

Appendix A: References

- Aa, E., Townsend, J.P., Adams, R.I., Nielsen, K.M., and Taylor, J.W. (2006) Population structure and gene evolution in *Saccharomyces cerevisiae*. *FEMS Yeast Research*, **6**, 702–715.
- Aaronson, R.P. and Blobel, G. (1974) On the attachment of the nuclear pore complex. *The Journal of Cell Biology*, **62**, 746–754.
- Abazeed, M.E. and Fuller, R.S. (2008) Yeast Golgi-localized, γ -Ear-containing, ADP-ribosylation factor-binding proteins are but adaptor protein-1 is not required for cell-free transport of membrane proteins from the trans-Golgi network to the prevacuolar compartment. *Molecular Biology of the Cell*, **19**, 4826–4836.
- Abbas-Terki, T., Donzé, O., Briand, P.A., and Picard, D. (2001) Hsp104 interacts with Hsp90 cochaperones in respiring yeast. *Molecular and Cellular Biology*, **21**, 7569–7575.
- Abbas-Terki, T., Briand, P.A., Donzé, O., and Picard, D. (2002) The Hsp90 co-chaperones Cdc37 and Sti1 interact physically and genetically. *Biological Chemistry*, **383**, 1335–1342.
- Abbott, D.A., Zelle, R.M., Pronk, J.T., and van Maris, A.J. (2009) Metabolic engineering of *Saccharomyces cerevisiae* for production of carboxylic acids: current status and challenges. *FEMS Yeast Research*, **9**, 1123–1136.
- Abelson, J., Trotta, C.R., and Li, H. (1998) tRNA splicing. *The Journal of Biological Chemistry*, **273**, 12685–12688 (review).
- Abelson, J.N. (1980) The organization of tRNA genes, in *Transfer RNA – Biological Aspects* (eds D. Söll, J.N. Abelson, and P.R. Schimmel), Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, pp. 211–220.
- Acharaya, U., Jacobs, R., Peters, J.M., Watson, M., Farquhar, M.G., and Malhotra, V. (1995) The formation of Golgi stacks from vesiculated Golgi membranes requires two distinct fusion events. *Cell*, **82**, 895–904.
- Achstetter, T., Emter, O., Ehmann, C., and Wolf, D.H. (1984) Proteolysis in eukaryotic cells. Identification of multiple proteolytic enzymes in yeast. *The Journal of Biological Chemistry*, **259**, 13334–13343.
- Achstetter, T., Franzusoff, A., Field, C., and Schekman, R. (1988) *SEC7* encodes an unusual, high molecular weight protein required for membrane traffic from the yeast Golgi apparatus. *The Journal of Biological Chemistry*, **263**, 11711–11717.
- Acker, J., Ozanne, C., Kachouri-Lafond, R., Gaillardin, C., Neuveglise, C., and Marck, C. (2008) Diccistronic tRNA–5S rRNA genes in *Yarrowia lipolytica*, an alternative TFIIIA-independent way for expression of 5S rRNA genes. *Nucleic Acids Research*, **36**, 5832–5844.
- Ackerman, S.H. and Tzagoloff, A. (2005) Function, structure, and biogenesis of mitochondrial ATP synthase. *Progress in Nucleic Acid Research and Molecular Biology*, **80**, 95–133 (review).
- Adam, A., Endres, M., Sirrenberg, C., Lottspeich, F., Neupert, W., and Brunner, M. (1999) Tim9, a new component of the TIM22.54 translocase in mitochondria. *The EMBO Journal*, **18**, 313–319.
- Adams, C.C. and Workman, J.L. (1993) Nucleosome displacement in transcription. *Cell*, **72**, 305–308 (review).
- Adams, S.E., Mellor, J., Gull, K. *et al.* (1987) The functions and relationships of Ty-VLP proteins in yeast reflect those of mammalian retroviral proteins. *Cell*, **49**, 111–119.
- Adams, M.D., Celniker, S.E., Holt, R.A. *et al.* (2000) The genome sequence of *Drosophila melanogaster*. *Science*, **287**, 2185–2195.
- Adler, S.P. and Nathans, D. (1973) Studies of SV 40 DNA. V. Conversion of circular to linear SV 40 DNA by restriction endonuclease from *Escherichia coli*. *Biochimica et Biophysica Acta*, **299**, 177–188.
- Agapakis, C.M. and Silver, P.A. (2009) Synthetic biology: exploring and exploiting genetic modularity through the design of novel biological networks. *Molecular BioSystems*, **5**, 704–713.
- Agne, B., Meindl, N.M., Niederhoff, K. *et al.* (2003) Pex8p: an intraperoxisomal organizer of the peroxisomal import machinery. *Molecular Cell*, **11**, 635–646.
- Aguilera, J., Randez-Gil, F., and Prieto, J.A. (2007) Cold response in *Saccharomyces cerevisiae*: new functions for old mechanisms. *FEMS Microbiology Reviews*, **31**, 327–341 (review).
- Ahmer, A. and Brodsky, J.L. (2004) Checkpoints in ER-associated degradation: excuse me, which way to the proteasome? *Trends in Cell Biology*, **14**, 474–478 (review).
- Ahn, S.H., Diaz, R.L., Grunstein, M., and Allis, C.D. (2006) Histone H2B deacetylation at lysine 11 is required for yeast apoptosis induced by phosphorylation of H2B at serine 10. *Molecular Cell*, **24**, 211–220.
- Aitchison, J.D., Blobel, G., and Rout, M.P. (1995) Nup120p: a yeast nucleoporin required for NPC distribution and mRNA transport. *The Journal of Cell Biology*, **131**, 1659–1675.
- Albanese, V., Yam, A.Y., Baughman, J., Parnot, C., and Frydman, J. (2006) Systems analyses reveal two chaperone networks with distinct functions in eukaryotic cells. *Cell*, **124**, 75–88.
- Alber, F., Dokudovskaya, S., Veenhoff, L.M. *et al.* (2007) The molecular architecture of the nuclear pore complex. *Nature*, **450**, 695–701.
- Albert, S., Will, E., and Gallwitz, D. (1999) Identification of the catalytic domains and their functionally critical arginine residues of two yeast GTPase-activating proteins specific for Ypt/Rab transport GTPases. *The EMBO Journal*, **18**, 5216–5215.
- Alberti, S., Gitler, A.D., and Lindquist, S. (2008) A suite of Gateway cloning vectors for high-throughput genetic analysis in *Saccharomyces cerevisiae*. *Yeast (Chichester, England)*, **24**, 913–919, http://www.addgene.org/yeast_gateway.
- Alberti, S., Halfmann, R., King, O., Kapila, A., and Lindquist, S. (2009) A systematic survey identifies prions and illuminates sequence features of prionogenic proteins. *Cell*, **137**, 146–158.
- Albertin, W., Marullo, P., Aigle, M. *et al.* (2009) Evidence for autotetraploidy associated with reproductive isolation in *Saccharomyces cerevisiae*, towards a new domesticated species. *Journal of Evolutionary Biology*, **22**, 2157–2170.
- Albrecht, R., Rehling, P., Chacinska, A. *et al.* (2006) The Tim21 binding domain connects the preprotein translocases of both mitochondrial membranes. *EMBO Reports*, **7**, 1233–1238.
- Alby, K., Schaefer, D., and Bennett, R.J. (2009) Homothallic and heterothallic mating in the opportunistic pathogen *Candida albicans*. *Nature*, **460**, 890–894.
- Alcasabas, A.A., Osborn, A.J., Bachant, J. *et al.* (2001) Mrc1 transduces signals of DNA replication stress to activate Rad53. *Nature Cell Biology*, **3**, 958–965.
- Al-Fageeh, M.B. and Smales, C.M. (2006) Control and regulation of the cellular responses to cold shock: the responses in yeast and mammalian systems. *The Biochemical Journal*, **397**, 247–259 (review).
- Allen, S., Balabanidou, V., Sideris, D.P., Lisowsky, T., and Tokatlidis, K. (2005) Erv1 mediates the Mia40-dependent protein import pathway and provides a functional link to the respiratory chain by shuttling electrons to cytochrome *c*. *Journal of Molecular Biology*, **353**, 937–944.
- Allfrey, V.G., Faulkner, R., and Mirsky, A.E. (1964) Acetylation and methylation of histones and their possible role in the regulation of RNA synthesis. *Proceedings of the National Academy of Sciences of the United States of America*, **51**, 786–794.

- Allis, C.D., Berger, S.L., Cote, J. *et al.* (2007) New nomenclature for chromatin-modifying enzymes. *Cell*, **131**, 633–636.
- Allmang, C., Kufel, J., Chanfreau, G., Mitchell, P., Petfalski, E., and Tollervey, D. (1999a) Functions of the exosome in rRNA, snoRNA and snRNA synthesis. *The EMBO Journal*, **18**, 5399–5410.
- Allmang, C., Petfalski, E., Podtelejnikov, A., Mann, M., Tollervey, D., and Mitchell, P. (1999b) The yeast exosome and human PM-ScI are related complexes of 3' → 5' exonucleases. *Genes and Development*, **13**, 2148–2158.
- Almagro, A., Prista, C., Benito, B., Loureiro-Dias, M.C., and Ramos, J. (2001) Cloning and expression of two genes coding for sodium pumps in the salt-tolerant yeast *Debaryomyces hansenii*. *Journal of Bacteriology*, **183**, 3251–3255.
- Almeida, J.R., Runquist, D., Sánchez i Nogué, V., Lidén, G., and Gorwa-Grauslund, M.F. (2011) Stress-related challenges in pentose fermentation to ethanol by the yeast *Saccharomyces cerevisiae*. *Journal of Biotechnology*, **6**, 286–299.
- Alper, H. and Stephanopoulos, G. (2009) Engineering for biofuels, exploiting innate microbial capacity or importing biosynthetic potential? *Nature Reviews Microbiology*, **7**, 715–723.
- Altman, S. (1975) Biosynthesis of transfer RNA in *Escherichia coli*. *Cell*, **4**, 21–29.
- Alvarez-Buylla, E.R., Pelaz, S., Liljegren, S.J. *et al.* (2000) An ancestral MADS-box gene duplication occurred before the divergence of plants and animals. *Proceedings of the National Academy of Sciences of the United States of America*, **97**, 5328–5333.
- Amar, N., Messenguy, F., El Bakkoury, M., and Dubois, E. (2000) ArgR1, a component of the ArgR–Mcm1 complex involved in the control of arginine metabolism in *Saccharomyces cerevisiae*, is the sensor of arginine. *Molecular and Cellular Biology*, **20**, 2087–2097.
- Amati, B.B. and Gasser, S.M. (1988) Chromosomal ARS and CEN elements bind specifically to the yeast nuclear scaffold. *Cell*, **54**, 967–978.
- Amberg, D.C., Zahner, J.E., Mulholland, J.W., Pringle, J.R., and Botstein, D. (1997) Aip3p/Bud6p, a yeast actin-interacting protein that is involved in morphogenesis and the selection of bipolar budding sites. *Molecular Biology of the Cell*, **8**, 729–733.
- Amon, A., Irniger, S., and Nasmyth, K. (1994) Closing the cell cycle circle in yeast: G₂ cyclin proteolysis initiated at mitosis persists until the activation of G₁ cyclins in the next cycle. *Cell*, **77**, 1037–1050.
- Amon, A. (1999) The spindle checkpoint. *Current Opinion in Genetics & Development*, **9**, 69–75.
- Amrani, N., Sachs, M.S., and Jacobson, A. (2006) Early nonsense: mRNA decay solves a translational problem. *Nature Reviews Molecular Cell Biology*, **7**, 415–425.
- Andalis, A.A., Storchova, Z., Styles, C. *et al.* (2004) Defects arising from whole-genome duplication in *Saccharomyces cerevisiae*. *Genetics*, **167**, 1109–1121.
- Anders, A., Lilie, H., Franke, K. *et al.* (2006) The galactose switch in *Kluyveromyces lactis* depends on nuclear competition between Gal4 and Gal1 for Gal80 binding. *The Journal of Biological Chemistry*, **281**, 29337–29348.
- Andersen, J.S. and Mann, M. (2000) Functional genomics by mass spectrometry. *FEBS Letters*, **480**, 25–31.
- Andersen, G., Merico, A., Bjornberg, O. *et al.* (2006) Catabolism of pyrimidines in yeast. A tool to understand degradation of anticancer drugs. *Nucleosides Nucleotides and Nucleic Acids*, **25**, 991–996.
- Andersen, G., Bjoernberg, O., Polakova, S. *et al.* (2008a) A second pathway to degrade pyrimidine nucleic acid precursors in eukaryotes. *Journal of Molecular Biology*, **380**, 656–666.
- Andersen, M.P., Nelson, Z.W., Hetrick, E.D., and Gottschling, D.E. (2008b) A genetic screen for increased loss of heterozygosity in *Saccharomyces cerevisiae*. *Genetics*, **179**, 1179–119.
- Andersen, P.L., Xu, F., and Xiao, W. (2008c) Eukaryotic DNA damage tolerance and translesion synthesis through covalent modifications of PCNA. *Cell Research*, **18**, 162–173.
- Anderson, J.S. and Parker, R.P. (1998) The 3' to 5' degradation of yeast mRNAs is a general mechanism for mRNA turnover that requires the SKI2 DEVH box protein and 3' to 5' exonucleases of the exosome complex. *The EMBO Journal*, **17**, 1497–1506.
- Anderson, S., Bankier, A.T., Barrell, B.G. *et al.* (1981) Sequence and organization of the human mitochondrial genome. *Nature*, **290**, 457–465.
- Anderson, J., Phan, L., and Hinnebusch, A.G. (2000) The Gcd10p/Gcd14p complex is the essential two-subunit tRNA(1-methyladenosine) methyltransferase of *Saccharomyces cerevisiae*. *Proceedings of the National Academy of Sciences of the United States of America*, **97**, 5173–5178.
- Anderson, D.E., Losada, A., Erickson, H.P., and Hirano, T. (2002) Condensin and cohesin display different arm conformations with characteristic hinge angles. *The Journal of Cell Biology*, **156**, 419–424.
- Andress, E.J., Holic, R., Edelmann, M.J., Kessler, B.M., and Yu, V.P. (2011) Dia2 controls transcription by mediating assembly of the RSC complex. *PLoS One*, **6**, e21172.
- Anraku, Y., Umemoto, N., Hirata, R., and Wada, Y. (1989) Structure and function of the yeast vacuolar membrane proton ATPase. *Journal of Bioenergetics and Biomembranes*, **21**, 589–603 (review).
- Antebi, A. and Fink, G.R. (1992) The yeast Ca²⁺-ATPase homologue, *PMR1*, is required for normal Golgi function and localizes in a novel Golgi-like distribution. *Molecular Biology of the Cell*, **3**, 633–654.
- Antony, E., Tomko, E.J., Xiao, Q., Krejci, L., Lohman, T.M., and Ellenberger, T. (2009) Srs2 disassembles Rad51 filaments by a protein–protein interaction triggering ATP turnover and dissociation of Rad51 from DNA. *Molecular Cell*, **35**, 105–115.
- Anttonen, A.K., Mahjneh, I., Hamalainen, R.H. *et al.* (2005) The gene disrupted in Marinesco–Sjogren syndrome encodes SIL1, an HSPA5 cochaperone. *Nature Genetics*, **37**, 1309–1311.
- Apanovitch, D.M., Slep, K.C., Sigler, P.B., and Dohlman, H.G. (1998) Sst2 is a GTPase-activating protein for Gpa1: purification and characterization of a cognate RGS-Galpha protein pair in yeast. *Biochemistry*, **37**, 4815–4822.
- Aparicio, O.M., Weinstein, D.M., and Bell, S.P. (1997) Components and dynamics of DNA replication complexes in *S. cerevisiae*: redistribution of MCM complexes and Cdc45p during S phase. *Cell*, **91**, 59–69.
- Apone, L.M., Virbasius, C.A., Holstege, F.C., Wang, J., Young, R.A., and Green, M.R. (1998) Broad, but not universal, transcriptional requirement for yTAFII17, a histone H3-like TAFII present in TFIID and SAGA. *Molecular Cell*, **2**, 653–661.
- Aquilanti, L., Santarelli, S., Silvestri, G., Osimani, A., Petruzzelli, A., and Clementi, F. (2007) The microbial ecology of a typical Italian salami during its natural fermentation. *International Journal of Food Microbiology*, **120**, 136–145.
- Arabidopsis* Genome Initiative (2000) Analysis of the genome sequence of the flowering plant *Arabidopsis thaliana*. *Nature*, **408**, 796–815.
- Araki, H., Jearnpipatkul, A., Tasumi, H. *et al.* (1985) Molecular and functional organization of yeast plasmid pSR1. *Journal of Molecular Biology*, **20**, 191–203.
- Araki, H. (2010) Regulatory mechanism of the initiation step of DNA replication by CDK in budding yeast. *Biochimica et Biophysica Acta*, **1804**, 520–523.
- Aranda, A. and Proudfoot, N. (2001) Transcriptional termination factors for RNA polymerase II in yeast. *Molecular Cell*, **7**, 1003–1011.
- Arava, Y., Wang, Y., Storey, J.D., Liu, C.L., Brown, P.O., and Herschlag, D. (2003) Genome-wide analysis of mRNA translation profiles in *Saccharomyces cerevisiae*. *Proceedings of the National Academy of Sciences of the United States of America*, **100**, 3889–3894.
- Araya, C.L., Payen, C., Dunham, M.J., and Fields, S. (2010) Whole-genome sequencing of a laboratory-evolved yeast strain. *BMC Genomics*, **11**, 88.
- Arber, W. (1965) Host-controlled modification of bacteriophage. *Annual Review of Microbiology*, **19**, 365–378 (review).
- Arber, W. (1978) Restriction endonucleases. *Angewandte Chemie (International Edition in English)*, **17**, 73–79 (review).
- Ardell, D.H. (2010) Computational analysis of tRNA identity. *FEBS Letters*, **584**, 325–333.
- Ardiani, A., Higgins, J.P., and Hodge, J.W. (2010) Vaccines based on whole recombinant *Saccharomyces cerevisiae* cells. *FEMS Yeast Research*, **10**, 1060–1069 (review).
- Argueso, J.L., Carazzolle, M.F., Mieczkowski, P. A. *et al.* (2009) Genome structure of a *Saccharomyces cerevisiae* strain widely used in bioethanol production. *Genome Research*, **19**, 2258–2270.
- Arlt, A., Tauer, R., Feldmann, H., Neupert, W., and Langer, T. (1996) The AAA protease complex, a novel ATP-dependent complex in the inner membrane of mitochondria with proteolytic and chaperone-like activities. *Cell*, **85**, 875–885.
- Arnez, J.G. and Moras, D. (1997) Structural and functional considerations of the aminoacylation reaction. *Trends in Biochemical Sciences*, **22**, 211–216.
- Arnold, I. and Langer, T. (2002) Membrane protein degradation by AAA proteases in

- mitochondria. *Biochimica et Biophysica Acta*, **1592**, 89–96.
- Arnold, I., Bauer, M.F., Brunner, M., Neupert, W., and Stuart, R.A. (1997) Yeast mitochondrial F_1F_0 -ATPase: the novel subunit e is identical to Tim11. *FEBS Letters*, **411**, 195–200.
- Arnold, I., Wagner-Ecker, M., Ansoerge, W., and Langer, T. (2006) Evidence for a novel mitochondria-to-nucleus signalling pathway in respiring cells lacking i-AAA protease and the ABC-transporter Mdl1. *Genetics*, **36**, 74–88.
- Arnold, W.N. (1991) Periplasmic space, in *The Yeasts*, 2nd edn, vol. 4, Yeast Organelles (eds A.H. Rose and J.S. Harrison), Academic Press, London, pp. 279–295.
- Aronheim, A., Engelberg, D., Li, N., al-Alawi, N., Schlessinger, J., and Karin, M. (1994) Membrane targeting of the nucleotide exchange factor Sos is sufficient for activating the Ras signaling pathway. *Cell*, **78**, 949–961.
- Aronova, S., Wedaman, K., Anderson, S., Yates, J.3rd, and Powers, T. (2007) Probing the membrane environment of the TOR kinases reveals functional interactions between TORC1, actin, and membrane trafficking in *Saccharomyces cerevisiae*. *Molecular Biology of the Cell*, **18**, 2779–2794.
- Artiguenave, F., Wincker, P., Brottier, P., Duprat, S., Jovelin, F., Scarpelli, C., Verdier, J., Vico, V., Weissenbach, J. and Saurin, W. (2000) Genomic exploration of the hemiascomycetous yeasts: 2. Data generation and processing. *FEBS Letters*, **487**, 13–16.
- Arts, G.J., Kuersten, S., Romby, P., Ehresmann, B., and Mattaj, I.W. (1998) The role of exportin-t in selective nuclear export of mature tRNAs. *The EMBO Journal*, **17**, 7430–7441.
- Arumugam, P., Nishino, T., Haering, C.H., Gruber, S., and Nasmith, K. (2006) Cohesin's ATPase activity is stimulated by the C-terminal winged-helix domain of its kleisin subunit. *Current Biology*, **16**, 1998–2008.
- Arvas, M., Kivioja, T., Mitchell, A. et al. (2007) Comparison of protein coding gene contents of the fungal phyla Pezizomycotina and Saccharomycotina. *BMC Genomics*, **8**, 325.
- Arya, G., Maitra, A., and Grigoryev, S.A. (2010) A structural perspective on the where, how, why, and what of nucleosome positioning. *Journal of Biomolecular Structure & Dynamics*, **27**, 803–820.
- Asano, K. and Hinnebusch, A.G. (2001) Protein interactions important in eukaryotic translation initiation. *Methods in Molecular Biology (Clifton, NJ)*, **177**, 179–198.
- Asano, K., Phan, L., Anderson, J., and Hinnebusch, A.G. (1998) Complex formation by all five homologues of mammalian translation initiation factor 3 subunits from yeast *Saccharomyces cerevisiae*. *The Journal of Biological Chemistry*, **273**, 18573–18585.
- Asano, K., Clayton, J., Shalev, A., and Hinnebusch, A.G. (2000) A multifactor complex of eukaryotic initiation factors, eIF1, eIF2, eIF3, eIF5, and initiator tRNA^{Met} is an important translation initiation intermediate *in vivo*. *Genes and Development*, **14**, 2534–2546.
- Asano, K., Phan, L., Valasek, L. et al. (2001) A multifactor complex of eIF1, eIF2, eIF3, eIF5, and tRNA^{Met} promotes initiation complex assembly and couples GTP hydrolysis to AUG recognition. *Cold Spring Harbor Symposia on Quantitative Biology*, **266**, 403–415 (review).
- Asano, K., Phan, L., Krishnamoorthy, T. et al. (2002) Analysis and reconstitution of translation initiation *in vitro*. *Methods in Enzymology*, **351**, 221–247 (review).
- Asher, E.B., Groudinsky, O., Dujardin, G., Altamura, N., Kermorgant, M., and Slonimski, P.P. (1989) Novel class of nuclear genes involved in both mRNA splicing and protein synthesis in *Saccharomyces cerevisiae* mitochondria. *Molecular & General Genetics*, **215**, 517–528.
- Ashrafi, K., Sinclair, D., Gordon, J.I., and Guarente, L. (1999) Passage through stationary phase advances replicative aging in *Saccharomyces cerevisiae*. *Proceedings of the National Academy of Sciences of the United States of America*, **96**, 9100–9105.
- Asturias, F.J., Jiang, Y.W., Myers, L.C., Gustafsson, C.M., and Kornberg, R.D. (1999) Conserved structures of mediator and RNA polymerase II holoenzyme. *Science*, **283**, 985–987.
- Asturias, F.J., Ezeokkonkwo, C., Kornberg, R.D., and Lorch, Y. (2004) Electron microscopic analysis of the RSC chromatin remodeling complex. *Methods in Enzymology*, **376**, 48–62 (review).
- Athenstaedt, K., Jolivet, P., Boulard, C. et al. (2006) Lipid particle composition of the yeast *Yarrowia lipolytica* depends on the carbon source. *Proteomics*, **6**, 1450–1459.
- Atorino, L., Silvestri, L., Koppen, M. et al. (2003) Loss of m-AAA protease in mitochondria causes complex I deficiency and increased sensitivity to oxidative stress in hereditary spastic paraplegia. *The Journal of Cell Biology*, **163**, 777–787.
- Auble, D.T., Wang, D., Post, K.W., and Hahn, S. (1997) Molecular analysis of the SNF2/SWI2 protein family member MOT1, an ATP-driven enzyme that dissociates TATA-binding protein from DNA. *Molecular and Cellular Biology*, **17**, 4842–4851.
- Audhya, A. and Emr, S.D. (2002) Stt4 PI 4-kinase localizes to the plasma membrane and functions in the Pkc1-mediated MAP kinase cascade. *Developmental Cell*, **2**, 593–605.
- Audhya, A., Foti, M., and Emr, S.D. (2000) Distinct roles for the yeast phosphatidylinositol 4-kinases, Stt4p and Pik1p, in secretion, cell growth, and organelle membrane dynamics. *Molecular Biology of the Cell*, **11**, 2673–2689.
- Audhya, A., Loewith, R., Parsons, A.B. et al. (2004) Genome-wide lethality screen identifies new P14, 5P2 effectors that regulate the actin cytoskeleton. *The EMBO Journal*, **23**, 3747–3757.
- Audrey, D., Gasch, P., Spellman, P.T. et al. (2000) Genomic expression programs in the response of yeast cells to environmental changes. *Molecular Biology of the Cell*, **11**, 4241–4257.
- Augustin, S., Nolden, M., Muller, S., Hardt, O., Arnold, I., and Langer, T. (2005) Characterization of peptides released from mitochondria: evidence for constant proteolysis and peptide efflux. *The Journal of Biological Chemistry*, **280**, 2691–2699.
- Avila, J., Gonzalez, C., Brito, N., Machin, F., Perez, M.D., and Siverio, J.M. (2002) A second Zn(II)₂Cys₆ transcriptional factor encoded by the YNA2 gene is indispensable for the transcriptional activation of the genes involved in nitrate assimilation in the yeast *Hansenula polymorpha*. *Yeast (Chichester, England)*, **19**, 537–544.
- Aye, M., Dildine, S.L., Claypool, J.A., Jourdain, S., and Sandmeyer, S.B. (2001) A truncation mutant of the 95-kilodalton subunit of transcription factor IIIC reveals asymmetry in Ty3 integration. *Molecular and Cellular Biology*, **21**, 7839–7851.
- Azevedo, D., Nascimento, L., Labarre, J., Toledano, M.B., and Rodrigues-Pousada, C. (2007) The *S. cerevisiae* Yap1 and Yap2 transcription factors share a common cadmium-sensing domain. *FEBS Letters*, **581**, 187–195.
- Azmi, I., Davies, B., Dimaano, C. et al. (2006) Recycling of ESCRTs by the AAA-ATPase Vps4 is regulated by a conserved VSL region in Vta1. *The Journal of Cell Biology*, **172**, 705–717.
- Azvolinsky, A., Dunaway, S., Torres, J.Z., Bessler, J.B., and Zakian, V.A. (2006) The *S. cerevisiae* Rrm3p DNA helicase moves with the replication fork and affects replication of all yeast chromosomes. *Genes and Development*, **20**, 3104–3116.
- Babcock, M., deSilva, D., Oaks, R. et al. (1997) Regulation of mitochondrial iron accumulation by Yfh1p, a putative homolog of frataxin. *Science*, **276**, 1709–1712.
- Babst, M., Sato, T.K., Banta, L.M., and Emr, S.D. (1997) Endosomal transport function in yeast requires a novel AAA-type ATPase, Vps4p. *The EMBO Journal*, **16**, 1820–1831.
- Babst, M., Wendland, B., Estepa, E.J., and Emr, S.D. (1998) The Vps4p AAA ATPase regulates membrane association of a Vps protein complex required for normal endosome function. *The EMBO Journal*, **17**, 2982–2993.
- Babst, M., Katzmman, D., Estepa-Sabal, E., Meerloo, T., and Emr, S. (2002a) ESCRT-III: an endosome-associated heterooligomeric protein complex required for MVB sort. *Developmental Cell*, **3**, 271.
- Babst, M., Katzmman, D., Snyder, W., Wendland, B., and Emr, S. (2002b) Endosome-associated complex, ESCRT-II, recruits transport machinery for protein sorting at the multivesicular body. *Developmental Cell*, **3**, 283.
- Babst, M. (2005) A proteins final ESCR. *Traffic (Copenhagen, Denmark)*, **6**, 2–9.
- Babu, M., Krogan, N.J., Awrey, D.E., Emili, A., and Greenblatt, J.F. (2009) Systematic characterization of the protein interaction network and protein complexes in *Saccharomyces cerevisiae* using tandem affinity purification and mass spectrometry. *Methods in Molecular Biology (Clifton, NJ)*, **548**, 187–207.
- Bachmair, A., Finley, D., and Varshavsky, A. (1986) *In vivo* half-life of a protein is a function of its amino-terminal residue. *Science*, **234**, 179–186.
- Bachman, N., Eby, Y., and Boeke, J.D. (2004) Local definition of Ty1 target preference by long terminal repeats and clustered tRNA genes. *Genome Research*, **1**, 1232–1247.
- Bachman, N., Gelbart, M.E., Tsukiyama, T., and Boeke, J.D. (2005) TFIIB subunit Bdp1p is required for periodic integration of the Ty1

- retrotransposon and targeting of Isw2p to *S. cerevisiae* tDNAs. *Genes and Development*, **19**, 955–964.
- Backhaus, K., Buchwald, U., Heppeler, N., Schmitz, H.P., Rodicio, R., and Heinisch, J.J. (2011) Milk and sugar, regulation of cell wall synthesis in the milk yeast *Kluyveromyces lactis*. *European Journal of Cell Biology*, **90**, 745–750.
- Badis, G., Chan, E.T., van Bakel, H. *et al.* (2008) A new library of yeast transcription factor motifs reveals a widespread function for Rsc3 in targeting nucleosome exclusion at promoters. *Molecular Cell*, **32**, 878–887.
- Baganz, F., Hayes, A., Farquhar, R., Butler, P.R., Gardner, D.C., and Oliver, S.G. (1998) Comprehensive functional analysis by transcript profiling, 2D gels, MS in proteomics at steady-state levels. *Yeast (Chichester, England)*, **14**, 1417–1427.
- Baggett, J.J., Shaw, J.D., Sciambi, C.J., Watson, H.A., and Wendland, B. (2003) Fluorescent labeling of yeast. *Current Protocols in Cell Biology*, Chapter 4, Unit 4.13.
- Bagriantsev, S. and Liebman, S.W. (2004) Specificity of prion assembly *in vivo*: [PSI⁺] and [PIN⁺] form separate structures in yeast. *The Journal of Biological Chemistry*, **279**, 51042–51048.
- Bai, C., Sen, P., Hofman, K. *et al.* (1996) SKP1 connects cell cycle regulators to the ubiquitin proteolysis machinery through a novel motif, the F-box. *Cell*, **86**, 263–274.
- Bailey, J.E. (1991) Toward a science of metabolic engineering. *Science*, **252**, 1668–1675 (review).
- Baker, R.E., Eigel, A., Vögtel, D., and Feldmann, H. (1982) Nucleotide sequences of yeast genes for tRNA(Ser2), tRNA(Arg2) and tRNA(Val1): homology blocks occur in the vicinity of different tRNA genes. *The EMBO Journal*, **1**, 291–295.
- Baker, D., Hicke, L., Rexach, M., Schleyer, M., and Schekman, R. (1988) Reconstitution of SEC gene product-dependent intercompartmental protein transport. *Cell*, **54**, 335–344.
- Baker, K.P., Schaniel, A., Vestweber, D., and Schatz, G. (1990) A yeast mitochondrial outer membrane protein essential for protein import and cell viability. *Nature*, **348**, 605–609.
- Baker, R.T., Tobias, J.W., and Varshavsky, A. (1992) Ubiquitin-specific proteases of *Saccharomyces cerevisiae*. Cloning of *UBP2* and *UBP3*, and functional analysis of the UBP gene family. *The Journal of Biological Chemistry*, **267**, 23364–23375.
- Baker, C.R., Tuch, B.B., and Johnson, A.D. (2011) Extensive DNA-binding specificity divergence of a conserved transcription regulator. *Proceedings of the National Academy of Sciences of the United States of America*, **108**, 7493–7498.
- Balaban, R.S., Nemoto, S., and Finkel, T. (2005) Mitochondria, oxidants, and aging. *Cell*, **120**, 483–495.
- Balakrishnan, L., Polaczek, P., Pokharel, S., Campbell, J.L., and Bambara, R.A. (2010) Dna2 exhibits a unique strand end-dependent helicase function. *The Journal of Biological Chemistry*, **285**, 38861–38868.
- Baldacci, G. and Bernardi, G. (1982) Replication origins are associated with transcription initiation sequences in the mitochondrial genome of yeast. *The EMBO Journal*, **1**, 987–994.
- Baldwin, E.L., Berger, A.C., Corbett, A.H., and Osheroff, N. (2005) Mms22p protects *Saccharomyces cerevisiae* from DNA damage induced by topoisomerase II. *Nucleic Acids Research*, **33**, 1021–1030.
- Balk, J., Pierik, A.J., Netz, D.J., Muhlenhoff, U., and Lill, R. (2004) The hydrogenase-like Nar1p is essential for maturation of cytosolic and nuclear iron–sulfur proteins. *The EMBO Journal*, **23**, 2105–2115.
- Balk, J., Aguilar Netz, D.J., Tepper, K., Pierik, A.J., and Lill, R. (2005) The essential WD40 protein Cia1 is involved in a late step of cytosolic and nuclear iron–sulfur protein assembly. *Molecular and Cellular Biology*, **25**, 10833–10841.
- Balzi, E. and Goffeau, A. (1991) Multiple or pleiotropic drug resistance in yeast. *Biochimica et Biophysica Acta*, **1073**, 241–252 (review).
- Balzi, E., Chen, W., Ulaszewski, S., Capieaux, E., and Goffeau, A. (1987) The multidrug resistance gene *PDR1* from *Saccharomyces cerevisiae*. *The Journal of Biological Chemistry*, **262**, 16871–16879.
- Bandy, B. and Davison, A.J. (1990) Mitochondrial mutations may increase oxidative stress: implications for carcinogenesis and aging? *Free Radical Biology & Medicine*, **8**, 523–539.
- Banerjee, N. and Zhang, M.Q. (2002) Functional genomics as applied to mapping transcription regulatory networks. *Current Opinion in Microbiology*, **5**, 313–317.
- Banerjee, D., Lelandais, G., Shukla, S. *et al.* (2008) Responses of pathogenic and nonpathogenic yeast species to steroids reveal the functioning and evolution of multidrug resistance transcriptional networks. *Eukaryotic Cell*, **7**, 68–77.
- Bao, W.G., Guiard, B., Fang, Z.A. *et al.* (2008) Oxygen-dependent transcriptional regulator Hap1p limits glucose uptake by repressing the expression of the major glucose transporter gene *RAG1* in *Kluyveromyces lactis*. *Eukaryotic Cell*, **7**, 1895–1905.
- Barabino, S.M. and Keller, W. (1999) Last but not least: regulated poly(A) tail formation. *Cell*, **99**, 9–11 (review).
- Barberis, A., Muller, C.W., Harrison, S.C., and Ptashne, M. (1993) Delineation of two functional regions of transcription factor TFIIB. *Proceedings of the National Academy of Sciences of the United States of America*, **90**, 5628–5632.
- Bardwell, L. (2005) A walk-through of the yeast mating pheromone response pathway. *Peptides*, **26**, 339–350.
- Barlowe, C., d'Enfert, C., and Schekman, R. (1993) Purification and characterization of Sar1p, a small GTP-binding protein required for transport vesicle formation from the endoplasmic reticulum. *The Journal of Biological Chemistry*, **268**, 873–879.
- Barlowe, C., Orci, L., Yeung, T. *et al.* (1994) COPII: a membrane coat formed by Sec proteins that drive vesicle budding from the endoplasmic reticulum. *Cell*, **77**, 895–907.
- Barnes, G., Louie, K.A., and Botstein, D. (1992) Yeast proteins associated with microtubules *in vitro* and *in vivo*. *Molecular Biology of the Cell*, **3**, 29–47.
- Barnett, J.A. (2003) Beginnings of microbiology and biochemistry: the contribution of yeast research. *Microbiology (Reading, England)*, **149**, 557–567 (review).
- Barral, Y., Parra, M., Bidlingmaier, S., and Snyder, M. (1999) Nim1-related kinases coordinate cell cycle progression with the organization of the peripheral cytoskeleton in yeast. *Genes and Development*, **13**, 176–187.
- Barral, Y., Mermall, V., Mooseker, M.S., and Snyder, M. (2000) Compartmentalization of the cell cortex by septins is required for maintenance of cell polarity in yeast. *Molecular Cell*, **5**, 841–851.
- Barrass, J.D. and Beggs, J.D. (2003) Splicing goes global. *Trends in Genetics*, **19**, 295–298.
- Barraud, P., Schmitt, T., Mechulam, Y., Dardel, Y., and Tisné, C. (2008) A unique conformation of the anticodon stem–loop is associated with the capacity of tRNA^{fMet} to initiate protein synthesis. *Nucleic Acid Research*, **36**, 4894–4901.
- Barrell, B.G., Bankier, A.T., and Drouin, J. (1979) A different genetic code in human mitochondria. *Nature*, **282**, 189–194.
- Barrowman, J., Bhandari, D., Reinisch, K., and Ferro-Novick, S. (2010) TRAPP complexes in membrane traffic: convergence through a common Rab. *Nature Reviews Molecular Cell Biology*, **11**, 759–763.
- Barsoum, E., Martinez, P., and Aström, S.U. (2010) Alpha3, a transposable element that promotes host sexual reproduction. *Genes and Development*, **24**, 33–44.
- Bartel, B., Wunning, I., and Varshavsky, A. (1990) The recognition component of the N-end rule pathway. *The EMBO Journal*, **9**, 3179–3189.
- Barth, G. and Gaillardin, C. (1996) *Yarrowia lipolytica*, in *Non Conventional Yeasts in Biotechnology* (ed. K. Wolf), Springer, Berlin, pp. 313–388.
- Barth, G. and Gaillardin, C. (1997) Physiology and genetics of the dimorphic fungus *Yarrowia lipolytica*. *FEMS Microbiology Reviews*, **19**, 219–237.
- Barth, G., Beckerich, J.M., Dominguez, A. *et al.* (2003) Functional genetics of *Yarrowia lipolytica*, in *Functional Genetics of Industrial Yeasts*, vol. 2/2003 (ed. J.H. de Winde), Springer, Berlin, pp. 227–271.
- Bartholomew, B., Kassavetis, G.A., and Geiduschek, E.P. (1991) Two components of *Saccharomyces cerevisiae* transcription factor IIIB (TFIIIB) are stereospecifically located upstream of a tRNA gene and interact with the second-largest subunit of TFIIC. *Molecular and Cellular Biology*, **11**, 5181–5189.
- Bartholomew, B., Durkovich, D., Kassavetis, G.A., and Geiduschek, E.P. (1993) Orientation and topography of RNA polymerase III in transcription complexes. *Molecular and Cellular Biology*, **13**, 942–952.
- Baruffini, E., Lodi, T., Dallabona, C., Puglisi, A., Zeviani, M., and Ferrero, I. (2006) Genetic and chemical rescue of the *Saccharomyces cerevisiae* phenotype induced by mitochondrial DNA polymerase mutations associated with progressive external ophthalmoplegia in humans. *Human Molecular Genetics*, **15**, 2846–2855.
- Basavappa, R. and Sigler, P.B. (1991) The 3 Å crystal structure of yeast initiator tRNA:

- functional implications in initiator/elongator discrimination. *The EMBO Journal*, **10**, 3105–3111.
- Bash, R. and Lohr, D. (2001) Yeast chromatin structure and regulation of GAL gene expression. *Progress in Nucleic Acid Research and Molecular Biology*, **65**, 197–259 (review).
- Bash, R.C., Vargason, J.M., Cornejo, S., Ho, P. S., and Lohr, D. (2001) Intrinsically bent DNA in the promoter regions of the yeast *GAL1-10* and *GAL80* genes. *The Journal of Biological Chemistry*, **276**, 861–866.
- Basrai, M.A. and Hieter, P. (1995) Is there a unique form of chromatin at the *Saccharomyces cerevisiae* centromeres? *Bioessays*, **17**, 669–672 (review).
- Bassett, D.E., Boguski, M.S., and Hieter, P. (1996) Yeast genes and human disease. *Nature*, **379**, 589–590.
- Bassler, J., Grandi, P., Gadal, O. *et al.* (2001) Identification of a 60S pre-ribosomal particle that is closely linked to nuclear export. *Molecular Cell*, **8**, 517–529.
- Bastin-Shanower, S.A., Fricke, W.M., Mullen, J.R., and Brill, S.J. (2003) The mechanism of Mus81–Mms4 cleavage site selection distinguishes it from the homologous endonuclease Rad1–Rad10. *Molecular and Cellular Biology*, **23**, 3487–3496.
- Batada, N.N., Westover, K.D., Bushnell, D.A., Levitt, M., and Kornberg, R.D. (2004) Diffusion of nucleoside triphosphates and role of the entry site to the RNA polymerase II active center. *Proceedings of the National Academy of Sciences of the United States of America*, **101**, 17361–17364.
- Bauer, M.F., Sirrenberg, C., Neupert, W., and Brunner, M. (1996a) Role of Tim23 as voltage sensor and presequence receptor in protein import into mitochondria. *Cell*, **87**, 33–41.
- Bauer, V.W., Swaffield, J.C., Johnston, S.A., and Andrews, M.T. (1996b) CADp44: a novel regulatory subunit of the 26S proteasome and the mammalian homolog of yeast Sug2p. *Genetics*, **181**, 63–69.
- Baumann, K., Carnicer, M., Dragosits, M. *et al.* (2010) A multi-level study of recombinant *Pichia pastoris* in different oxygen conditions. *BMC Systems Biology*, **4**, 141.
- Baumann, K., Dato, L., Graf, A.B. *et al.* (2011) The impact of oxygen on the transcriptome of recombinant *S. cerevisiae* and *P. pastoris* – a comparative analysis. *BMC Genomics*, **12**, 218.
- Baumeister, W. and Lupas, A. (1997) The proteasome. *Current Opinion in Structural Biology*, **7**, 273–278 (review).
- Baumeister, W., Cejka, Z., Kania, M., and Seemüller, E. (1997) The proteasome: a macromolecular assembly designed to confine proteolysis to a nanocompartment. *Biological Chemistry*, **378**, 121–130 (review).
- Baumeister, W., Bachmair, A., Chau, V. *et al.* (2004) Varshavsky's contributions. *Science*, **306**, 1290–1292.
- Bays, N.W., Gardener, R.G., Seelig, L.P., Joazeiro, C.A., and Hampton, R.Y. (2001a) Hdr1/Der3 is a membrane-anchored ubiquitin ligase for ER-associated degradation. *Nature Cell Biology*, **3**, 24–29.
- Bays, N.W., Wilhovskiy, S.K., Goradia, A., Hodgkiss-Harlow, K., and Hampton, R.Y. (2001b) *HDR4/NPL4* is required for the proteasomal processing of ubiquitinated ER proteins. *Molecular Biology of the Cell*, **12**, 4114–4128.
- Beach, D.L. and Bloom, K. (2001) ASH1 mRNA localization in three acts. *Molecular Biology of the Cell*, **12**, 2567–2577.
- Beach, D., Durkacz, B., and Nurse, P. (1982) Functionally homologous cell cycle control genes in budding and fission yeast. *Nature*, **300**, 706–709.
- Beck, T. and Hall, M.N. (1999) The TOR signalling pathway controls nuclear localization of nutrient-regulated transcription factors. *Nature*, **402**, 689–692.
- Beck, H., Dobritzsch, D., and Piskur, J. (2008) *Saccharomyces kluyveri* as a model organism to study pyrimidine degradation. *FEMS Yeast Research*, **8**, 1209–1213.
- Beck, R., Rawet, M., Wieland, F.T., and Cassel, D. (2009) The COPI system: molecular mechanisms and function. *FEBS Letters*, **583**, 2709.
- Beck, R., Rawet, M., Wieland, F.T., and Cassel, D. (2009) The COPI system: molecular mechanisms and function. *FEBS Letters*, **583**, 2709.
- Becker, P.B. and Hörz, W. (2002) ATP-dependent nucleosome remodeling. *Annual Review of Biochemistry*, **71**, 247–273 (review).
- Becker, J., Tan, T.J., Trepte, H.H., and Gallwitz, D. (1991) Mutational analysis of the putative effector domain of the GTP-binding Ypt1 protein in yeast suggests specific regulation by a novel GAP activity. *The EMBO Journal*, **10**, 785–792.
- Becksei, A. and Mattaj, I.W. (2005) Quantitative models of nuclear transport. *Current Opinion in Cell Biology*, **17**, 27–34.
- Bednarek, S.Y., Ravazzola, M., Hosobuchi, M. *et al.* (1995) COPI- and COPII-coated vesicles bud directly from the endoplasmic reticulum in yeast. *Cell*, **83**, 1183–1196.
- Beekwilder, J., Wolswinkel, R., Jonker, H., Hall, R., de Vos, C.H., and Bovy, A. (2006) Production of resveratrol in recombinant microorganisms. *Applied and Environmental Microbiology*, **72**, 5670–5672.
- Beggs, J.D. (1978) Transformation of yeast by a replicating hybrid plasmid. *Nature*, **275**, 104–109.
- Behm-Ansmant, I., Kashima, I., Rehwinkel, J., Sauliere, J., Wittkopp, N., and Izaurralde, E. (2007) mRNA quality control: an ancient machinery recognizes and degrades mRNAs with nonsense codons. *FEBS Letters*, **581**, 2845–2853.
- Bekri, S., Kispal, G., Lange, H. *et al.* (2000) Human ABC7 transporter: gene structure and mutation causing X-linked sideroblastic anemia with ataxia with disruption of cytosolic iron–sulfur protein maturation. *Blood*, **96**, 3256–3264.
- Belazzi, T., Wagner, A., Wieser, R. *et al.* (1991) Negative regulation of transcription of the *Saccharomyces cerevisiae* catalase T (*CTT1*) gene by cAMP is mediated by a positive control element. *The EMBO Journal*, **10**, 585–592.
- Belcourt, M.F. and Farabaugh, P.J. (1990) Ribosomal frameshifting in the yeast retrotransposon Ty: tRNAs induce slippage on a 7 nucleotide minimal site. *Cell*, **62**, 339–352.
- Belfort, M. and Perlman, P.S. (1995) Mechanisms of intron mobility. *The Journal of Biological Chemistry*, **270**, 30237–30240.
- Belgareh-Touze, N., Avaro, S., Rouille, Y., Hoflack, B., and Haguenaer-Tsapis, R. (2002) Yeast Vps5p, a functional homolog of human obesity receptor gene-related protein, is involved in late endosome to vacuole trafficking. *Molecular Biology of the Cell*, **13**, 1694–1708.
- Belgareh-Touze, N., Corral-Debrinski, M., Launhardt, H. *et al.* (2003) Yeast functional analysis: identification of two essential genes involved in ER to Golgi trafficking. *Traffic (Copenhagen, Denmark)*, **4**, 607–617.
- Bell, S.P., Kobayashi, R., and Stillman, B. (1993) Yeast origin recognition complex functions in transcription silencing and DNA replication. *Science*, **262**, 1844–1849.
- Bell, S.P., Mitchell, J., Leber, J., Kobayashi, R., and Stillman, B. (1995) The multidomain structure of Orc1p reveals similarity to regulators of DNA replication and transcriptional silencing. *Cell*, **83**, 563–568.
- Belloch, C., Perez-Torrado, R., Gonzalez, S.S. *et al.* (2009) Chimeric genomes of natural hybrids between *Saccharomyces cerevisiae* and *Saccharomyces kudriavzevii*. *Applied and Environmental Microbiology*, **75**, 2534–2544.
- Belotti, F., Tisi, R., and Martegani, E. (2006) The N-terminal region of the *Saccharomyces cerevisiae* RasGEF Cdc25 is required for nutrient-dependent cell-size regulation. *Microbiology (Reading, England)*, **152**, 1231–1242.
- Belov, M.E., Anderson, G.A., Angell, N.H. *et al.* (2001) Dynamic range expansion applied to mass spectrometry based on data-dependent selective ion ejection in capillary liquid chromatography Fourier transform ion cyclotron resonance for enhanced proteome characterization. *Analytical Chemistry*, **73**, 5052–5060.
- Beltrao, P., Trinidad, J.C., Fiedler, D. *et al.* (2009) Evolution of phosphoregulation, comparison of phosphorylation patterns across yeast species. *PLoS Biology*, **7**, e1000134.
- Ben-Aroya, S., Mieczkowski, P.A., Petes, T.D., and Kupiec, M. (2004) The compact chromatin structure of a Ty repeated sequence suppresses recombination hotspot activity in *Saccharomyces cerevisiae*. *Molecular Cell*, **15**, 221–31.
- Ben-Aroya, S., Coombes, C., Kwok, T. *et al.* (2008) Toward a comprehensive temperature-sensitive mutant repository of the essential genes of *Saccharomyces cerevisiae*. *Molecular Cell*, **30**, 248–258.
- Benders, G.A., Noskov, V.N., Denisova, E.A. *et al.* (2010) Cloning whole bacterial genomes in yeast. *Nucleic Acids Research*, **38**, 2558–2569.
- Bendich, A.J. (2007) The size and form of chromosomes are constant in the nucleus, but highly variable in bacteria, mitochondria and chloroplasts. *Bioessays*, **29**, 474–483.
- Benli, M., Doring, F., Robinson, D.G., Yang, X., and Gallwitz, D. (1996) Two GTPase isoforms, Ypt31p and Ypt32p, are essential for Golgi function in yeast. *The EMBO Journal*, **15**, 6460–6475.
- Bennett, M., Onnebo, S.M., Azevedo, C., and Saiardi, A. (2006) Inositol pyrophosphates:

- metabolism and signaling. *Cellular and Molecular Life Sciences*, **63**, 552–564.
- Bennetzen, J.L., Hall, B.D. (1982) Codon selection in yeast. *The Journal of Biological Chemistry*, **257**, 3026–3031.
- Ben-Shahar, T.R., Heeger, S., Lehane, C. et al. (2008) Eco1-dependent cohesin acetylation during establishment of sister chromatid cohesion. *Science*, **321**, 563–566.
- Beopoulos, A., Mrozova, Z., Thevenieau, F. et al. (2008) Control of lipid accumulation in the yeast *Yarrowia lipolytica*. *Applied Environmental Microbiology*, **74**, 7779–7789.
- Beopoulos, A., Chardot, T., and Nicaud, J.M. (2009) *Yarrowia lipolytica*. A model and a tool to understand the mechanisms implicated in lipid accumulation. *Biochimie*, **91**, 692–696.
- Beopoulos, A., Nicaud, J.M., and Gaillardin, C. (2011) An overview of lipid metabolism in yeasts and its impact on biotechnological processes. *Applied Microbiology and Biotechnology*, **90**, 1193–1206.
- Böer, E., Gellissen, G., and Kunze, G. (2005) *Arxula adenivorans*, in *Production of Recombinant Proteins – Novel Microbial and Eukaryotic Expression Systems*, vol. 1 (ed. G. Gellissen), Wiley-VCH Verlag GmbH, Weinheim, pp. 89–110.
- Bera, A.K., Ho, N.W., Khan, A., and Sedlak, M. (2011) A genetic overhaul of *Saccharomyces cerevisiae* 424A(LNH-ST) to improve xylose fermentation. *Journal of Industrial Microbiology & Biotechnology*, **38**, 617–626.
- Berg, P., Baltimore, D., Brenner, S., Roblin, R. O., and Singer, M.F. (1975) Summary statement of the Asilomar conference on recombinant DNA molecules. *Proceedings of the National Academy of Sciences of the United States of America*, **72**, 1981–1984.
- Berg, P. (1981) Dissections and reconstructions of genes and chromosomes. Nobel Lecture, 8 December 1980. *Bioscience Reports*, **1**, 269–287 (review).
- Berget, S.M., Moore, C., and Sharp, P.A. (1977) Spliced segments at the 5' terminus of adenovirus 2 late mRNA. *Proceedings of the National Academy of Sciences of the United States of America*, **74**, 3171–3175.
- Bergkamp, R.J., Kool, I.M., Geerse, R.H., and Planta, R.J. (1992) Multiple-copy integration of the alpha-galactosidase gene from *Cyamopsis tetragonoloba* into the ribosomal DNA of *Kluyveromyces lactis*. *Current Genetics*, **21**, 365–370.
- Bergmann, S., Ihmels, J., and Barkai, N. (2004) Similarities and differences in genome-wide expression data of six organisms. *PLoS Biology*, **2**, E9.
- Berlani, R.E., Pentella, C., Macino, G., and Tzagoloff, A. (1980) Assembly of the mitochondrial membrane system: isolation of mitochondrial transfer ribonucleic acid mutants and characterization of transfer ribonucleic acid genes of *Saccharomyces cerevisiae*. *Journal of Bacteriology*, **141**, 1086–1097.
- Berlin, V., Styles, C.A., and Fink, G.R. (1990) BIK1, a protein required for microtubule function during mating and mitosis in *Saccharomyces cerevisiae*, colocalizes with tubulin. *The Journal of Cell Biology*, **111**, 2573–2586.
- Berman, J. and Sudbery, P.E. (2002) *Candida albicans*, a molecular revolution built on lessons from budding yeast. *Nature Reviews Genetics*, **3**, 918–930.
- Berman, D.M., Kozasa, T., and Gilman, A.G. (1996) The GTPase-activating protein RGS4 stabilizes the transition state for nucleotide hydrolysis. *The Journal of Biological Chemistry*, **271**, 27209–27212.
- Bernard, F. and André, B. (2001) Ubiquitin and the SCF^{Grr1} ubiquitin ligase complex are involved in the signalling pathway activated by external amino acids in *Saccharomyces cerevisiae*. *FEBS Letters*, **496**, 81–85.
- Bernardi, G. (1976) Organization and evolution of the mitochondrial genome of yeast. *Journal of Molecular Evolution*, **9**, 25–35.
- Bernhardt, D. and Darnell, J.E.Jr (1969) tRNA synthesis in HeLa cells: a precursor to tRNA and the effects of methionine starvation on tRNA synthesis. *Journal of Molecular Biology*, **42**, 43–56.
- Bernstein, M., Hoffmann, W., Ammerer, G., and Schekman, R. (1985) Characterization of a gene product (Sec53p) required for protein assembly in the yeast endoplasmic reticulum. *The Journal of Cell Biology*, **101**, 2374–2382.
- Bernstein, M., Kepes, F., and Schekman, R. (1989) Sec59 encodes a membrane protein required for core glycosylation in *Saccharomyces cerevisiae*. *Molecular and Cellular Biology*, **9**, 1191–1199.
- Bernstein, B.E., Liu, C.L., Humphrey, E.L., Perlstein, E.O., and Schreiber, S.L. (2004) Global nucleosome occupancy in yeast. *Genome Biology*, **5**, R62.
- Berset, C., Trachsel, H., and Altmann, M. (1998) The TOR (target of rapamycin) signal transduction pathway regulates the stability of translation initiation factor eIF4G in the yeast *Saccharomyces cerevisiae*. *Proceedings of the National Academy of Sciences of the United States of America*, **95**, 4264–4269.
- Bertrand, E., Houser-Scott, F., Kendall, A., Singer, R.H., and Engelke, D.R. (1998) Nucleolar localization of early tRNA processing. *Genes and Development*, **12**, 2463–2468.
- Bertone, P., Gerstein, M., and Snyder, M. (2005) Applications of DNA tiling arrays to experimental genome annotation and regulatory pathway discovery. *Chromosome Research*, **13**, 259–274.
- Beyenbach, K.W. and Wiczorek, H. (2006) The V-type H⁺ ATPase: molecular structure and function, physiological roles and regulation. *The Journal of Experimental Biology*, **209**, 577–589 (review).
- Bharadwaj, P., Martins, R., and Macreadie, I. (2010) Yeast as a model for studying Alzheimer's disease. *FEMS Yeast Research*, **10**, 961–969 (review).
- Bi, X. and Broach, J.R. (2001) Chromosomal boundaries in *S. cerevisiae*. *Current Opinion in Genetics & Development*, **11**, 199–204 (review).
- Bi, E., Maddox, P., Lew, D.J. et al. (1998) Involvement of an actomyosin contractile ring in *Saccharomyces cerevisiae* cytokinesis. *The Journal of Cell Biology*, **142**, 1301–1312.
- Bianchi, M.M., Falcone, C., Chen, X.J., Weslowski, M., Frontali, L., and Fukuhara, H. (1987) Transformation of the yeast *Kluyveromyces lactis* by new vectors derived from the 1.6- μ m circular plasmid Pkd1. *Current Genetics*, **12**, 185–192.
- Bianchi, A., Negrini, S., and Shore, D. (2004) Delivery of yeast telomerase to a DNA break depends on the recruitment functions of Cdc13 and Est1. *Molecular Cell*, **16**, 139–146.
- Bicho, P.A., Runnals, P.L., Cunningham, J.D., and Lee, H. (1988) Induction of xylose reductase and xylitol dehydrogenase activities in *Pachysolen tannophilus* and *Pichia stipitis* on mixed sugars. *Applied and Environmental Microbiology*, **54**, 50–54.
- Bickford, L.C., Mossessova, E., and Goldberg, J. (2004) A structural view of the COPII vesicle coat. *Curr. Opin. Struct. Biol.*, **14**, 147–153.
- Bickford, L.C., Mossessova, E., and Goldberg, J. (2004) A structural view of the COPII vesicle coat. *Current Opinion in Structural Biology*, **14**, 147–153 (review).
- Biddick, R.K., Law, G.L., Chin, K.K.B., and Young, E.T. (2008) The transcriptional coactivators SAGA, SWI/SNF, and mediator make distinct contributions to activation of glucose-repressed genes. *The Journal of Biological Chemistry*, **283**, 33101–33109.
- Bidlingmaier, S., Weiss, E.L., Seidel, C., Drubin, D.G., and Snyder, M. (2001) The Cbk1p pathway is important for polarized cell growth and cell separation in *Saccharomyces cerevisiae*. *Molecular and Cellular Biology*, **21**, 2449–2462.
- Birse, C.E., Minvielle-Sebastia, L., Lee, B.A., Keller, W., and Proudfoot, N.J. (1998) Coupling termination of transcription to messenger RNA maturation in yeast. *Science*, **280**, 298–301.
- Bitterman, K.J., Medvedik, O., and Sinclair, D.A. (2003) Longevity regulation in *Saccharomyces cerevisiae*: linking metabolism, genome stability, and heterochromatin. *Microbiology and Molecular Biology Reviews*, **67**, 376–399 (review).
- Bittner, C.B., Zeisig, D.T., Zeisig, B.B., and Slany, R.K. (2004) Direct physical and functional interaction of the NuA4 complex components Yaf9p and Swc4p. *Eukaryotic Cell*, **3**, 976–983.
- Bjork, G.R., Ericson, J.U., Gustafsson, C.E., Hagervall, T.G., Jonsson, Y.H., and Wikstrom, P.M. (1987) Transfer RNA modification. *Annual Review of Biochemistry*, **56**, 263–287 (review).
- Bjork, G.R., Durand, J.M., Hagervall, T.G. et al. (1999) Transfer RNA modification: influence on translational frameshifting and metabolism. *FEBS Letters*, **452**, 47–51.
- Bjork, G.R., Jacobsson, K., Nilsson, K., Johansson, M.J., Bystrom, A.S., and Persson, O.P. (2001) A primordial tRNA modification required for the evolution of life? *The EMBO Journal*, **20**, 231–239.
- Bjornsti, M.A. and Houghton, P.J. (2004) The TOR pathway: a target for cancer therapy. *Nature Reviews Cancer*, **4**, 335–348.
- Black, M.W. and Pelham, H.R. (2000) A selective transport route from Golgi to late endosomes that requires the yeast GGA proteins. *The Journal of Cell Biology*, **151**, 587–600.
- Blackburn, E.H., Greider, C.W., and Szostak, J. W. (2006) Telomeres and telomerase: the path from maize, *Tetrahymena* and yeast to human cancer and aging. *Nature Medicine*, **12**, 1133–1138.
- Blagosklonny, M.V. and Hall, M.N. (2009) Growth and aging: a common molecular mechanism. *Aging*, **1**, 357–362.

- Blake, C.C.F. (1978) X-ray sequencing of proteins by refinement. *Nature*, **274**, 420–421.
- Blanchette, J.M., Abazeed, M.E., and Fuller, R.S. (2004) Cell-free reconstitution of transport from the *trans*-Golgi network to the late endosome/prevacuolar compartment. *The Journal of Biological Chemistry*, **279**, 48767–48773.
- Blanco, M., Nunez, L., Tarrío, N. *et al.* (2007) An approach to the hypoxic and oxidative stress responses in *Kluyveromyces lactis* by analysis of mRNA levels. *FEMS Yeast Research*, **7**, 702–714.
- Blander, G. and Guarente, L. (2004) The Sir2 family of protein deacetylases. *Annual Review of Biochemistry*, **73**, 417–435.
- Blastyak, A., Pintér, L., Unk, I., Prakash, L., Prakash, S., and Haracska, L. (2007) Yeast rad5 protein required for postreplication repair has a DNA helicase activity specific for replication fork regression. *Molecular Cell*, **28**, 167–175.
- Blatt, B. and Feldmann, H. (1973) Characterization of precursors to tRNA in yeast. *FEBS Letters*, **37**, 129–134.
- Blattner, F.R., Williams, B.G., Blechl, A.E. *et al.* (1977) Charon phages: safer derivatives of bacteriophage lambda for DNA cloning. *Science*, **196**, 161–169.
- Bleichert, F. and Baserga, S.J. (2007) The long unwinding road of RNA helicases. *Molecular Cell*, **27**, 339–352.
- Bleykasten-Grosshans, C. and Neuvéglise, C. (2011) Transposable elements in yeasts. *Comptes Rendus Biologies*, **334**, 679–686.
- Blobel, G. and Dobberstein, B. (1975) Transfer of proteins across membranes. *The Journal of Cell Biology*, **67**, 835–851.
- Blobel, G. and Sabatini, D.D. (1971) Dissociation of mammalian polyribosomes into subunits by puromycin. *Proceedings of the National Academy of Sciences of the United States of America*, **68**, 390–394.
- Blobel, G. (1980) Intracellular protein topogenesis. *Proceedings of the National Academy of Sciences of the United States of America*, **77**, 1496–1500.
- Blomberg, A., Blomberg, L., Norbeck, J. *et al.* (1995) Interlaboratory reproducibility of yeast protein patterns analyzed by immobilized pH gradient two-dimensional gel electrophoresis. *Electrophoresis*, **16**, 1935–1945.
- Bochman, M.L. and Schwacha, A. (2009) The Mcm complex: unwinding the mechanism of a replicative helicase. *Microbiology and Molecular Biology Reviews*, **73**, 652–683.
- Bochman, M.L., Sabouri, N., and Zakian, V.A. (2010) Unwinding the functions of the Pif1 family helicases. *DNA Repair*, **9**, 237–249.
- Bodner, R.A., Outeiro, T.F., Altmann, S. *et al.* (2006) Pharmacological promotion of inclusion formation: a therapeutic approach for Huntington's and Parkinson's diseases. *Proceedings of the National Academy of Sciences of the United States of America*, **103**, 4246–4251.
- Boeckstaens, M., André, B., and Marini, A.M. (2008) Distinct transport mechanisms in yeast ammonium transport/sensor proteins of the Mep/Amt/Rh family and impact on filamentation. *The Journal of Biological Chemistry*, **283**, 21362–21370.
- Boeke, J.D., Garfinkel, D.J., Styles, C.A., and Fink, G.R. (1985) Ty elements transpose through an RNA intermediate. *Cell*, **40**, 491–500.
- Boer, V.M., Tai, S.L., Vuralhan, Z. *et al.* (2007) Transcriptional responses of *Saccharomyces cerevisiae* to preferred and nonpreferred nitrogen sources in glucose-limited chemostat cultures. *FEMS Yeast Research*, **7**, 604–620.
- Boer, E., Schroter, A., Bode, R., Piontek, M., and Kunze, G. (2009) Characterization and expression analysis of a gene cluster for nitrate assimilation from the yeast *Arxula adenivorans*. *Yeast (Chichester, England)*, **26**, 83–93.
- Boguta, M., Czarska, K., and Zowadek, T. (1997) Mutation in a new gene MAF1 affects tRNA suppressor efficiency in *Saccharomyces cerevisiae*. *Genetics*, **185**, 291–296.
- Bohnert, M., Pfanner, N., and van der Laan, M. (2007) A dynamic machinery for import of mitochondrial precursor proteins. *FEBS Letters*, **581**, 2802–2810 (review).
- Bohni, P.C., Daum, G., and Schatz, G. (1983) Import of proteins into mitochondria. Partial purification of a matrix-located protease involved in cleavage of mitochondrial precursor polypeptides. *The Journal of Biological Chemistry*, **258**, 4937–4943.
- Bohni, P.C., Deshaies, R.J., and Schekman, R. W. (1988) *SEC11* is required for signal peptide processing and yeast cell growth. *The Journal of Cell Biology*, **106**, 1035–1042.
- Bohnsack, M.T., Martin, R., Granneman, S., Ruprecht, M., Schleiff, E., and Tollervey, D. (2009) Prp43 bound at different sites on the pre-rRNA performs distinct functions in ribosome synthesis. *Molecular Cell*, **36**, 583–592.
- Boisrame, A., Kabani, M., Beckerich, J.M., Hartmann, E., and Gaillardin, C. (1998) Interaction of Kar2p and Sls1p is required for efficient co-translational translocation of secreted proteins in the yeast *Yarrowia lipolytica*. *The Journal of Biological Chemistry*, **273**, 30903–30908.
- Boisrame, A., Cornu, A., Da Costa, G., and Richard, M.L. (2011) Unexpected role for a serine/threonine-rich domain in the *Candida albicans* Iff protein family. *Eukaryotic Cell*, **10**, 1317–1330.
- Boisvert, F.M., van Koningsbruggen, S., Navascués, J., and Lamond, A.I. (2007) The multifunctional nucleolus. *Nature Reviews Molecular Cell Biology*, **8**, 574–585.
- Boisvert, F.M., *et al.* (2007) The multifunctional nucleolus. *Nat Rev Mol Cell Biol.*, **8**, 574–585.
- Bojunga, N. and Entian, K.D. (1999) Cat8p, the activator of gluconeogenic genes in *Saccharomyces cerevisiae*, regulates carbon source-dependent expression of NADP-dependent cytosolic isocitrate dehydrogenase (Idp2p) and lactate permease (Jen1p). *Molecular & General Genetics*, **262**, 869–875.
- Bolivar, F., Rodriguez, R.L., Betlach, M.C., and Boyer, H.W. (1977a) Construction and characterization of new cloning vehicles. I. Ampicillin-resistant derivatives of the plasmid pMB9. *Genetics*, **2**, 75–93.
- Bolivar, F., Rodriguez, R.L., Greene, P.J., Betlach, M.C., Heyneker, H.L., and Boyer, H. W. (1977b) Construction and characterization of new cloning vehicles. II. A multipurpose cloning system. *Genetics*, **2**, 95–113.
- Bollen, G.H., Mager, W.H., Jennessens, L.W., and Planta, R.J. (1980) Small-size mRNAs code for ribosomal proteins in yeast. *European Journal of Biochemistry*, **105**, 75–80.
- Bolliger, L., Deloche, O., Glick, B.S. *et al.* (1994) A mitochondrial homolog of bacterial GrpE interacts with mitochondrial hsp70 and is essential for viability. *The EMBO Journal*, **13**, 1998–2006.
- Bolotin, M., Coen, D., Deutsch, J. *et al.* (1971) La recombinaison des mitochondries chez *Saccharomyces cerevisiae*. *Bulletin de l'Institut Pasteur, Paris*, **69**, 215–239.
- Bolton, E.C. and Boeke, J.D. (2003) Transcriptional interactions between yeast tRNA genes, flanking genes and Ty elements: a genomic point of view. *Genome Research*, **13**, 254.
- Bon, E., Neuvéglise, C., Casarégola, S. *et al.* (2000a) Genomic exploration of the hemiascomycetous yeasts. 5. *Saccharomyces bayanus* var. *uvarum*. *FEBS Letters*, **487**, 37–41.
- Bon, E., Neuvéglise, C., Lépingle, A. *et al.* (2000b) Genomic exploration of the hemiascomycetous yeasts. 6. *Saccharomyces exiguus*. *FEBS Letters*, **487**, 42–46.
- Bon, E., Casarégola, S., Blandin, G. *et al.* (2003) Molecular evolution of eukaryotic genomes, hemiascomycetous yeast spliceosomal introns. *Nucleic Acids Research*, **31**, 1121–1135.
- Bonawitz, N.D., Rodeheffer, M.S., and Shadel, G.S. (2006) Defective mitochondrial gene expression results in reactive oxygen species-mediated inhibition of respiration and reduction of yeast life span. *Molecular and Cellular Biology*, **26**, 4818–4829.
- Bond, U. (2009) The genomes of lager yeasts. *Advances in Applied Microbiology*, **69**, 159–182.
- Bonen, L. and Doolittle, W.F. (1978) Ribosomal RNA homologies and the evolution of the filamentous blue-green bacteria. *Journal of Molecular Evolution*, **10**, 283–291.
- Bonetti, B., Clerici, M., Anbalagan, S., Martina, M., Lucchini, G., and Longhese, M.P. (2010) Shelterin-like proteins and yku inhibit nucleolytic processing of *Saccharomyces cerevisiae* telomeres. *PLoS Genetics*, **6**, e1000966.
- Bonifacino, J.S. and Glick, B.S. (2004) The mechanisms of vesicle budding and fusion. *Cell*, **116**, 153–166 (review).
- Bonitz, S.G., Berhani, R., Coruzzi, G. *et al.* (1980) Codon recognition rules in yeast mitochondria. *Proceedings of the National Academy of Sciences of the United States of America*, **77**, 3167–3170.
- Bonnefoy, N. and Fox, T.D. (2001) Genetic transformation of *S. cerevisiae* mitochondria. *Methods in Cell Biology*, **65**, 381–396.
- Bonnefoy, N., Chalvet, F., Hamel, P., Slonimski, P.P., and Dujardin, G. (1994) OXA1, a *Saccharomyces cerevisiae* nuclear gene whose sequence is conserved from prokaryotes to eukaryotes controls cytochrome oxidase biogenesis. *Journal of Molecular Biology*, **239**, 201–212.
- Bonner, J.J., Carlson, T., Fackenthal, D.L., Paddock, D., Storey, K., and Lea, K. (2000) Complex regulation of the yeast heat shock transcription factor. *Molecular Biology of the Cell*, **11**, 1739–1751.
- Bonnerot, C., Pintard, L., and Lutfalla, G. (2003) Functional redundancy of Spb1p and a snR52-dependent mechanism for the 2'-O-ribose

- methylation of a conserved rRNA position in yeast. *Molecular Cell*, **12**, 1309–1315.
- Bonnet, J., Romier, C., Tora, L., and Devys, D. (2008) Zinc-finger UBPs: regulators of deubiquitylation. *Trends in Biochemical Sciences*, **33**, 369–375.
- Bordallo, J., Plemper, R.K., Finger, A., and Wolf, D.H. (1998) Der3p/Hdr1p is required for endoplasmic reticulum associated protein degradation of misfolded luminal and integral membrane proteins. *Molecular Biology of the Cell*, **9**, 209–222.
- Bordone, L. and Guarente, L. (2005) Calorie restriction, SIRT1 and metabolism: understanding longevity. *Nature Reviews Molecular Cell Biology*, **6**, 298–305.
- Borneman, A.R., Gianoulis, T.A., Zhang, Z.D. et al. (2007a) Divergence of transcription factor binding sites across related yeast species. *Science*, **317**, 815–819.
- Borneman, A.R., Zhang, Z.D., Rozowsky, J., Seringhaus, M.R., Gerstein, M., and Snyder, M. (2007b) Transcription factor binding site identification in yeast, a comparison of high-density oligonucleotide and PCR-based microarray platforms. *Functional & Integrative Genomics*, **7**, 335–345.
- Borneman, A.R., Gianoulis, T.A., Zhang, Z.D. et al. (2007c) Divergence of transcription factor binding sites across related yeast species. *Science*, **317**, 815–819.
- Borneman, A.R., Forgan, A.H., Pretorius, I.S., and Chambers, P.J. (2008) Comparative genome analysis of a *Saccharomyces cerevisiae* wine strain. *FEMS Yeast Research*, **8**, 1185–1195.
- Bortvin, A. and Winston, F. (1996) Evidence that Spt6p controls chromatin structure by a direct interaction with histones. *Science*, **272**, 1473–1476.
- Bos, J.L., Heyting, C., and Borst, P. (1978) An insert in the single gene for the large ribosomal RNA in yeast mitochondrial DNA. *Nature*, **275**, 336–338.
- Bosotti, R., Isacchi, A., and Sonhammer, E.L. (2000) FAT: a novel domain in PIK-related kinases. *Trends in Biochemical Sciences*, **25**, 225–227.
- Boss, J.M., Gillam, S., Zitomer, R.S., and Smith, M. (1981) Sequence of the yeast iso-1-cytochrome c mRNA. *The Journal of Biological Chemistry*, **256**, 12958–12961.
- Bossier, P., Fitch, I.T., Boucherie, H., and Tuite, M.F. (1989) Structure and expression of a yeast gene encoding the small heat-shock protein Hsp26. *Genetics*, **78**, 323–330.
- Bossier, P., Fernandes, L., Rocha, D., and Rodrigues-Pousada, C. (1993) Overexpression of YAP2, coding for a new yAP protein, and YAP1 in *Saccharomyces cerevisiae* alleviates growth inhibition caused by 1, 10-phenanthroline. *The Journal of Biological Chemistry*, **268**, 23640–23645.
- Bossis, G. and Melchior, F. (2006) SUMO: regulating the regulator. *Cell Div*, **1**, 13.
- Botstein, D. and Davis, R.W. (1982) Principles and practice of recombinant DNA research with yeast, in *The Molecular Biology of the Yeast Saccharomyces cerevisiae: Metabolism and Gene Expression* (eds J.N. Strathern, E.W. Jones, and J.R. Broach), Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, pp. 607–636.
- Botstein, D. and Fink, G.R. (2011) Yeast: an experimental organism for 21st century biology. *Genetics*, **189**, 695–704.
- Botstein, D., Amberg, D., Mulholland, J. et al. (1997) The yeast cytoskeleton, in *The Molecular and Cellular Biology of the Yeast Saccharomyces: Cell Cycle and Cell Biology* (eds J.R. Pringle, J.R. Broach, and E.W. Jones), Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, pp. 1–90.
- Botstein, D. (1986) Why study the cytoskeleton in yeast? *Harvey Lectures*, **82**, 157–167 (review).
- Botstein, D. (2004) Ira Herskowitz: 1946–2003. *Genetics*, **166**, 653–660.
- Bouck, D.C., Joglekar, A.P., and Bloom, K.S. (2008) Design features of a mitotic spindle: balancing tension and compression at a single microtubule kinetochore interface in budding yeast. *Annual Review of Genetics*, **42**, 335–359.
- Boule, J.P. and Zakian, V.A. (2006) Roles of Pif1-like helicases in the maintenance of genomic stability. *Nucleic Acids Research*, **34**, 4147–4153.
- Bourbon, H.M., Aguilera, A., Ansari, A.Z. et al. (2004) A unified nomenclature for protein subunits of mediator complexes linking transcriptional regulators to RNA polymerase II. *Molecular Cell*, **14**, 553–557.
- Bovers, M., Hagen, F., Kuramae, E.E. et al. (2006) Unique hybrids between the fungal pathogens *Cryptococcus neoformans* and *Cryptococcus gattii*. *FEMS Yeast Research*, **6**, 599–607.
- Bowen, B.A., Fulton, A.M., Tuite, M.F., Kingsman, S.M., and Kingsman, A.J. (1984) Expression of Ty-*lacZ* fusions in *Saccharomyces cerevisiae*. *Nucleic Acids Research*, **12**, 1627–1640.
- Bowers, K. and Stevens, T.H. (2005) Protein transport from the late Golgi to the vacuole in the yeast *Saccharomyces cerevisiae*. *Biochimica et Biophysica Acta*, **1744**, 438–454 (review).
- Bowers, K., Lottridge, J., Helliwell, S.B., Goldthwaite, L.M., Luzio, J.P., and Stevens, T.H. (2004) Protein-protein interactions of ESCRT complexes in the yeast *Saccharomyces cerevisiae*. *Traffic (Copenhagen, Denmark)*, **5**, 194–210.
- Bradley, M.E., Edskes, H.K., Hong, J.Y., Wickner, R.B., and Liebman, S.W. (2002) Interactions among prions and prion “strains” in yeast. *Proceedings of the National Academy of Sciences of the United States of America*, **99**, 16392–16399.
- Brake, A.J. (1989) Secretion of heterologous proteins directed by the yeast α -factor leader, in *Yeast Genetic Engineering* (eds P.J. Barr, A.J. Brake, and P. Valenzuela), Butterworths, Boston, MA, pp. 269–280.
- Bram, R.J. and Kornberg, R.D. (1985) Specific protein binding to far upstream activating sequences in polymerase II promoters. *Proceedings of the National Academy of Sciences of the United States of America*, **82**, 43–47.
- Bram, R.J. and Kornberg, R.D. (1987) Isolation of a *Saccharomyces cerevisiae* centromere DNA-binding protein, its human homolog, and its possible role as a transcription factor. *Molecular and Cellular Biology*, **7**, 403–409.
- Bram, R.J., Lue, N.F., and Kornberg, R.D. (1986) A GAL family of upstream activating sequences in yeast: roles in both induction and repression of transcription. *The EMBO Journal*, **5**, 603–608.
- Brandl, C.J. and Struhl, K. (1989) Yeast GCN4 transcriptional activator protein interacts with RNA polymerase II *in vitro*. *Proceedings of the National Academy of Sciences of the United States of America*, **86**, 2652–2656.
- Brandl, C.J. and Struhl, K. (1990) A nucleosome-positioning sequence is required for GCN4 to activate transcription in the absence of a TATA element. *Molecular and Cellular Biology*, **10**, 4256–4265.
- Brandt, U., Garofano, A., Grgic, L., Zickermann, V., Drose, S., and Kerscher, S. (2004) *Yarrowia lipolytica*, a model organism to study mitochondrial complex I by yeast genetics. *Biochimica et Biophysica Acta – Bioenergetics*, **1657**, 21–27.
- Branduardi, P., Fossati, T., Sauer, M., Pagani, R., Mattanovich, D., and Porro, D. (2007) Biosynthesis of vitamin C by yeast leads to increased stress resistance. *PLoS ONE*, **2**, e1092.
- Branzei, D. and Foiani, M. (2009) The checkpoint response to replication stress. *DNA Repair*, **8**, 1038–1046.
- Braun, B.R., Riggs, D.L., Kassavetis, G.A., and Geiduschek, E.P. (1989) Multiple states of protein-DNA interaction in the assembly of transcription complexes on *Saccharomyces cerevisiae* 5S ribosomal RNA genes. *Proceedings of the National Academy of Sciences of the United States of America*, **86**, 2530–2534.
- Braun, B.R., Bartholomew, B., Kassavetis, G.A., and Geiduschek, E.P. (1992a) Topography of transcription factor complexes on the *Saccharomyces cerevisiae* 5S RNA gene. *Journal of Molecular Biology*, **228**, 1063–1077.
- Braun, B.R., Kassavetis, G.A., and Geiduschek, E.P. (1992b) Bending of the *Saccharomyces cerevisiae* 5S rRNA gene in transcription factor complexes. *The Journal of Biological Chemistry*, **267**, 22562–22569.
- Braun, B.C., Glickman, M., Kraft, R. et al. (1999) The base of the proteasome regulatory particle exhibits chaperone-like activity. *Nature Cell Biology*, **1**, 221–226.
- Braun, S., Matuschewski, K., Rape, M., Thoms, S., and Jentsch, S. (2002) Role of the ubiquitin-selective CDC48(UFD1/NPL4) chaperone (segregase) in ERAD of OLE1 and other substrates. *The EMBO Journal*, **21**, 615–621.
- Brückner, A., Polge, C., Lentze, N., Auerbach, D., and Schlattner, U. (2009) Yeast two-hybrid, a powerful tool for systems biology. *International Journal of Molecular Science*, **10**, 2763–2788.
- Breathnach, R. and Chambon, P. (1981) Organization and expression of eucaryotic split genes coding for proteins. *Annual Review of Biochemistry*, **50**, 349–384.
- Breathnach, R., Mandel, J.-L., and Chambon, P. (1977) Ovalbumin gene is split in chicken DNA. *Nature*, **270**, 314–319.
- Breitkreutz, A., Choi, H., Sharom, J.R. et al. (2010) A global protein kinase and phosphatase interaction network in yeast. *Science*, **328**, 1043–1046.
- Brennwald, P. and Rossi, G. (2007) Spatial regulation of exocytosis and cell polarity: yeast as a model for animal cells. *FEBS Letters*, **581**, 2119–2124.

- Brent, R. and Ptashne, M. (1985) A eukaryotic transcriptional activator bearing the DNA specificity of a prokaryotic repressor. *Cell*, **43**, 729–736.
- Breslow, D.K., Cameron, D.M., Collins, S.R. et al. (2008) A comprehensive strategy enabling high-resolution functional analysis of the yeast genome. *Nature Methods*, **5**, 711–718.
- Breuer, U. and Harms, H. (2006) *Debaryomyces hansenii* – an extremophilic yeast with biotechnological potential. *Yeast (Chichester, England)*, **23**, 415–437.
- Brigati, C., Kurtz, S., Balderes, D., Vidali, G., and Shore, D. (1993) An essential yeast gene encoding a TTAGGG repeat-binding protein. *Molecular and Cellular Biology*, **13**, 1306–1314.
- Briggs, S.D., Bryk, M., Strahl, B.D. et al. (2001) Histone H3 lysine 4 methylation is mediated by Set1 and required for cell growth and rDNA silencing in *Saccharomyces cerevisiae*. *Genes and Development*, **15**, 3286–3295.
- Brill, S.J. and Stillman, B. (1991) Replication factor-A from *Saccharomyces cerevisiae* is encoded by three essential genes coordinately expressed at S phase. *Genes and Development*, **5**, 1589–1600.
- Brisse, S., Pannier, C., Angoulvant, A. et al. (2009) Uneven distribution of mating types among genotypes of *Candida glabrata* isolates from clinical samples. *Eukaryotic Cell*, **8**, 287–295.
- Broach, J.R., Strathern, J.N., and Hicks, J.B. (1979) Transformation in yeast: development of a hybrid cloning vector and isolation of the *CAN1* gene. *Genetics*, **8**, 121–133.
- Broach, J., Li, Y.-Y., Feldman, J. et al. (1983) Localization and sequence analysis of yeast origins of DNA replication. *Cold Spring Harbor Symposia on Quantitative Biology*, **47**, 1165–1173.
- Broach, J.N., Pringle, J.R., and Jones, E.W. (eds) (1991) *The Molecular and Cellular Biology of the Yeast Saccharomyces*. Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY.
- Brockert, P.J., Lachke, S.A., Srikantha, T., Pujol, C., Galask, R., and Soll, D.R. (2003) Phenotypic switching and mating type switching of *Candida glabrata* at sites of colonization. *Infection and Immunity*, **71**, 7109–7118.
- Broder, Y.C., Katz, S., and Aronheim, A. (1998) The Ras recruitment system, a novel approach to the study of protein–protein interactions. *Current Biology*, **8**, 1121–1124.
- Brodeur, G.M., Sandmeyer, S.B., and Olson, M.V. (1983) Consistent association between sigma elements and tRNA genes in yeast. *Proceedings of the National Academy of Sciences of the United States of America*, **80**, 3292–3296.
- Brodsky, J.L., Goekeler, J., and Schekman, R. (1995) BiP and Sec63p are required for both co- and posttranslational protein translocation into the yeast endoplasmic reticulum. *Proceedings of the National Academy of Sciences of the United States of America*, **92**, 9643–9646.
- Brody, E. and Abelson, J. (1985) The “spliceosome”: yeast pre-messenger RNA associates with a 40S complex in a splicing-dependent reaction. *Science*, **228**, 963–967.
- Brohée, S., Barriot, R., Moreau, Y., and André, B. (2010) YTPdb: a wiki database of yeast membrane transporters. *Biochimica et Biophysica Acta*, **1798**, 1908–1912.
- Broomfield, S., Chow, B.L., and Xiao, W. (1998) MMS2, encoding a ubiquitin-conjugating-enzyme-like protein, is a member of the yeast error-free postreplication repair pathway. *Proceedings of the National Academy of Sciences of the United States of America*, **95**, 5678–5683.
- Brosius, J., Palmer, M.L., Kennedy, P.J., and Noller, H.F. (1978) Complete nucleotide sequence of a 16S ribosomal RNA gene from *Escherichia coli*. *Proceedings of the National Academy of Sciences of the United States of America*, **75**, 4801–4805.
- Brosius, J., Dull, T.J., and Noller, H.F. (1980) Complete nucleotide sequence of a 23S ribosomal RNA gene from *Escherichia coli*. *Proceedings of the National Academy of Sciences of the United States of America*, **77**, 201–204.
- Brow, D.A. and Guthrie, C. (1990) Transcription of a yeast U6 snRNA gene requires a polymerase III promoter element in a novel position. *Genes and Development*, **4**, 1345–1356.
- Brown, A.J., Planta, R.J., Restuhadi, F. et al. (2001) Transcript analysis of 1003 novel yeast genes using high-throughput northern hybridizations. *The EMBO Journal*, **20**, 3177–3186.
- Brown, V., Sabina, J., and Johnston, M. (2009) Specialized sugar sensing in diverse fungi. *Current Biology*, **19**, 436–441.
- Brown, A.J.P. (1994) Measurement of mRNA stability, in *Molecular Genetics of Yeast: A Practical Approach* (ed. J.R. Johnston), IRL Press, Oxford, pp. 147–160.
- Brown, S.S. (1997) Myosins in yeast. *Current Opinion in Cell Biology*, **9**, 44–48.
- Brownlee, G.G., Sanger, F., and Barrell, B.G. (1967) Nucleotide sequence of 5S-ribosomal RNA from *Escherichia coli*. *Nature*, **215**, 735–736.
- Brugere, J.F., Cornillot, E., Metenier, G., and Vivares, C.P. (2000) In-gel DNA radiolabelling and two-dimensional pulsed field gel electrophoresis procedures suitable for fingerprinting and mapping small eukaryotic genomes. *Nucleic Acids Research*, **28**, E4–E8.
- Brun, I., Sentenac, A., and Werner, M. (1997) Dual role of the C34 subunit of RNA polymerase III in transcription initiation. *The EMBO Journal*, **16**, 5730–5741.
- Bryant, G.O. and Ptashne, M. (2003) Independent recruitment *in vivo* by Gal4 of two complexes required for transcription. *Molecular Cell*, **11**, 1301–1309.
- Bryant, N.J. and Stevens, T.H. (1998) Vacuole biogenesis in *Saccharomyces cerevisiae*: protein transport pathways to the yeast vacuole. *Microbiology and Molecular Biology Reviews*, **62**, 230–47.
- Bryant, G.O., Prabhu, V., Floer, M. et al. (2008) Activator control of nucleosome occupancy in activation and repression of transcription. *PLoS Biology*, **6**, 2928–2939.
- Brymora, A., Valova, V.A., and Robinson, P.J. (2004) Protein–protein interactions identified by pull-down experiments and mass spectrometry. *Current Protocols in Cell Biology*, Chapter 17, unit 17.5.
- Bösl, B., Griminger, V., and Walter, S. (2006) The molecular chaperone Hsp104 – a molecular machine for protein disaggregation. *Journal of Structural Biology*, **156**, 139–148. Review.
- Büttner, K., Wenig, K., and Hopfner, K.P. (2005) Structural framework for the mechanism of archaeal exosomes in RNA processing. *Molecular Cell*, **20**, 461–471.
- Büttner, K., Wenig, K., and Hopfner, K.P. (2006) The exosome: a macromolecular cage for controlled RNA degradation. *Molecular Microbiology*, **61**, 1372–1379.
- Buchberger, A., Howard, M.J., Proctor, M., and Bycroft, M. (2001) The UB3 domain: a widespread ubiquitin-like module. *Journal of Molecular Biology*, **307**, 17–24.
- Buchberger, A. (2002) From UBA to UB3: new words in the ubiquitin vocabulary. *Trends in Cell Biology*, **12**, 216–221.
- Buchman, A.R., Lue, N.F., and Kornberg, R.D. (1988) Connections between transcriptional activators, silencers, and telomeres as revealed by functional analysis of a yeast DNA-binding protein. *Molecular and Cellular Biology*, **8**, 5086–5099.
- Buck, M.J. and Lieb, J.D. (2006) A chromatin-mediated mechanism for specification of conditional transcription factor targets. *Nature Genetics*, **38**, 1446–1451.
- Buck, M.J., Nobel, A.B., and Lieb, J.D. (2005) ChIPOTle: a user-friendly tool for the analysis of ChIP-chip data. *Genome Biology*, **6**, R97.
- Bucking-Throm, E., Duntze, W., Hartwell, L.H., and Manney, T.R. (1973) Reversible arrest of haploid yeast cells at the initiation of DNA synthesis by a diffusible sex factor. *Experimental Cell Research*, **76**, 99–110.
- Buhler, J.M., Sentenac, A., and Fromageot, P. (1974) Isolation, structure, and general properties of yeast ribonucleic acid polymerase A (or I). *The Journal of Biological Chemistry*, **249**, 5963–5970.
- Buhler, J.M., Iborra, F., Sentenac, A., and Fromageot, P. (1976a) Structural studies on yeast RNA polymerases. Existence of common subunits in RNA polymerases A(I) and B(II). *The Journal of Biological Chemistry*, **251**, 1712–1717.
- Buhler, J.M., Iborra, F., Sentenac, A., and Fromageot, P. (1976b) The presence of phosphorylated subunits in yeast RNA polymerases A and B. *FEBS Letters*, **72**, 37–41.
- Bukau, B. and Horwich, A.L. (1998) The Hsp70 and Hsp60 chaperone machines. *Cell*, **92**, 351–366.
- Bulman, A.L., Hubl, S.T., and Nelson, H.C. (2001) The DNA-binding domain of yeast heat shock transcription factor independently regulates both the N- and C-terminal activation domains. *The Journal of Biological Chemistry*, **276**, 40254–40262.
- Bultynck, G., Heath, V.L., Majeed, A.P., Galan, J. M., Haguenaer-Tsapis, R., and Cyert, M.S. (2006) Slm1 and Slm2 are novel substrates of the calcineurin phosphatase required for heat stress-induced endocytosis of the yeast uracil permease. *Molecular and Cellular Biology*, **26**, 4729–4745.
- Bulyk, M.L. (2006) DNA microarray technologies for measuring protein–DNA interactions. *Current Opinion in Biotechnology*, **17**, 422–430.
- Buratowski, S., Hahn, S., Sharp, P.A., and Guarente, L. (1988) Function of a yeast TATA element-binding protein in a mammalian transcription system. *Nature*, **334**, 37–42.

- Buratowski, S., Hahn, S., Guarente, L., and Sharp, P.A. (1989) Five intermediate complexes in transcription initiation by RNA polymerase II. *Cell*, **56**, 549–561.
- Burke, D.T., Carle, G.F., and Olson, M.V. (1987) Cloning of large segments of exogenous DNA into yeast by means of artificial chromosome vectors. *Science*, **236**, 806–812.
- Burke, P.V., Raitt, D.C., Allen, L.A., Kellogg, E. A., and Poyton, R.O. (1997) Effects of oxygen concentration on the expression of cytochrome *c* and cytochrome *c* oxidase genes in yeast. *The Journal of Biological Chemistry*, **272**, 14705–14712.
- Burkholder, A.C. and Hartwell, L.H. (1985) The yeast alpha-factor receptor: structural properties deduced from the sequence of the *STE2* gene. *Nucleic Acids Research*, **13**, 8463–8475.
- Burnie, J.P., Carter, T.L., Hodgetts, S.J., and Matthews, R.C. (2006) Fungal heat-shock proteins in human disease. *FEMS Microbiology Reviews*, **30**, 53–88.
- Burnol, A.F., Margottin, F., Huet, J. *et al.* (1993a) TFIIIC relieves repression of U6 snRNA transcription by chromatin. *Nature*, **362**, 475–477.
- Burnol, A.F., Margottin, F., Schultz, P., Marsolier, M.C., Oudet, P., and Sentenac, A. (1993b) Basal promoter and enhancer element of yeast U6 snRNA gene. *Journal of Molecular Biology*, **233**, 644–658.
- Burri, L. and Lithgow, T. (2004) A complete set of SNAREs in yeast. *Traffic (Copenhagen, Denmark)*, **5**, 45–52.
- Burri, L., Varlamov, O., Doege, C.A. *et al.* (2003) A SNARE required for retrograde transport to the endoplasmic reticulum. *Proceedings of the National Academy of Sciences of the United States of America*, **100**, 9873–9877.
- Burri, L., Vascotto, K., Fredersdorf, S., Tiedt, R., Hall, M.N., and Lithgow, T. (2004) Zim17, a novel zinc finger protein essential for protein import into mitochondria. *The Journal of Biological Chemistry*, **279**, 50243–50249.
- Buschhorn, B.A., Kostova, Z., Medicherla, B., and Wolf, D.H. (2004) A genome-wide screen identifies Yos9p as essential for ER-associated degradation of glycoproteins. *FEBS Letters*, **577**, 422–426.
- Bushnell, D.A. and Kornberg, R.D. (2003) Complete, 12-subunit RNA polymerase II at 4.1-Å resolution: implications for the initiation of transcription. *Proceedings of the National Academy of Sciences of the United States of America*, **100**, 6969–6973.
- Bussereau, F., Casaregola, S., Lafay, J.F., and Bolotin-Fukuhara, M. (2006) The *Kluyveromyces lactis* repertoire of transcriptional regulators. *FEMS Yeast Research*, **6**, 325–335 (review).
- Bussey, H., Kaback, D.B., Zhong, W., Vo, D.T., Clark, M.W., Fortin, N., Hall, J., Ouellette, B.F., Keng, T., Barton, A.B., *et al.* (1995) The nucleotide sequence of chromosome I from *Saccharomyces cerevisiae*. *Proceedings of the National Academy of Sciences of the United States of America*, **92**, 3809–3813.
- Butinar, L., Strmole, T., and Gunde-Cimerman, N. (2011) Relative incidence of ascomycetous yeasts in arctic coastal environments. *Microbial Ecology*, **61**, 832–843.
- Butler, G., Kenny, C., Fagan, A., Kurischko, C., Gaillardin, C., and Wolfe, K.H. (2004) Evolution of the *MAT* locus and its HO endonuclease in yeast species. *Proceedings of the National Academy of Sciences of the United States of America*, **101**, 1632–1637.
- Butler, G., Rasmussen, M.D., Lin, M.F. *et al.* (2009) Evolution of pathogenicity and sexual reproduction in eight *Candida* genomes. *Nature*, **459**, 657–662.
- Butler, G. (2010) Fungal sex and pathogenesis. *Clinical Microbiology Reviews*, **23**, 140–159.
- Buts, J.P. and Bernasconi, P. (2005) *Saccharomyces boulardii*: basic science and clinical applications in gastroenterology. *Gastroenterology Clinics North America*, **34**, 515–532 (review).
- Buvelot, S., Tatsutani, S.Y., Vermaak, D., and Biggins, S. (2003) The budding yeast Ipl1/Aurora protein kinase regulates mitotic spindle disassembly. *The Journal of Cell Biology*, **160**, 329–339.
- Byers, B. and Goetsch, L. (1976) A highly ordered ring of membrane-associated filaments in budding yeast. *The Journal of Cell Biology*, **69**, 717–721.
- Byrne, K.P. and Wolfe, K.H. (2004) Consistent patterns of rate asymmetry and gene loss indicate widespread neofunctionalization of yeast genes after whole-genome duplication. *Genetics*, **175**, 1341–1350.
- Byrne, K.P. and Wolfe, K.H. (2005) The yeast gene order browser: combining curated homology and syntenic context reveals gene fate in polyploid species. *Genome Research*, **15**, 1456–1461, <http://wolfe.gen.tcd.ie/ygob>.
- Byrne, K.P. and Wolfe, K.H. (2007) Consistent patterns of rate asymmetry and gene loss indicate widespread neofunctionalization of yeast genes after whole-genome duplication. *Genetics*, **175**, 1341–1350.
- Byrnes, J.K., Morris, G.P., and Li, W.H. (2006) Reorganization of adjacent gene relationships in yeast genomes by whole-genome duplication and gene deletion. *Molecular Biology and Evolution*, **23**, 1136–1143.
- Byström, A.S. and Fink, G.R. (1989) A functional analysis of the repeated methionine initiator tRNA genes (IMT) in yeast. *Molecular General Genetics*, **216**, 276–286.
- C. elegans* Sequencing Consortium (1998) Genome sequence of the nematode *C. elegans*, a platform for investigating biology. *Science*, **282**, 2012–2018.
- Cabib, E., Drgon, T., Drgonova, J., Ford, R.A., and Kollar, R. (1997) The yeast cell wall, a dynamic structure engaged in growth and morphogenesis. *Biochemical Society Transactions*, **25**, 200–204 (review).
- Cabib, E., Roh, D.H., Schmidt, M., Crotti, L.B., and Varma, A. (2001) The yeast cell wall and septum as paradigms of cell growth and morphogenesis. *The Journal of Biological Chemistry*, **276**, 19679–19682.
- Cabral, F. and Schatz, G. (1979) High resolution one- and two-dimensional electrophoretic analysis of mitochondrial membrane polypeptides. *Methods in Enzymology*, **56**, 602–613.
- Cabral, F., Solioz, M., Rudin, Y., Schatz, G., Clavilier, L., and Slonimski, P.P. (1978) Identification of the structural gene for yeast cytochrome *c* oxidase subunit II on mitochondrial DNA. *The Journal of Biological Chemistry*, **253**, 297–304.
- Cabrera, M. and Ungermann, C. (2008) Purification and *in vitro* analysis of yeast vacuoles. *Methods in Enzymology*, **451**, 177–96.
- Cagney, G. (2009) Interaction networks: lessons from large-scale studies in yeast. *Proteomics*, **9**, 4799–4811.
- Cai, H., Zhang, Y., Pypaert, M., Walker, L., and Ferro-Novick, S. (2005) Mutants in trs120 disrupt traffic from the early endosome to the late Golgi. *The Journal of Cell Biology*, **171**, 823–833.
- Cai, J., Zhao, R., Jiang, H., and Wang, W. (2008a) *De novo* origination of a new protein-coding gene in *Saccharomyces cerevisiae*. *Genetics*, **179**, 487–496.
- Cai, L., Friedman, N., and Xie, X.S. (2006) Stochastic protein expression in individual cells at the single molecule level. *Nature*, **440**, 358–362.
- Cai, Y., Chin, H.F., Lazarova, D. *et al.* (2008b) The structural basis for activation of the Rab Ypt1p by the TRAPP membrane-tethering complexes. *Cell*, **133**, 1202–1213.
- Cairns, B.R., Kim, Y.J., Sayre, M.H., Laurent, B. C., and Kornberg, R.D. (1994) A multisubunit complex containing the SWI1/ADR6, SWI2/SNF2, SWI3, SNF5, and SNF6 gene products isolated from yeast. *Proceedings of the National Academy of Sciences of the United States of America*, **91**, 1950–1954.
- Cairns, B.R., Lorch, Y., Li, Y. *et al.* (1996) RSC, an essential, abundant chromatin-remodeling complex. *Cell*, **87**, 1249–1260.
- Cairns, B.R., Schlichter, A., Erdjument-Bromage, H., Tempst, P., Kornberg, R.D., and Winston, F. (1999) Two functionally distinct forms of the RSC nucleosome-remodeling complex, containing essential AT hook, BAH, and bromodomains. *Molecular Cell*, **4**, 715–723.
- Calabrese, V., Lodi, R., Tonon, C. *et al.* (2005) Oxidative stress, mitochondrial dysfunction and cellular stress response in Friedreich's ataxia. *Journal of the Neurological Sciences*, **233**, 145–162.
- Calero, F., Gomez, N., Arino, J., and Ramos, J. (2000) Trk1 and Trk2 define the major K⁺ transport system in fission yeast. *Journal of Bacteriology*, **182**, 394–399.
- Calvo, O. and Manley, J.L. (2003) Strange bedfellows: polyadenylation factors at the promoter. *Genes and Development*, **17**, 1321–1327.
- Calvo, O. and Manley, J.L. (2005) The transcriptional coactivator PC4/Sub1 has multiple functions in RNA polymerase II transcription. *The EMBO Journal*, **24**, 1009–1020.
- Cameron, J.R., Loh, E.Y., and Davis, R.W. (1979) Evidence for transposition of dispersed repetitive DNA families in yeast. *Cell*, **16**, 739–751.
- Camier, S., Gabrielsen, O., Baker, R., and Sentenac, A. (1985) A split binding site for transcription factor tau on the tRNA^{3Glu} gene. *The EMBO Journal*, **4**, 491–500.
- Camier, S., Baker, R.E., and Sentenac, A. (1990) On the flexible interaction of yeast factor tau with the bipartite promoter of tRNA genes. *Nucleic Acids Research*, **18**, 4571–4578.
- Camier, S., Dechampesme, A.M., and Sentenac, A. (1995) The only essential function of

- TFIIIA in yeast is the transcription of 5S rRNA genes. *Proceedings of the National Academy of Sciences of the United States of America*, **92**, 9338–9342.
- Campbell, I., and Duffus, J. H., (Editors), *Yeast: A Practical Approach*. IRL Press, Oxford-Washington 1988. ISBN: 0947946799.
- Campbell, J.L. and Schekman, R. (1997) Selective packaging of cargo molecules into endoplasmic reticulum-derived COPII vesicles. *Proceedings of the National Academy of Sciences of the United States of America*, **94**, 837–842.
- Campbell, R.E., Tour, O., Palmer, A.E. *et al.* (2002) A monomeric red fluorescent protein. *Proceedings of the National Academy of Sciences of the United States of America*, **99**, 7877–7882.
- Cang, Y. and Prelich, G. (2002) Direct stimulation of transcription by negative cofactor 2 (NC2) through TATA-binding protein (TBP). *Proceedings of the National Academy of Sciences of the United States of America*, **99**, 12727–12732.
- Cao, K. and Zheng, Y. (2004) The Cdc48/p97–Ufd1–Npl4 complex: its potential role in coordinating cellular morphogenesis during the M–G₁ transition. *Cell Cycle (Georgetown, Tex.)*, **3**, 422–424.
- Cao, Y., Cairns, B.R., Kornberg, R.D., and Laurent, B.C. (1997) Sfh1p, a component of a novel chromatin-remodeling complex, is required for cell cycle progression. *Molecular and Cellular Biology*, **17**, 3323–3334.
- Cao, K., Nakajima, R., Meyer, H.H., and Zheng, Y. (2003) The AAA-ATPase Cdc48/p97 regulates spindle disassembly at the end of mitosis. *Cell*, **115**, 355–367.
- Carbon, J. and Clarke, L. (1990) Centromere structure and function in budding and fission yeasts. *The New Biologist*, **2**, 10–19.
- Cardenas, M.E. and Heitman, J. (1995) FKBP12-rapamycin target TOR2 is a vacuolar protein with an associated phosphatidylinositol-4 kinase activity. *The EMBO Journal*, **14**, 5892–5907.
- Cardenas, M.E., Cutler, N.S., Lorenz, M.C., DiComo, C.J., and Heitman, J. (1999) The TOR signaling cascade regulates gene expression in response to nutrients. *Genes and Development*, **13**, 3271–3279.
- Carignani, G., Groudinsky, O., Frezza, D., Schiavon, E., Bergantino, E., and Slonimski, P.P. (1983) An mRNA maturase is encoded by the first intron of the mitochondrial gene for the subunit I of cytochrome oxidase in *S. cerevisiae*. *Cell*, **35**, 733–742.
- Carle, G.F. and Olson, M.V. (1985) An electrophoretic karyotype for yeast. *Proceedings of the National Academy of Sciences of the United States of America*, **82**, 3756–3760.
- Carles, C., Treich, I., Bouet, F., Riva, M., and Sentenac, A. (1991) Two additional common subunits, ABC10 alpha and ABC10 beta, are shared by yeast RNA polymerases. *The Journal of Biological Chemistry*, **266**, 24092–24096.
- Carlile, C.M., Pickart, C.M., Matunis, M.J., and Cohen, R.E. (2009) Synthesis of free and proliferating cell nuclear antigen-bound polyubiquitin chains by the RING E3 ubiquitin ligase Rad5. *The Journal of Biological Chemistry*, **284**, 29326–29334.
- Carlile, T.M. and Amon, A. (2008) Meiosis I is established through division-specific translational control of a cyclin. *Cell*, **133**, 280–291.
- Carlson, M. and Botstein, D. (1983) Organization of the SUC gene family in *S. cerevisiae*. *Molecular and Cellular Biology*, **3**, 351–359.
- Carlson, M. and Laurent, B.C. (1994) The SNF/SWI family of global transcriptional activators. *Current Opinion in Cell Biology*, **6**, 396–402 (review).
- Carlson, M., Osmond, B.C., and Botstein, D. (1981) SUC genes of yeast: a dispersed gene family. *Cold Spring Harbor Symposia on Quantitative Biology*, **45**, 799–803.
- Carlson, M., Taussig, R., Kustu, S., and Botstein, D. (1983) The secreted form of invertase in *Saccharomyces cerevisiae* is synthesized from mRNA encoding a signal sequence. *Molecular and Cellular Biology*, **3**, 439–447.
- Carlson, M. (1997) Genetics of transcriptional regulation in yeast. Connections to the RNA polymerase II CTD. *Annual Review of Cell and Developmental Biology*, **13**, 1–23.
- Carlson, M. (1998) Regulation of glucose utilization in yeast. *Current Opinion in Genetics & Development*, **8**, 560–564.
- Carlson, M. (1999) Glucose repression in yeast. *Current Opinion in Microbiology*, **2**, 202–207 (review).
- Carmona-Gutierrez, D., Eisenberg, T., Buttner, S., Meisinger, C., Kroemer, G., and Madeo, F. (2010) Apoptosis in yeast: triggers, pathways, subroutines. *Cell Death and Differentiation*, **17**, 763–773.
- Carter, G.W., Rush, C.G., Uygun, F., Sakhanenko, N.A., Galas, D.J., and Galitski, T. (2010) A systems-biology approach to modular genetic complexity. *Chaos*, **20**, 026102.
- Carvalho, P., Goder, V., and Rapoport, T.A. (2006) Distinct ubiquitin–ligase complexes define convergent pathways for the degradation of ER proteins. *Cell*, **126**, 361–373.
- Casamayor, A. and Snyder, M. (2002) Bud-site selection and cell polarity in budding yeast. *Current Opinion in Microbiology*, **5**, 179–186.
- Casamayor, A. and Snyder, M. (2003) Molecular dissection of a yeast septin: distinct domains are required for septin interaction, localization, and function. *Molecular and Cellular Biology*, **23**, 2762–2777.
- Casanova, J.E. (2007) Regulation of Arf activation: the Sec7 family of guanine nucleotide exchange factors. *Traffic (Copenhagen, Denmark)*, **8**, 1476–1485.
- Casaregola, S., Feynerol, C., Diez, M., Fournier, P., and Gaillardin, C. (1997) Genomic organization of the yeast *Yarrowia lipolytica*. *Chromosoma*, **106**380–390.
- Casaregola, S., Lépingle, A., Bon, E. *et al.* (2000) Genomics exploration of the hemiascomycetous yeasts, 7. *Saccharomyces servazzii*. *FEBS Letters*, **487**, 47–51.
- Casaregola, S., Weiss, S., and Morel, G. (2011) New perspectives in hemiascomycetous yeast taxonomy. *Comptes Rendus Biologies*, **334**, 590–598.
- Casari, G., DeFusco, M., Ciarmatori, S. *et al.* (1998) Spastic paraplegia and OXPHOS impairment caused by mutations in paraplegin, a nuclear-encoded mitochondrial metalloprotease. *Cell*, **93**, 973–983.
- Casey, F., Krogan, N., Shields, D.C., and Cagney, G. (2011) Distinct configurations of protein complexes and biochemical pathways revealed by epistatic interaction network motifs. *BMC Systems Biology*, **5**, e133.
- Castano, I., Kaur, R., Pan, S. *et al.* (2003) Th7-based genome-wide random insertional mutagenesis of *Candida glabrata*. *Genome Research*, **13**, 905–915.
- Castano, I., Pan, S.J., Zupancic, M., Hennequin, C., Dujon, B., and Cormack, B.P. (2005) Telomere length control and transcriptional regulation of subtelomeric adhesins in *Candida glabrata*. *Molecular Microbiology*, **55**, 1246–1258.
- Castrillo, J.I., Zeef, L.A., Hoyle, D.C. *et al.* (2007) Growth control of the eukaryote cell: a systems biology study in yeast. *Journal of Biology*, **6**, 4.
- Catley, B.J. (1988) Isolation and analysis of cell walls, in *Yeast: A Practical Approach*, IRL Press, Oxford, pp. 163–183.
- Catty, P., deKerchove d’Exaerde, A.D., and Goffeau, A. (1997) The complete inventory of the yeast *Saccharomyces cerevisiae* P-type transport ATPases. *FEBS Letters*, **409**, 325–332.
- Causton, H.C., Ren, B., Koh, S.S. *et al.* (2001) Identification of novel pheromone-response regulators through systematic overexpression of 120 protein kinases in yeast. *The Journal of Biological Chemistry*, **276**, 26472–26478.
- Cebollero, E. and Reggiori, F. (2009) Regulation of autophagy in the yeast *Saccharomyces cerevisiae*. *Biochimica et Biophysica Acta*, **1793**, 1413–1421.
- Cebulski, J., Malouin, J., Pinches, N., Cascio, V., and Austriaco, N. (2011) Yeast bax inhibitor, Bxi1p, is an ER-localized protein that links the unfolded protein response and programmed cell death in *Saccharomyces cerevisiae*. *PLoS One*, **6**, e20882.
- Celis, J.E., Kruhoffer, M., Gromova, I. *et al.* (2000) Gene expression profiling: monitoring transcription and translation products using DNA microarrays and proteomics. *FEBS Letters*, **480**, 2–16.
- Celińska, E. (2010) Debottlenecking the 1,3-propanediol pathway by metabolic engineering. *Biotechnology Advances*, **28**, 519–530 (review).
- Cenciarelli, C., Chiaur, D.S., Guardavaccaro, D., Parks, W., Vidal, M., and Pagano, M. (1999) Identification of a family of human F-box proteins. *Current Biology*, **9**, 1177–1179.
- Cervený, K.L., McCaffery, J.M., and Jensen, R.E. (2001) Division of mitochondria requires a novel DMN1 interacting protein, Net2p. *Molecular Biology of the Cell*, **12**, 309–321.
- Chacinska, A., Pfannschmidt, S., Wiedemann, N. *et al.* (2004) Essential role of Mia40 in import and assembly of mitochondrial intermembrane space proteins. *The EMBO Journal*, **23**, 3735–3746.
- Chacinska, A., Lind, M., Frazier, A.E. *et al.* (2005) Mitochondrial presequence translocase: switching between TOM tethering and motor recruitment involves Tim21 and Tim17. *Cell*, **120**, 817–829.
- Chae, H.J., Ke, N., Kim, H.R. *et al.* (2003) Evolutionarily conserved cytoprotection

- provided by Bax inhibitor-1 homologs from animals, plants, and yeast. *Genetics*, **323**, 101–113.
- Chalker, D.L. and Sandmeyer, S.B. (1992) Ty3 integrates within the region of RNA polymerase III transcription initiation. *Genes and Development*, **6**, 117–128.
- Chambers, S.R., Hunter, N., Louis, E.J., and Borts, R.H. (1996) The mismatch repair system reduces meiotic homeologous recombination and stimulates recombination-dependent chromosome loss. *Molecular and Cellular Biology*, **16**, 6110–6120.
- Chan, C.S. and Tye, B.K. (1980) Autonomously replicating sequences in *Saccharomyces cerevisiae*. *Proceedings of the National Academy of Sciences of the United States of America*, **77**, 6329–6333.
- Chang, J., Mast, F.D., Fagarasanu, A. *et al.* (2009) Pex3 peroxisome biogenesis proteins function in peroxisome inheritance as class V myosin receptors. *The Journal of Cell Biology*, **187**, 233–246.
- Chant, J. and Herskowitz, I. (1991) Genetic control of bud site selection in yeast by a set of gene products that constitute a morphogenetic pathway. *Cell*, **65**, 1203–1212.
- Chant, J., Corrado, K., Pringle, J.R., and Herskowitz, I. (1991) Yeast BUD5, encoding a putative GDP–GTP exchange factor, is necessary for bud site selection and interacts with bud formation gene BEM1. *Cell*, **65**, 1213–1224.
- Chant, J., Mischke, M., Mitchell, E., Herskowitz, I., and Pringle, J.R. (1995) Role of Bud3p in producing the axial budding pattern of yeast. *The Journal of Cell Biology*, **129**, 767–778.
- Chao, D.M., Gadbois, E.L., Murray, P.J. *et al.* (1996) A mammalian SRB protein associated with an RNA polymerase II holoenzyme. *Nature*, **380**, 82–85.
- Chao, J.T., Foster, L.J., and Loewen, C.J. (2009) Identification of protein complexes with quantitative proteomics in *S. cerevisiae*. *Journal of Visualized Experiments* **4**, pii:1225.
- Charbit, A., Boulain, J.C., Rytter, A., and Hofnung, M. (1986) Probing the topology of a bacterial membrane protein by genetic insertion of a foreign epitope; expression at the cell surface. *The EMBO Journal*, **5**, 3029–3037.
- Chasman, D.I., Flaherty, K.M., Sharp, P.A., and Kornberg, R.D. (1993) Crystal structure of yeast TATA-binding protein and model for interaction with DNA. *Proceedings of the National Academy of Sciences of the United States of America*, **90**, 8174–8178.
- Chasse, S.A., Flanary, P., Parnell, S.C. *et al.* (2006) Genome-scale analysis reveals Sst2 as the principal regulator of mating pheromone signaling in the yeast *Saccharomyces cerevisiae*. *Eukaryotic Cell*, **5**, 330–346.
- Chau, V., Tobias, J.W., Bachmair, A. *et al.* (1989) A multiubiquitin chain is confined to specific lysine in a targeted short-lived protein. *Science*, **243**, 1576–1583.
- Chechik, G., Oh, E., Rando, O., Weissman, J., Regev, A., and Koller, D. (2008) Activity motifs reveal principles of timing in transcriptional control of the yeast metabolic network. *Nature Biotechnology*, **26**, 1251–1259.
- Chedin, S., Ferri, M.L., Peyroche, G. *et al.* (1998) The yeast RNA polymerase III transcription machinery: a paradigm for eukaryotic gene activation. *Cold Spring Harbor Symposia on Quantitative Biology*, **63**, 381–389 (review).
- Cheeseman, I.M. and Desai, A. (2004) Cell division: AAAacking the mitotic spindle. *Current Biology*, **14**, R70–R72 (review).
- Chen, R. and Snyder, M. (2010) Yeast proteomics and protein microarrays. *Journal of Proteomics*, **73**, 2147–2157.
- Chen, R.E. and Thorner, J. (2007) Function and regulation in MAPK signaling pathways: lessons learned from the yeast *Saccharomyces cerevisiae*. *Biochimica et Biophysica Acta*, **1773**, 1311–1340.
- Chen, X.J., Saliola, M., Falcone, C., Bianchi, M. M., and Fukuhara, H. (1986) Sequence organization of the circular plasmid pKD1 from the yeast *Kluyveromyces drosophilorum*. *Nucleic Acids Research*, **14**, 4471–4481.
- Chen, X.J., Cong, Y.S., Wesolowski, M., Li, Y.Y., and Fukuhara, H. (1992) Characterization of a circular plasmid from the yeast *Kluyveromyces waltii*. *Journal of General Microbiology*, **138**, 337–345.
- Chen, J., Rappsilber, J., Chiang, Y.C., Russell, P., Mann, M., and Denis, C.L. (2001) Purification and characterization of the 1.0 MDa CCR4–NOT complex identifies two novel components of the complex. *Journal of Molecular Biology*, **314**, 683–694.
- Chen, O.S., Hemenway, S., and Kaplan, J. (2002) Inhibition of Fe–S cluster biosynthesis decreases mitochondrial iron export: evidence that Yfh1p affects Fe–S cluster synthesis. *Proceedings of the National Academy of Sciences of the United States of America*, **99**, 12321–12326.
- Chen, E.S., Sutani, T., and Yanagida, M. (2004) Cti1/C1D interacts with condensin SMC hinge and supports the DNA repair function of condensin. *Proceedings of the National Academy of Sciences of the United States of America*, **101**, 8078–8083.
- Chenevert, J., Corrado, K., Bender, A., Pringle, J., and Herskowitz, I. (1992) A yeast gene (BEM1) necessary for cell polarization whose product contains two SH3 domains. *Nature*, **356**, 77–79.
- Chenevert, J., Valtz, N., and Herskowitz, I. (1994) Identification of genes required for normal pheromone-induced cell polarization in *Saccharomyces cerevisiae*. *Genetics*, **136**, 1287–1296.
- Cheng, M.Y., Hartl, F.U., Martin, J. *et al.* (1989) Mitochondrial heat-shock protein hsp60 is essential for assembly of proteins imported into yeast mitochondria. *Nature*, **337**, 620–625.
- Cheng, H., He, X., and Moore, C. (2004) The essential WD repeat protein Swd2 has dual functions in RNA polymerase II transcription termination and lysine 4 methylation of histone H3. *Molecular and Cellular Biology*, **24**, 2932–2943.
- Cheng, C., Fabrizio, P., Ge, H., Longo, V.D., and Li, L.M. (2007a) Inference of transcription modification in long-lived yeast strains from their expression profiles. *BMC Genomics*, **8**, 219.
- Cheng, X., Dunaway, S., and Ivessa, A.S. (2007b) The role of Pif1p, a DNA helicase in *Saccharomyces cerevisiae*, in maintaining mitochondrial DNA. *Mitochondrion*, **7**, 211–222.
- Chernoff, Y.O., Lindquist, S.L., Ono, B., Inge-Vechtomov, S.G., and Liebman, S.W. (1995) Role of the chaperone protein Hsp104 in propagation of the yeast prion-like factor [PSI]. *Science*, **268**, 880–884.
- Cherry, J.M., Ball, C., Weng, S. *et al.* (1997) Genetic and physical maps of *Saccharomyces cerevisiae*. *Nature*, **387**, 67–74.
- Cheung, K.L.Y., Huen, J., Houry, W.A., and Ortega, J. (2010) Comparison of the multiple oligomeric structures observed for the Rvb1 and Rvb2 proteins. *Biochemistry and Cell Biology*, **88**, 77–88.
- Chiang, H.L. and Schekman, R. (1991) Regulated import and degradation of a cytosolic protein in the yeast vacuole. *Nature*, **350**, 313–318.
- Chiang, H.L., Schekman, R., and Hamamoto, S. (1996) Selective uptake of cytosolic, peroxisomal, and plasma membrane proteins into the yeast lysosome for degradation. *The Journal of Biological Chemistry*, **271**, 9934–9941.
- Chiang, D.Y., Moses, A.M., Kellis, M., Lander, E. S., and Eisen, M.B. (2003) Phylogenetically and spatially conserved word pairs associated with gene-expression changes in yeasts. *Genome Biology*, **4**, R43.
- Chiannilkulchai, N., Stalder, R., Riva, M., Carles, C., Werner, M., and Sentenac, A. (1992) RPC82 encodes the highly conserved, third-largest subunit of RNA polymerase C (III) from *Saccharomyces cerevisiae*. *Molecular and Cellular Biology*, **12**, 4433–4440.
- Chiba, Y. and Akeboshi, H. (2009) Glycan engineering and production of “humanized” glycoprotein in yeast cells. *Biological & Pharmaceutical Bulletin*, **32**, 786–795 (review).
- Chiba, T. and Tanaka, K. (2004) Cullin-based ubiquitin ligase and its control by NEDD8-conjugating system. *Current Protein & Peptide Science*, **5**, 177–84.
- Chiba, Y., Sakuraba, H., Kotani, M. *et al.* (2002) Production in yeast of alpha-galactosidase A, a lysosomal enzyme applicable to enzyme replacement therapy for Fabry disease. *Glycobiology*, **12**, 821–828.
- Chibana, H. and Magee, P.T. (2009) The enigma of the major repeat sequence of *Candida albicans*. *Future Microbiology*, **4**, 171–179.
- Chibana, H., Magee, B.B., Grindler, S., Ran, Y., Scherer, S., and Magee, P.T. (1998) A physical map of chromosome 7 of *Candida albicans*. *Genetics*, **149**, 1739–1752.
- Childress, A.M., Franklin, D.S., Pinswasdi, C., and Kale, S. (1996) LAG2, a gene that determines yeast longevity. *Microbiology (Reading, England)*, **142**, 2289–2297.
- Chinault, A.C. and Carbon, J. (1979) Overlap hybridization screening: isolation and characterization of overlapping DNA fragments surrounding the *leu2* gene on yeast chromosome III. *Genetics*, **5**, 111–126.
- Chiolo, I., Carotenuto, W., Maffioletti, G., Petrini, J.H., Foiani, M., and Liberi, G. (2005) Srs2 and Sgs1 DNA helicases associate with Mre11 in different subcomplexes following checkpoint activation and CDK1-mediated Srs2 phosphorylation. *Molecular and Cellular Biology*, **25**, 5738–5751.
- Chodosh, L.A., Olesen, J., Hahn, S., Baldwin, A. S., Guarente, L., and Sharp, P.A. (1988) A yeast and a human CCAAT-binding protein have heterologous subunits that are

- functionally interchangeable. *Cell*, **53**, 25–35.
- Choi, Y.S., Yang, J.S., Choi, Y., Ryu, S.H., and Kim, S. (2009) Evolutionary conservation in multiple faces of protein interaction. *Proteins*, **77**, 14–25.
- Chong, S., Shao, Y., Paulus, H., Benner, J., Perler, F.B., and Xu, M.Q. (1996) Protein splicing involving the *Saccharomyces cerevisiae* VMA intein. The steps in the splicing pathway, side reactions leading to protein cleavage, and establishment of an *in vitro* splicing system. *The Journal of Biological Chemistry*, **271**, 22159–22168.
- Chong, S., Williams, K.S., Wotkowicz, C., and Xu, M.Q. (1998) Modulation of protein splicing of the *Saccharomyces cerevisiae* vacuolar membrane ATPase intein. *The Journal of Biological Chemistry*, **273**, 10567–10577.
- Chook, Y.M. and Blobel, G. (2001) Karyopherins and nuclear import. *Current Opinion in Structural Biology*, **11**, 703–715.
- Christen, S. and Sauer, U. (2011) Intracellular characterization of aerobic glucose metabolism in seven yeast species by ¹³C flux analysis and metabolomics. *FEMS Yeast Research*, **11**, 263–272.
- Christianson, T.W., Sikorski, R.S., Dante, M., Shero, J.H., and Hieter, P. (1992) Multifunctional yeast high-copy-number shuttle vectors. *Genetics*, **110**, 119–122.
- Chu, S. and Herskowitz, I. (1998) Gametogenesis in yeast is regulated by a transcriptional cascade dependent on Ndt80. *Molecular Cell*, **1**, 685–696.
- Chu, S., DeRisi, J., Eisen, M. *et al.* (1998) The transcriptional program of sporulation in budding yeast. *Science*, **282**, 699–705.
- Chuang, J.S. and Schekman, R.W. (1996) Differential trafficking and timed localization of two chitin synthase proteins, Chs2p and Chs3p. *The Journal of Cell Biology*, **135**, 597–610.
- Chung, H.R. and Vingron, M. (2009) Sequence-dependent nucleosome positioning. *Journal of Molecular Biology*, **386**, 1411–1422.
- Church, G.M., Slonimski, P.P., and Gilbert, W. (1979) Pleiotropic mutations within two yeast mitochondrial cytochrome genes block mRNA processing. *Cell*, **18**, 1209–1215.
- Cid, V.J., Duran, A., del Rey, F., Snyder, M.P., Nombela, C., and Sanchez, M. (1995) Molecular basis of cell integrity and morphogenesis in *Saccharomyces cerevisiae*. *Microbiological Reviews*, **59**, 345–386 (review).
- Cid, V.J., Shulewitz, M.J., McDonald, K.L., and Thorne, J. (2001) Dynamic localization of the Swe1 regulator Hsl7 during the *Saccharomyces cerevisiae* cell cycle. *Molecular Biology of the Cell*, **12**, 1645–1669.
- Cid, V.J., Jimenez, J., Molina, M., Sanchez, M., Nombela, C., and Thorne, J.W. (2002) Orchestrating the cell cycle in yeast: sequential localization of key mitotic regulators at the spindle pole and the bud neck. *Microbiology (Reading, England)*, **148**, 2647–2659.
- Ciechanover, A. and Hershko, A. (1976) Early effects of serum on phospholipid metabolism in untransformed and oncogenic virus-transformed cultured fibroblasts. *Biochemical and Biophysical Research Communications*, **73**, 85–91.
- Ciechanover, A., Finley, D., and Varshavsky, A. (1984a) The ubiquitin-mediated proteolytic pathway and mechanisms of energy-dependent intracellular protein degradation. *Journal of Cellular Biochemistry*, **24**, 27–53 (review).
- Ciechanover, A., Finley, D., and Varshavsky, A. (1984b) Ubiquitin dependence of selective protein degradation demonstrated in the mammalian cell cycle mutant ts85. *Cell*, **37**, 57–66.
- Ciechanover, A. (2004) *Intracellular protein degradation: from a vague idea thru the lysosome and the ubiquitin-proteasome system and onto human diseases and drug targeting*. Nobel Lecture, December 8, 2004, http://nobelprize.org/nobel_prizes/chemistry/laureates/2004/ciechanover-lecture.html.
- Ciferri, C., Musacchio, A., and Petrovic, A. (2007) The Ndc80 complex: hub of kinetochore activity. *FEBS Letters*, **581**, 2862–2869.
- Cigan, A.M., Fioani, M., Hannig, E.M., and Hinnebusch, A.G. (1991) Complex formation by positive and negative translational regulators of GCN4. *Molecular and Cellular Biology*, **11**, 3217–3228.
- Ciosk, R., Zachariae, W., Michaelis, C., Shevchenko, A., Mann, M., and Nasmyth, K. (1998) An *ESP1/PDS1* complex regulates loss of sister chromatid cohesion at the metaphase to anaphase transition in yeast. *Cell*, **93**, 1067–1076.
- Ciosk, R., Shirayama, M., Shevchenko, A. *et al.* (2000) Cohesin's binding to chromosomes depends on a separate complex consisting of Scc2 and Scc4 proteins. *Molecular Cell*, **5**, 243–254.
- Clapier, C.R. and Cairns, B.R. (2009) The biology of chromatin remodeling complexes. *Annual Review of Biochemistry*, **78**, 273–304.
- Clare, J. and Farabaugh, P. (1985) Nucleotide sequence of a yeast Ty element: evidence for an unusual mechanism of gene expression. *Proceedings of the National Academy of Sciences of the United States of America*, **82**, 2829–2833.
- Clarke, L. and Carbon, J. (1976) A colony bank containing synthetic Col EI hybrid plasmids representative of the entire *E. coli* genome. *Biotechnology*, **24**, 179–187.
- Clarkson, S.G., Birnstiel, M.L., and Purdom, I.F. (1973) Clustering of transfer RNA genes of *Xenopus laevis*. *Journal of Molecular Biology*, **79**, 411–429.
- Clary, D.O., Griff, I.C., and Rothman, J.E. (1990) SNAPS, a family of NSF attachment proteins involved in intracellular membrane fusion in animals and yeast. *Cell*, **61**, 709–721.
- Cliften, P., Sudarsanam, P., Desikan, A. *et al.* (2003) Finding functional features in *Saccharomyces* genomes by phylogenetic footprinting. *Science*, **301**, 71–76.
- Cliften, P.F., Fulton, R.S., Wilson, R.K., and Johnston, M. (2006) After the duplication, gene loss and adaptation in *Saccharomyces* genomes. *Genetics*, **172**, 863–872.
- Clyne, R.K., Katis, V.L., Jessop, L. *et al.* (2003) Polo-like kinase Cdc5 promotes chiasmata formation and cosegregation of sister centromeres at meiosis I. *Nature Cell Biology*, **5**, 480–485.
- Cocker, J.H., Piatti, S., Santocanale, C., Nasmyth, K., and Diffley, J.F. (1996) An essential role for the Cdc6 protein in forming the pre-replicative complexes of budding yeast. *Nature*, **379**, 180–182.
- Coen, D., Deutsch, J., Netter, P., Petrochilo, E., and Slonimski, P.P. (1970) Mitochondrial genetics in yeast. I. Methodology and phenomenology. *Symposia of the Society for Experimental Biology*, **24**, 449–496.
- Cohen, G., Fessl, F., Traczyk, A., Rytka, J., and Ruis, H. (1985) Isolation of the catalase A gene of *Saccharomyces cerevisiae* by complementation of the *cta1* mutation. *Molecular & General Genetics*, **200**, 74–79.
- Cohen, B.A., Pilpel, Y.P., Mitra, R.D., and Church, G.M. (2002) Discrimination between paralogs using microarray analysis: application to the Yap1p and Yap2p transcriptional networks. *Molecular Biology of the Cell*, **13**, 1608–1614.
- Cohen, M., Stutz, F., Belgareh, N., Haguenaer-Tsapis, R., and Dargemont, C. (2003) Ubp3 requires a cofactor, Bre5, to specifically deubiquitinate the COPII protein, Sec23. *Nature Cell Biology*, **5**, 661–667.
- Cohen-Fix, O. and Koshland, D. (1997) The anaphase inhibitor of *Saccharomyces cerevisiae* Pds1p is a target of the DNA damage checkpoint pathway. *Proceedings of the National Academy of Sciences of the United States of America*, **94**, 14361–14366.
- Cohen-Fix, O., Peters, J.M., Kirschner, M.W., and Koshland, D. (1996) Anaphase initiation in *Saccharomyces cerevisiae* is controlled by the APC-dependent degradation of the anaphase inhibitor Pds1p. *Genes and Development*, **10**, 3081–3093.
- Cohn, M. and Blackburn, E.H. (1995) Telomerase in yeast. *Science*, **269**, 396–400.
- Cohn, M., McEachern, M.J., and Blackburn, E.H. (1998) Telomeric sequence diversity within the genus *Saccharomyces*. *Current Genetics*, **33**, 83–91.
- Cokus, S., Rose, S., Haynor, D., Grünbech-Jensen, N., and Pellegrini, M. (2006) Modelling the network of cell cycle transcription factors in the yeast *Saccharomyces cerevisiae*. *BMC Bioinformatics*, **7**, 381–392.
- Colavito, S., Prakash, R., and Sung, P. (2010) Promotion and regulation of homologous recombination by DNA helicases. *Methods (San Diego, Calif.)*, **51**, 329–335.
- Coleman, K.G., Steensma, H.Y., Kaback, D.B., and Pringle, J.R. (1986) Molecular cloning of chromosome I DNA from *Saccharomyces cerevisiae*: isolation and characterization of the CDC24 gene and adjacent regions of the chromosome. *Molecular and Cellular Biology*, **6**, 4516–4625.
- Collart, M.A. (2003) Global control of gene expression in yeast by the Ccr4–Not complex. *Genetics*, **313**, 1–16.
- Colleaux, L., d'Auriol, L., Betermier, M. *et al.* (1986) Universal code equivalent of a yeast mitochondrial intron reading frame is expressed into *E. coli* as a specific double strand endonuclease. *Cell*, **44**, 521–533.
- Collins, J. and Hohn, B. (1978) Cosmids: a type of plasmid gene-cloning vector that is packageable *in vitro* in bacteriophage lambda heads. *Proceedings of the National Academy of*

- Sciences of the United States of America*, **75**, 4242–4246.
- Colombo, S., Colombo, S., Ma, P. *et al.* (1998) Involvement of distinct G-proteins, Gpa2 and Ras, in glucose- and intracellular acidification-induced cAMP signalling in the yeast *Saccharomyces cerevisiae*. *The EMBO Journal*, **17**, 3326–3341.
- Coluccio, A., Bogengruber, E., Conrad, M.N., Dresser, M.E., Briza, P., and Neiman, A.M. (2004) Morphogenetic pathway of spore wall assembly in *Saccharomyces cerevisiae*. *Eukaryotic Cell*, **3**, 1464–1475.
- Conaway, J.W. and Conaway, R.C. (1989a) A multisubunit transcription factor essential for accurate initiation by RNA polymerase II. *The Journal of Biological Chemistry*, **264**, 2357–2362.
- Conaway, R.C. and Conaway, J.W. (1989b) An RNA polymerase II transcription factor has an associated DNA-dependent ATPase (dATPase) activity strongly stimulated by the TATA region of promoters. *Proceedings of the National Academy of Sciences of the United States of America*, **86**, 7356–7360.
- Conesa, C., Swanson, R.N., Schultz, P., Oudet, P., and Sentenac, A. (1993) On the subunit composition, stoichiometry, and phosphorylation of the yeast transcription factor TFIIC/tau. *The Journal of Biological Chemistry*, **268**, 18047–18052.
- Conibear, E. and Stevens, T.H. (1998) Multiple sorting pathways between the late Golgi and the vacuole in yeast. *Biochimica et Biophysica Acta*, **1404**, 211–230 (review).
- Conlan, R.S. and Tzamarias, D. (2001) Sfl1 functions via the co-repressor Ssn6–Tup1 and the cAMP-dependent protein kinase Tpk2. *Journal of Molecular Biology*, **309**, 1007–1015.
- Conlon, E.M., Liu, X.S., Lieb, J.D., and Liu, J.S. (2003) Integrating regulatory motif discovery and genome-wide expression analysis. *Proceedings of the National Academy of Sciences of the United States of America*, **100**, 3339–3344.
- Conrad, T.M., Lewis, N.E., and Palsson, B.O. (2011) Microbial laboratory evolution in the era of genome-scale science. *Molecular Systems Biology*, **7**, e509.
- Contag, C.H. and Bachmann, M.H. (2002) Advances in *in vivo* bioluminescence imaging of gene expression. *Annual Review of Biomedical Engineering*, **4**, 235–60.
- Conti, E. and Izaurralde, E. (2005) Nonsense-mediated mRNA decay: molecular insights and mechanistic variations across species. *Current Opinion in Cell Biology*, **17**, 316–325.
- Cook, A., Bono, F., Jinek, M., and Conti, E. (2007) Structural biology of nucleocytoplasmic transport. *Annual Review of Biochemistry*, **76**, 647–671.
- Cooper, A.A., Gitler, A.D., Cashikar, A. *et al.* (2006) Alpha-synuclein blocks ER–Golgi traffic and Rab1 rescues neuron loss in Parkinson's models. *Science*, **313**, 324–328.
- Cooper, T.G. (2002) Transmitting the signal of excess nitrogen in *Saccharomyces cerevisiae* from the Tor proteins to the GATA factors. *FEMS Microbiology Reviews*, **26**, 223–238.
- Cope, G.A., Suh, G.S.B., Aravind, L. *et al.* (2002) Role for predicted metalloprotease motif of JAB1/Csn5 in cleavage of NEDD8 from CUL1. *Science*, **298**, 608–611.
- Corbett, A.H., Koepp, D.M., Schlenstedt, G., Lee, M.S., Hopper, A.K., and Silver, P.A. (1995) Rna1p, a Ran/TC4 GTPase activating protein, is required for nuclear import. *The Journal of Cell Biology*, **130**, 1017–1026.
- Cormack, B.P. and Falkow, S. (1999) Efficient homologous and illegitimate recombination in the opportunistic yeast pathogen *Candida glabrata*. *Genetics*, **151**, 979–987.
- Cormack, B.P. and Struhl, K. (1992) The TATA-binding protein is required for transcription by all three nuclear RNA polymerases in yeast cells. *Cell*, **69**, 685–696.
- Corsi, A.K. and Schekman, R. (1996) Mechanism of polypeptide translocation into the endoplasmic reticulum. *The Journal of Biological Chemistry*, **271**, 30299–30302 (review).
- Cosma, M.P. (2004) Daughter-specific repression of *Saccharomyces cerevisiae* HO: Ash1 is the commander. *EMBO Reports*, **5**, 953–957.
- Costanzo, M., Baryshnikova, A., Bellay, J. *et al.* (2010) The genetic landscape of a cell. *Science*, **327**, 425–431.
- Courey, A.J. and Jia, S. (2001) Transcriptional repression: the long and the short of it. *Genes and Development*, **15**, 2786–2796 (review).
- Coux, O., Tanaka, K., and Goldberg, A.L. (1996) Structure and functions of the 20S and 26S proteasomes. *Annual Review of Biochemistry*, **65**, 801–847 (review).
- Cox, H., Mead, D., Sudbery, P., Eland, R.M., Mannazzu, I., and Evans, L. (2000) Constitutive expression of recombinant proteins in the methylotrophic yeast *Hansenula polymorpha* using the PMA1 promoter. *Yeast (Chichester, England)*, **16**, 1191–1203.
- Cox, B.S. (1965) PSI, a cytoplasmic suppressor of super-suppressor in yeast. *Heredity*, **26**, 211–232.
- Craig, K.L. and Tyers, M. (1999) The F-box: a new motif for ubiquitin dependent proteolysis in cell cycle regulation and signal transduction. *Progress in Biophysics and Molecular Biology*, **72**, 299–328.
- Creamer, T.J., Darby, M.M., Jamonnak, N. *et al.* (2011) Transcriptome-wide binding sites for components of the *Saccharomyces cerevisiae* non-poly(A) termination pathway, Nrd1, Nab3, and Sen1. *PLoS Genetics*, **7**, e1002329.
- Cregg, J.M., Tolstorukov, I., Kusari, A., Sunga, J., Madden, K., and Chappell, T. (2009) Expression in the yeast *Pichia pastoris*. *Methods in Enzymology*, **463**, 169–189.
- Crick, F.H.C. (1957) Discussion, in *The Structure of Nucleic Acids and Their Role in Protein Synthesis*, Biochemical Society Symposium No. 14, Cambridge University Press, Cambridge, pp. 25–26.
- Crick, F.H.C. (1966) The genetic code: yesterday, today, and tomorrow. *Cold Spring Harbor Symposia on Quantitative Biology*, **31**, 3–9.
- Cridde, R.S. and Schatz, G. (1969) Promitochondria of anaerobically grown yeast. I. Isolation and biochemical properties. *Biochemistry*, **8**, 322–334.
- Crow, E.T. and Li, L. (2011) Newly identified prions in budding yeast, and their possible functions. *Seminars in Cell & Developmental Biology*, **22**, 452–459.
- Cruz, J.A. and Westhof, E. (2011) Identification and annotation of noncoding RNAs in Saccharomycotina. *Comptes Rendus Biologies*, **334**, 671–678.
- Cullen, P.J. and Sprague, G.F.Jr (2000) Glucose depletion causes haploid invasive growth in yeast. *Proceedings of the National Academy of Sciences of the United States of America*, **97**, 13619–13624.
- Cullen, P.J., Sabbagh, W.Jr, Graham, E. *et al.* (2004) A signaling mucin at the head of the Cdc42- and MAPK-dependent filamentous growth pathway in yeast. *Genes and Development*, **18**, 1695–1708.
- Cullmann, G., Fien, K., Kobayashi, R., and Stillman, B. (1995) Characterization of the five replication factor C genes of *Saccharomyces cerevisiae*. *Molecular and Cellular Biology*, **15**, 4661–4671.
- Culver, G.M., McCraith, S.M., Zillmann, M. *et al.* (1993) An NAD derivative produced during transfer RNA splicing: ADP-ribose 1''–2'' cyclic phosphate. *Science*, **261**, 206–208.
- Cummings, C.J. and Zoghbi, H.Y. (2000) Fourteen and counting: unraveling trinucleotide repeat diseases. *Human Molecular Genetics*, **9**, 909–916.
- Curcio, M.J., Sanders, N.J., and Garfinkel, D.J. (1988) Transpositional competence and transcription of endogenous Ty elements in *Saccharomyces cerevisiae*: implications for regulation of transposition. *Molecular and Cellular Biology*, **8**, 3571–3581.
- Curto, R., Sorribas, A., and Cascante, M. (1995) Comparative characterization of the fermentation pathway of *Saccharomyces cerevisiae* using biochemical systems theory and metabolic control analysis: model definition and nomenclature. *Mathematical Biosciences*, **130**, 25–50.
- Czerucka, D., Piche, T., and Rampal, P. (2007) Yeast as probiotics – *Saccharomyces boulardii*. *Alimentary Pharmacology & Therapeutics*, **26**, 767–778.
- Czerwoniec, A., Dunin-Horkawicz, S., Purta, E. *et al.* (2009) MODOMICS: a database of RNA modification pathways. 2008 update. *Nucleic Acids Research*, **37**, D118–D121.
- D'Angelo, M.A. and Hetzer, M.W. (2008) Structure, dynamics and function of nuclear pore complexes. *Trends in Cell Biology*, **18**, 456–466.
- D'Angelo, M.A., Anderson, D.J., Richard, E., and Hetzer, M.W. (2006) Nuclear pores form *de novo* from both sides of the nuclear envelope. *Science*, **312**, 440–443.
- Dalal, Y., Furuyama, T., Vermaak, D., and Henikoff, S. (2007) Structure, dynamics, and evolution of centromeric nucleosomes. *Proceedings of the National Academy of Sciences of the United States of America*, **104**, 15974–15981.
- Damelin, M., Simon, I., Moy, T.I. *et al.* (2002) The genome-wide localization of Rsc9, a component of the RSC chromatin-remodeling complex, changes in response to stress. *Molecular Cell*, **9**, 563–573.
- Dames, S.A., Mulet, J.M., Rathgeb-Szabo, K., Hall, M.N., and Grzesiek, S. (2005) The solution structure of the FATC domain of the protein kinase target of rapamycin suggests a role for redox-dependent structural and cellular stability. *The Journal of Biological Chemistry*, **280**, 20558–20564.
- Daniel, J.A., Torok, M.S., Sun, Z.W., Schieltz, D., Allis, C.D., Yates, J.R.3rd, and Grant, P.A.

- (2004) Deubiquitination of histone H2B by a yeast acetyltransferase complex regulates transcription. *The Journal of Biological Chemistry*, **279**, 1867–1871.
- Daniel, J.A. and Grant, P.A. (2007) Multi-tasking on chromatin with the SAGA coactivator complexes. *Mutation Research*, **618**, 135–148.
- Daquinag, A., Fadri, M., Jung, S.Y., Qin, J., and Kunz, J. (2007) The yeast PH domain proteins Slm1 and Slm2 are targets of sphingolipid signaling during the response to heat stress. *Molecular and Cellular Biology*, **27**, 633–650.
- Darnell, J.E.Jr (1978) Implications of RNA–RNA splicing in evolution of eukaryotic cells. *Science*, **202**, 1257–1260.
- Darst, S.A., Kubalek, E.W., and Kornberg, R.D. (1989) Three-dimensional structure of *Escherichia coli* RNA polymerase holoenzyme determined by electron crystallography. *Nature*, **340**, 730–732.
- Darst, S.A., Edwards, A.M., Kubalek, E.W., and Kornberg, R.D. (1991) Three-dimensional structure of yeast RNA polymerase II at 16 Å resolution. *Cell*, **66**, 121–128.
- Dato, L., Branduardi, P., Passolunghi, S. *et al.* (2010) Advances in molecular tools for the use of *Zygosaccharomyces bailii* as host for biotechnological productions and construction of the first auxotrophic mutant. *FEMS Yeast Research*, **10**, 894–908.
- Davey, H.M. and Kell, D.B. (1996) Flow cytometry and cell sorting of heterogeneous microbial populations: the importance of single-cell analysis. *Microbiological Reviews*, **60**, 641–696.
- Davie, J.K., Edmondson, D.G., Coco, C.B., and Dent, S.Y. (2003) Tup1–Ssn6 interacts with multiple class I histone deacetylases *in vivo*. *The Journal of Biological Chemistry*, **278**, 50158–50162.
- Davies, C.J., Trgovcich, J., and Hutchison, C.A.3rd (1990) Homologue of TFIIS in yeast. *Nature*, **345**, 298.
- Davis, J.L., Kunisawa, R., and Thorner, J. (1992) A presumptive helicase (MOT1 gene product) affects gene expression and is required for viability in the yeast *Saccharomyces cerevisiae*. *Molecular and Cellular Biology*, **12**, 1879–1892.
- Davis, J.A., Takagi, Y., Kornberg, R.D., and Asturias, F.A. (2002) Structure of the yeast RNA polymerase II holoenzyme: mediator conformation and polymerase interaction. *Molecular Cell*, **10**, 409–415.
- Davis, T.N. (2004) Protein localization in proteomics. *Current Opinion in Chemical Biology*, **8**, 49–53.
- Dawson, T.R., Lazarus, M.D., Hetzer, M.W., and Wente, S.R. (2009) ER membrane-bending proteins are necessary for *de novo* nuclear pore formation. *The Journal of Cell Biology*, **184**, 659–675.
- De Antoni, A., Schmitzova, J., Trepte, H.H., Gallwitz, D., and Albert, S. (2002) Significance of GTP hydrolysis in Ypt1p-regulated endoplasmic reticulum to Golgi transport revealed by the analysis of two novel Ypt1-GAPs. *The Journal of Biological Chemistry*, **277**, 41023–41031.
- De Groot, P.W.J., Hellingwerf, K.J., and Klis, F.M. (2003) Genome-wide identification of fungal GPI proteins. *Yeast (Chichester, England)*, **20**, 781–796.
- De Groot, P.W., Kraneveld, E.A., Yin, Q.Y. *et al.* (2008) The cell wall of the human pathogen *Candida glabrata*, differential incorporation of novel adhesin-like wall proteins. *Eukaryotic Cell*, **7**, 1951–1964.
- De Hertogh, B., Carvajal, E., Talla, E., Dujon, B., Baret, P., and Goffeau, A. (2002) Phylogenetic classification of transporters and other membrane proteins from *Saccharomyces cerevisiae*. *Functional & Integrative Genomics*, **2**, 154–170 (review).
- De Hertogh, B., Hancy, F., Goffeau, A., and Baret, P.V. (2006) Emergence of species-specific transporters during evolution of the Hemiascomycete phylum. *Genetics*, **172**, 771–781.
- De la Cruz, J., Kressler, D., and Linder, P. (1999) Unwinding RNA in *Saccharomyces cerevisiae*: DEAD-box proteins and related families. *Trends in Biochemical Sciences*, **24**, 192–198.
- De La Salle, H., Jacq, C., and Slonimski, P.P. (1982) Critical sequences within mitochondrial introns: pleiotropic mRNA maturase and *cis*-dominant signals of the box intron controlling reductase and oxidase. *Cell*, **28**, 721–732.
- De Las Penas, A., Pan, S.J., Castano, I., Alder, J., Cregg, R., and Cormack, B.P. (2003) Virulence-related surface glycoproteins in the yeast pathogen *Candida glabrata* are encoded in subtelomeric clusters and subject to RAP1- and SIR-dependent transcriptional silencing. *Genes and Development*, **17**, 2245–2258.
- De Montigny, J., Spehner, C., Souciet, J. *et al.* (2000) Genomic exploration of the hemiascomycetous yeasts, 15. *Pichia sorbitophila*. *FEBS Letters*, **487**, 87–90.
- De Pamphilis, M.L. (1999) Replication origins in metazoan chromosomes, fact or fiction? *Bioessays*, **21**, 5–16.
- De Schutter, K., Lin, Y.-C., Tiels, P. *et al.* (2009) Genome sequence of the recombinant protein production host *Pichia pastoris*. *Nature Biotechnology*, **27**, 561–566.
- De Souza Pereira, R., Parizotto, N.A., and Baranauskas, J. (1996) Observation of baker's yeast strains used in biotransformation by atomic force microscopy. *Applied Biochemistry and Biotechnology*, **59**, 135–143.
- De Vos, A., Anandhakumar, J., Van den Brande, J. *et al.* (2011) Yeast as a model system to study tau biology. *International Journal of Alzheimer's Disease*, article ID 428970.
- De Zamaroczy, M. and Bernardi, G. (1986) The primary structure of the mitochondrial genome of *Saccharomyces cerevisiae* – a review. *Genetics*, **47**, 155–77.
- Dean, E.J., Davis, J.C., Davis, R.W., and Petrov, D.A. (2008) Pervasive and persistent redundancy among duplicated genes in yeast. *PLoS Genetics*, **4**, e1000113.
- Dejong, J.M., Liu, Y., Bollon, A.P. *et al.* (2006) Genetic engineering of taxol biosynthetic genes in *Saccharomyces cerevisiae*. *Biotechnology and Bioengineering*, **93**, 212–24.
- Del Vecovo, V., De Sanctis, V., Bianchi, A., Shore, D., Di Mauro, E., and Negri, R. (2004) Distinct DNA elements contribute to Rap1p affinity for its binding sites. *Journal of Molecular Biology*, **338**, 877–893.
- Delarue, M. (1995) Aminoacyl-tRNA synthetases. *Current Opinion in Structural Biology*, **5**, 48–55.
- Delaveau, T., Delahodde, A., Carvajal, E., Subik, J., and Jacq, C. (1994) *PDR3*, a new yeast regulatory gene, is homologous to *PDR1* and controls the multidrug resistance phenomenon. *Molecular & General Genetics*, **244**, 501–511.
- Dell'Angelica, E.C., Puertollano, R., Mullins, C. *et al.* (2000) GGAs: a family of ADP ribosylation factor-binding proteins related to adaptors and associated with the Golgi complex. *The Journal of Cell Biology*, **149**, 81–94.
- Dellomonaco, C., Fava, F., and Gonzalez, R. (2010) The path to next generation biofuels: successes and challenges in the era of synthetic biology. *Microbial Cell Factories*, **20**, 3 (review).
- Delneri, D., Colson, I., Grammenoudji, S., Roberts, I.N., Louis, E.J., and Oliver, S.G. (2003) Engineering evolution to study speciation in yeasts. *Nature*, **422**, 68–72.
- Deloche, O., Yeung, B.G., Payne, G.S., and Schekman, R. (2001) Vps10p transport from the *trans*-Golgi network to the endosome is mediated by clathrin-coated vesicles. *Molecular Biology of the Cell*, **12**, 475–485.
- DeMarini, D.J., Adams, A.E.M., Fares, H. *et al.* (1997) A septin-based hierarchy of proteins required for localized deposition of chitin in the *Saccharomyces cerevisiae* cell wall. *The Journal of Cell Biology*, **139**, 75–93.
- Demmel, L., Beck, M., Klose, C. *et al.* (2008a) Nucleocytoplasmic shuttling of the Golgi phosphatidylinositol 4-kinase Pik1 is regulated by 14-3-3 proteins and coordinates Golgi function with cell growth. *Molecular Biology of the Cell*, **19**, 1046–1061.
- Demmel, L., Gravert, M., Ercan, E. *et al.* (2008b) The clathrin adaptor Gga2p is a phosphatidylinositol 4-phosphate effector at the Golgi exit. *Molecular Biology of the Cell*, **19**, 1991–2002.
- D'Enfert, C., Barlowe, C., Nishikawa, S., Nakano, A., and Schekman, R. (1991a) Structural and functional dissection of a membrane glycoprotein required for vesicle budding from the endoplasmic reticulum. *Molecular and Cellular Biology*, **11**, 5727–5734.
- D'Enfert, C., Wuestehube, L.J., Lila, T., and Schekman, R. (1991b) Sec12p-dependent membrane binding of the small GTP-binding protein Sar1p promotes formation of transport vesicles from the ER. *The Journal of Cell Biology*, **114**, 663–670.
- Denis, C.L. and Chen, J. (2003) The CCR4–NOT complex plays diverse roles in mRNA metabolism. *Progress in Nucleic Acid Research and Molecular Biology*, **73**, 221–250.
- Dennis, P.B., Fumagalli, S., and Thomas, G. (1999) Target of rapamycin (TOR): balancing the opposing forces of protein synthesis and degradation. *Current Opinion in Genetics & Development*, **9**, 49–54.
- Denu, J.D. (2003) Linking chromatin function with metabolic networks: Sir2 family of NAD1-dependent deacetylases. *Trends in Biochemical Sciences*, **28**, 41–48.
- Deprez, E., Arrebola, R., Conesa, C., and Sentenac, A. (1999) A subunit of yeast TFIIC participates in the recruitment of TATA-binding protein. *Molecular and Cellular Biology*, **19**, 8042–8051.
- Dequard-Chablat, M., Riva, M., Carles, C., and Sentenac, A. (1991) *RPC19*, the gene for a subunit common to yeast RNA polymerases A

- (I) and C (III). *The Journal of Biological Chemistry*, **266**, 15300–15307.
- Dequin, S. and Casaregola, S. (2011) The genomes of fermentative *Saccharomyces*. *Comptes Rendus Biologies*, **334**, 687–693.
- DeRisi, J.L., Iyer, V.R., and Brown, P.O. (1997) Exploring the metabolic and genetic control of gene expression on a genomic scale. *Science*, **278**, 680–686.
- DeRisi, J., van den Hazel, B., Marc, P. et al. (2000) Genome microarray analysis of transcriptional activation in multidrug resistance yeast mutants. *FEBS Letters*, **470**, 156–160.
- Derkatch, I.L., Chernoff, Y.O., Kushnirov, V.V., Inge-Vechtemov, S.G., and Liebman, S.W. (1996) Genesis and variability of [PSI] prion factors in *Saccharomyces cerevisiae*. *Genetics*, **144**, 1375–1386.
- Derkatch, I.L., Bradley, M.E., and Liebman, S.W. (1998) Overexpression of the SUP45 gene encoding a Sup35p-binding protein inhibits the induction of the *de novo* appearance of the [PSI] prion. *Proceedings of the National Academy of Sciences of the United States of America*, **95**, 2400–2405.
- Derkatch, I.L., Bradley, M.E., Hong, J.Y., and Liebman, S.W. (2001) Prions affect the appearance of other prions: the story of [PIN]. *Cell*, **106**, 171–182.
- Derkatch, I.L., Uptain, S.M., Outeiro, T.F., Krishnan, R., Lindquist, S.L., and Liebman, S.W. (2004) Effects of Q/N-rich, polyQ, and non-polyQ amyloids on the *de novo* formation of the [PSI⁺] prion in yeast and aggregation of Sup35 *in vitro*. *Proceedings of the National Academy of Sciences of the United States of America*, **101**, 12934–12939.
- Dershowitz, A. and Newlon, C.S. (1993) The effect on chromosome stability of deleting replication origins. *Molecular and Cellular Biology*, **13**, 391–398.
- Desautels, M. and Goldberg, A.L. (1982) Demonstration of an ATP-dependent, vanadate-sensitive endoprotease in the matrix of rat liver mitochondria. *The Journal of Biological Chemistry*, **257**, 11673–11679.
- Deshaies, R.J. and Schekman, R. (1989) SEC62 encodes a putative membrane protein required for protein translocation into the yeast endoplasmic reticulum. *The Journal of Cell Biology*, **109**, 2653–2664.
- Deshaies, R.J. and Schekman, R. (1990) Structural and functional dissection of Sec62p, a membrane-bound component of the yeast endoplasmic reticulum protein import machinery. *Molecular and Cellular Biology*, **10**, 6024–6035.
- Deshaies, R.J., Sanders, S.L., Feldheim, D.A., and Schekman, R. (1991) Assembly of yeast Sec proteins involved in translocation into the endoplasmic reticulum into a membrane-bound multisubunit complex. *Nature*, **349**, 806–808.
- Deshpande, A.M. and Newlon, C.S. (1992) The ARS consensus sequence is required for chromosomal origin function in *Saccharomyces cerevisiae*. *Molecular and Cellular Biology*, **12**, 4305–4313.
- Desiere, F., Deutsch, E.W., King, N.L. et al. (2006) The PeptideAtlas project. *Nucleic Acids Research*, **34** (Database Issue), D655–D658.
- DeSouza, C.P. and Osmani, S.A. (2009) Double duty for nuclear proteins – the price of more open forms of mitosis. *Trends in Genetics*, **25**, 545–554.
- Despons, L., Wirth, B., Leh-Louis, V., Potier, S., and Souciet, J.-L. (2006) An evolutionary scenario for one of the largest yeast gene families. *Trends in Genetics*, **22**, 10–15.
- Despons, L., Baret, P.V., Frangeul, L., Louis, V. L., Durrens, P., and Souciet, J.L. (2010) Genome-wide computational prediction of tandem gene arrays, application in yeasts. *BMC Genomics*, **11**, 56.
- Despons, L., Uzunov, Z., and Leh-Louis, V. (2011) Tandem gene arrays, plastic chromosomal organisations. *Comptes Rendus Biologies*, **334**, 639–646.
- Deutscher, M.P. (1975) Synthesis of the tRNA CCA-end. *Brookhaven Symposium*, **26**, 124.
- Devault, A., Vallen, E.A., Yuan, T., Green, S., Bensimon, A., and Schwob, E. (2002) Identification of Tah11/Sid2 as the ortholog of the replication licensing factor Cdt1 in *Saccharomyces cerevisiae*. *Current Biology*, **12**, 689–694.
- Devaux, F., Marc, P., and Jacq, C. (2001) Transcriptomes, transcription activators and microarrays. *FEBS Letters*, **498**, 140–144.
- Devine, S.E. and Boeke, J.D. (1996) Integration of the yeast retrotransposon Ty1 is targeted to regions upstream of genes transcribed by RNA polymerase III. *Genes and Development*, **10**, 620–633.
- Dewar, H., Tanaka, K., Nasmyth, K., and Tanaka, T.U. (2004) Tension between two kinetochores suffices for their bi-orientation on the mitotic spindle. *Nature*, **428**, 93–97.
- DeWulf, P., McAinsh, A.D., and Sorger, P.K. (2003) Hierarchical assembly of the budding yeast kinetochore from multiple subcomplexes. *Genes and Development*, **17**, 2902–2921.
- Dezelee, S., Sentenac, A., and Fromageot, P. (1974) Role of deoxyribonucleic acid–ribonucleic acid hybrids in eukaryotes. Synthetic ribo- and deoxyribopolynucleotides as template for yeast ribonucleic acid polymerase B (or II). *The Journal of Biological Chemistry*, **249**, 5978–5983.
- Dheur, S., Vole, T.A., Voisin-Hakil, F. et al. (2003) Pti1p and Ref2p found in association with the mRNA 3' end formation complex direct snoRNA maturation. *The EMBO Journal*, **22**, 2831–2840.
- D'Hondt, K., Heese-Peck, A., and Riezman, H. (2000) Protein and lipid requirements for endocytosis. *Annual Review of Genetics*, **34**, 255–295 (review).
- Dickinson, J.R. and Schweitzer, M. (eds) (2004) *The Metabolism and Molecular Physiology of Saccharomyces cerevisiae*, CRC Press, New York.
- Dickson, R.C. and Markin, J.S. (1978) Molecular cloning and expression in *E. coli* of a yeast gene coding for beta-galactosidase. *Cell*, **15**, 123–130.
- Dieci, G. and Sentenac, A. (1996) Facilitated recycling pathway for RNA polymerase III. *Cell*, **84**, 245–252.
- Dieci, G., Giuliodori, S., Catellani, M., Percudani, R., and Ottonello, S. (2002) Intragenic promoter adaptation and facilitated RNA polymerase III recycling in the transcription of *SCR1*, the 7SL RNA gene of *Saccharomyces cerevisiae*. *The Journal of Biological Chemistry*, **277**, 6903–6914.
- Dieckmann, C.L. and Tzagoloff, A. (1983) Analysis of yeast mitochondrial genes. *Methods in Enzymology*, **97**, 361–373.
- Dietrich, F.S., Voegeli, S., Brachat, S. et al. (2004) The *Ashbya gossypii* genome as a tool for mapping the ancient *Saccharomyces cerevisiae* genome. *Science*, **304**, 304–307.
- Diffels, J.F., Seret, M.L., Goffeau, A., and Baret, P.V. (2006) Heavy metal transporters in Hemiascomycete yeasts. *Biochimie*, **88**, 1639–1649.
- Diffley, J.F. and Cocker, J.H. (1992) Protein–DNA interactions at a yeast replication origin. *Nature*, **357**, 169–172.
- Diffley, J.F. and Stillman, B. (1988) Purification of a yeast protein that binds to origins of DNA replication and a transcriptional silencer. *Proceedings of the National Academy of Sciences of the United States of America*, **85**, 2120–2124.
- Diffley, J.F. and Stillman, B. (1989) Similarity between the transcriptional silencer binding proteins ABF1 and RAP1. *Science*, **246**, 1034–1038.
- Dihanich, M.E., Najarian, D., Clark, R., Gillman, E.C., Martin, N.C., and Hopper, A.K. (1987) Isolation and characterization of *MOD5*, a gene required for isopentenylation of cytoplasmic and mitochondrial tRNAs of *Saccharomyces cerevisiae*. *Molecular and Cellular Biology*, **7**, 177–184.
- Dikicioglu, D., Karabekmez, E., Rash, B., Pir, P., Kirdar, B., and Oliver, S.G. (2011) How yeast re-programmes its transcriptional profile in response to different nutrient impulses. *BMC Systems Biology*, **5**, 148.
- Dilova, I., Aronova, S., Chen, J.C., and Powers, T. (2004) Tor signaling and nutrient-based signals converge on Mks1p phosphorylation to regulate expression of Rtg1/Rtg3p-dependent target genes. *The Journal of Biological Chemistry*, **279**, 46527–46535.
- DiMauro, S. (2004) Mitochondrial diseases. *Biochimica et Biophysica Acta*, **1658**, 80–88.
- Din, S., Brill, S.J., Fairman, M.P., and Stillman, B. (1990) Cell-cycle-regulated phosphorylation of DNA replication factor A from human and yeast cells. *Genes and Development*, **4**, 968–977.
- Diogo, D., Bouchier, C., d'Enfert, C., and Bounoux, M.-E. (2009) Loss of heterozygosity in commensal isolates of the asexual diploid yeast *Candida albicans*. *Fungal Genetics and Biology*, **46**, 159–168.
- Dirheimer, G. and Martin, R. (1990) Mitochondrial tRNAs: structure, modified nucleosides and codon reading patterns, in *Chromatography and Modification of Nucleosides* (eds C.W. Gehrke and K.T.C. Kuo), Elsevier, Amsterdam, pp. B197–B264.
- Dirheimer, G. (2005) Wearing two hats, in *Selected Topics in the History of Biochemistry – Personal Recollections*, IX, vol. 44, **Comprehensive Biochemistry** (eds G. Semenza and A.J. Turner), Elsevier, Amsterdam, pp. 165–265.
- Dirick, L., Bohm, T., and Nasmyth, K. (1995) Roles and regulation of Cln–Cdc28 kinases at the start of the cell cycle of *Saccharomyces cerevisiae*. *The EMBO Journal*, **14**, 4803–4813.
- Distel, B., van der Leij, I., and Kos, W. (1996) Peroxisome isolation. *Methods in Molecular Biology (Clifton, NJ)*, **53**, 133–138.
- D'Mello, N.P., Childress, A.M., Franklin, D.S., Kale, S.P., Pinswasdi, C., and Jazwinski, S.M.

- (1994) Cloning and characterization of *LAG1*, a longevity-assurance gene in yeast. *The Journal of Biological Chemistry*, **269**, 15451–15459.
- Dobson, M.J., Mellor, J., Fulton, A.M. *et al.* (1984) The identification and high level expression of a protein encoded by the yeast *Ty* element. *The EMBO Journal*, **3**, 1115–1119.
- Doering, T.L. and Schekman, R. (1996) GPI anchor attachment is required for Gas1p transport from the endoplasmic reticulum in COP II vesicles. *The EMBO Journal*, **15**, 182–191.
- Dohlman, H.G. and Thorner, J. (1997) RGS proteins and signaling by heterotrimeric G proteins. *The Journal of Biological Chemistry*, **272**, 3871–3874.
- Dohlman, H.G., Song, J., Ma, D., Courchesne, W. E., and Thorner, J. (1996) Sst2, a negative regulator of pheromone signaling in the yeast *Saccharomyces cerevisiae*: expression, localization, and genetic interaction and physical association with Gpa1 (the G-protein alpha subunit). *Molecular and Cellular Biology*, **16**, 5194–5209.
- Dohmen, R.J., Stappen, R., McGrath, J.P. *et al.* (1995) An essential yeast gene encoding a homolog of ubiquitin-activating enzyme. *The Journal of Biological Chemistry*, **270**, 18099–18109.
- Dohrmann, P.R., Butler, B., Tamai, K. *et al.* (1992) Parallel pathways of gene regulation: homologous regulators *SWI5* and *ACE2* differentially control *HO* and chitinase transcription. *Genes and Development*, **6**, 93–104.
- Dolinski, K. and Botstein, D. (2005) Changing perspectives in yeast research nearly a decade after the genome sequence. *Genome Research*, **15**, 1611–1619.
- Dolinski, K. and Botstein, D. (2007) Orthology and functional conservation in eukaryotes. *Annual Review of Genetics*, **41**, 465–507.
- Domdey, H., Apostol, B., Lin, R.J., Newman, A., Brody, E., and Abelson, J. (1984) Lariat structures are *in vivo* intermediates in yeast pre-mRNA splicing. *Cell*, **39**, 611–621.
- Domergue, R., Castano, I., De Las Penas, A. *et al.* (2005) Nicotinic acid limitation regulates silencing of *Candida* adhesions during UTI. *Science*, **308**, 866–870.
- Dong, D., Yuan, Z., and Zhang, Z. (2011) Evidences for increased expression variation of duplicate genes in budding yeast: from *cis*- to *trans*-regulation effects. *Nucleic Acids Research*, **39**, 837–847.
- Dong, H., Nilsson, L., and Kurland, C.G. (1996) Co-variation of tRNA abundance and codon usage in *Escherichia coli* at different growth rates. *Journal of Molecular Biology*, **260**, 649–663.
- Doniger, S.W., Kim, H.S., Swain, D. *et al.* (2008) A catalog of neutral and deleterious polymorphisms in yeast. *PLoS Genetics*, **4**, e10000183.
- Donzeau, M., Kaldi, K., Adam, A. *et al.* (2000) Tim23 links the inner and outer mitochondrial membranes. *Cell*, **101**, 401–412.
- Dougan, D.A., Mogk, A., Zeth, K., Turgay, K., and Bukau, B. (2002) AAA proteins and substrate recognition, it all depends on their partner in crime. *FEBS Letters*, **529**, 6–10.
- Douglas, L.M., Alvarez, F.J., McCreary, C., and Konopka, J.B. (2005) Septin function in yeast model systems and pathogenic fungi. *Eukaryotic Cell*, **4**, 1503–1512 (review).
- Douglas, L.M., Li, L., Yang, Y., and Dranginis, A. M. (2007) Expression and characterization of the flocculin Flo11/Muc1, a *Saccharomyces cerevisiae* mannoprotein with homotypic properties of adhesion. *Eukaryotic Cell*, **6**, 2214–2221.
- Dove, S.L. and Hochschild, A. (2004) A bacterial two-hybrid system based on transcription activation. *Methods in Molecular Biology (Clifton, NJ)*, **261**, 231–246 (review).
- Dowell, S.J., Bishop, A.L., Dyos, S.L., Brown, A.J., and Whiteway, M.S. (1998) Mapping of a yeast G protein betagamma signaling interaction. *Genetics*, **150**, 1407–1417.
- Downs, J.A., Lowndes, N.F. and Jackson, S.P. (2000) A role for *Saccharomyces cerevisiae* histone H2A in DNA repair. *Nature*, **40**, 1001–1004.
- Downs, J.A., Allard, S., Jobin-Robitaille, O. *et al.* (2004) Binding of chromatin-modifying activities to phosphorylated histone H2A at DNA damage sites. *Molecular Cell*, **16**, 979–990.
- Doyon, Y. and Cote, J. (2004) The highly conserved and multifunctional NuA4 HAT complex. *Current Opinion in Genetics & Development*, **14**, 147–154 (review).
- Doyon, Y., Selleck, W., Lane, W.S., Tan, S., and Côté, J. (2004) Structural and functional conservation of the NuA4 histone acetyltransferase complex from yeast to humans. *Molecular and Cellular Biology*, **24**, 1884–1896.
- Dragon, F., Gallagher, J.E., Compagnone-Post, P.A. *et al.* (2002) A large nucleolar U3 ribonucleoprotein required for 18S ribosomal RNA biogenesis. *Nature*, **417**, 967–970.
- Dragosits, M., Stadlmann, J., Graf, A. *et al.* (2010) The response to unfolded protein is involved in osmotolerance of *Pichia pastoris*. *BMC Genomics*, **11**, 207.
- Drillon, G. and Fischer, G. (2011) Comparative study on synteny between yeasts and vertebrates. *Comptes Rendus Biologies*, **334**, 629–638.
- Drimmenberg, I.A., Weinberg, D.E., Xie, K.T. *et al.* (2009) RNAi in budding yeast. *Science*, **326**, 544–550.
- Driscoll, R., Hudson, A., and Jackson, S.P. (2007) Yeast Rtt109 promotes genome stability by acetylating histone H3 on lysine 56. *Science*, **315**, 649–652.
- Dröse, S., Krack, S., Sokolova, L. *et al.* (2011) Functional dissection of the proton pumping modules of mitochondrial complex I. *PLoS Biology*, **9**, e1001128.
- Drubin, D.G., Miller, K.G., and Botstein, D. (1988) Yeast actin-binding proteins: evidence for a role in morphogenesis. *The Journal of Cell Biology*, **107**, 2551–2561.
- Drubin, D.A., Way, J.C., and Silver, P.A. (2007) Designing biological systems. *Genes and Development*, **21**, 242–254.
- D'Souza-Schorey, C. and Chavrier, P. (2006) ARF proteins: roles in membrane traffic and beyond. *Nature Reviews Molecular Cell Biology*, **7**, 347–358.
- Du, Y.C. and Stillman, B. (2002) Yph1p, an ORC-interacting protein: potential links between cell proliferation control, DNA replication, and ribosome biogenesis. *Cell*, **109**, 835–848.
- Du, J., Nasir, I., Benton, B.K., Kladde, M.P., and Laurent, B.C. (1998) Sth1p, a *Saccharomyces cerevisiae* Snf2p/Swi2p homolog, is an essential ATPase in RSC and differs from Snf/Swi in its interactions with histones and chromatin-associated proteins. *Genetics*, **150**, 987–1005.
- Du, Z., Park, K.W., Yu, H., Fan, Q., and Li, L. (2008) Newly identified prion linked to the chromatin-remodeling factor Swi1 in *Saccharomyces cerevisiae*. *Nature Genetics*, **40**, 460–465.
- Dubaquie, Y., Looser, R., and Rospert, S. (1997) Significance of chaperonin 10-mediated inhibition of ATP hydrolysis by chaperonin 60. *Proceedings of the National Academy of Sciences of the United States of America*, **94**, 9011–9016.
- Dubiel, W., Ferrell, K., Pratt, G., and Rechsteiner, M. (1992) Subunit 4 of the 26S protease is a member of a novel eukaryotic ATPase family. *The Journal of Biological Chemistry*, **267**, 22699–22702.
- Dubiel, W., Ferrell, K., and Rechsteiner, M. (1995a) Subunits of the regulatory complex of the 26S protease. *Molecular Biology Reports*, **21**, 27–34 (review).
- Dubiel, W., Ferrell, K., Dumdey, R., Standera, S., Prehn, S., and Rechsteiner, M. (1995b) Molecular cloning and expression of subunit 12: a non-MCP and non-ATPase subunit of the 26S protease. *FEBS Letters*, **363**, 97–100.
- Dubois, E. and Messenguy, F. (1991) *In vitro* studies of the binding of the ARGR proteins to the ARG5 6 promoter. *Molecular and Cellular Biology*, **11**, 2162–2168.
- Dubois, E. and Messenguy, F. (1997) Integration of the multiple controls regulating the expression of the arginase gene *CAR1* of *Saccharomyces cerevisiae* in response to different nitrogen signals: role of Gln3p, ArgRp-Mcm1p and Ume6p. *Molecular & General Genetics*, **253**, 568–580.
- Dubois, E., Dewaste, V., Erneux, C., and Messenguy, F. (2000) Inositol polyphosphate kinase activity of Arg82/ArgRIII is not required for the regulation of the arginine metabolism in yeast. *FEBS Letters*, **486**, 300–304.
- Dubouloz, F., Deloche, O., Wanke, V., Camerini, E., and De Virgilio, C. (2005) The TOR and EGO protein complexes orchestrate microautophagy in yeast. *Molecular Cell*, **19**, 15–26.
- Dubrana, K., Perrod, S., and Gasser, S.M. (2001) Turning telomeres off and on. *Current Opinion in Cell Biology*, **13**, 281–289.
- Dubrovsky, E.B., Dubrovskaya, V.A., Levinger, L., Schiffer, S., and Marchfelder, A. (2004) *Drosophila* RNase Z processes mitochondrial and nuclear pre-tRNA 3' ends *in vivo*. *Nucleic Acids Research*, **32**, 255–262.
- Duda, D.M., Scott, D.C., Calabrese, M.F., Zimmerman, E.S., Zheng, N., and Schulman, B.A. (2011) Structural regulation of cullin-RING ubiquitin ligase complexes. *Current Opinion in Structural Biology*, **21**, 257–264.
- Duden, R., Hosobuchi, M., Hamamoto, S., Winey, M., Byers, B., and Schekman, R. (1994) Yeast beta- and beta'-coat proteins (COP). Two coatomer subunits essential for endoplasmic reticulum-to-Golgi protein traffic. *The Journal of Biological Chemistry*, **269**, 24486–24495.
- Duennwald, M.L., Jagadish, S., Muchowski, P.J., and Lindquist, S. (2006) Flanking sequences

- profoundly alter polyglutamine toxicity in yeast. *Proceedings of the National Academy of Sciences of the United States of America*, **103**, 11045–11050.
- Duex, J.E., Tang, F., and Weisman, L.S. (2006) The Vac14p–Fig4p complex acts independently of Vac7p and couples PI3,5P₂ synthesis and turnover. *The Journal of Cell Biology*, **172**, 693–704.
- Dufour, J.P., Boutry, M., and Goffeau, A. (1980) Plasma membrane ATPase of yeast. Comparative inhibition studies of the purified and membrane-bound enzymes. *The Journal of Biological Chemistry*, **255**, 5735–5741.
- Dujon, B., Slonimski, P.P., and Weill, L. (1974) Mitochondrial genetics. IX. A model for recombination and segregation of mitochondrial genomes in *S. cerevisiae*. *Genetics*, **78**, 415–437.
- Dujon, B., Colleaux, L., Jacquier, A., Michel, F., and Monteilhet, C. (1986) Mitochondrial introns as mobile genetic elements: the role of intron-encoded proteins, in *Extrachromosomal Elements in Lower Eukaryotes* (ed. R. Wickner), Plenum, New York, pp. 5–27.
- Dujon, B., Alexandraki, D., Andre, B. *et al.* (1994) Complete nucleotide sequence of yeast chromosome XI. *Nature*, **369**, 371–378.
- Dujon, B., Sherman, D., Fischer, G. *et al.* (2004) Genome evolution in yeasts. *Nature*, **430**, 35–44.
- Dujon, B. (1979) Mutants in a mosaic gene reveal functions for introns. *Nature*, **282**, 777–778.
- Dujon, B. (1980) Sequence of the intron and flanking exons of the mitochondrial 21S rRNA gene of yeast strains having different alleles at the ω and RIB1 loci. *Cell*, **20**, 185–297.
- Dujon, B. (2003) Comparative genomics of Hemiascomycetous yeasts, the systematic sequencing of *Candida glabrata*, *Kluyveromyces lactis*, *Debaryomyces hansenii*, *Yarrowia lipolytica*. *Yeast (Chichester, England)*, **20**, S15–S15.
- Dujon, B. (2005) Homing endonucleases and the yeast mitochondrial *omega* locus – a historical perspective, in *Homing Endonucleases and Inteins* (eds M.L. Belfort, B. L. Stoddard, D.W. Wood, and V. Derbyshire), Springer, Berlin, pp. 11–31.
- Dujon, B. (2006) Yeasts illustrate the molecular mechanisms of eukaryotic genome evolution. *Trends in Genetics*, **22**, 375–387 (review).
- Dujon, B. (2009) Evolutionary genomics of yeasts, in *Evolutionary Genomics and Systems Biology* (ed. G. Caetano-Anolles), Wiley-Blackwell, Hoboken, NJ, pp. 95–122.
- Dujon, B. (2010) Yeast evolutionary genomics. *Nature Reviews Genetics*, **11**, 512–524.
- Dumas, B., Brocard-Masson, C., Assemat-Lebrun, K., and Achstetter, T. (2006) Hydrocortisone made in yeast: metabolic engineering turns a unicellular microorganism into a drug-synthesizing factory. *Journal of Biotechnology*, **1**, 299–307.
- Dumay-Odelot, H., Acker, J., Arrebola, R., Sentenac, A., and Marck, C. (2002) Multiple roles of the tau131 subunit of yeast transcription factor IIIC (TFIIIC) in TFIIB assembly. *Molecular and Cellular Biology*, **22**, 298–308.
- Dunn, R. and Hicke, L. (2001) Domains of the Rsp5 ubiquitin–protein ligase required for receptor-mediated and fluid-phase endocytosis. *Molecular Biology of the Cell*, **12**, 421–435.
- Dunn, B. and Sherlock, G. (2008) Reconstruction of the genome origins and evolution of the hybrid lager yeast *Saccharomyces pastorianus*. *Genome Research*, **18**, 1610–1623.
- Dunn, R., Klos, D.A., Adler, A.S., and Hicke, L. (2004) The C2 domain of the Rsp5 ubiquitin ligase binds membrane phosphoinositides and directs ubiquitination of endosomal cargo. *The Journal of Cell Biology*, **165**, 135–144.
- Dunn, W.A.Jr, Cregg, J.M., Kiel, J.A. *et al.* (2005) Pexophagy, the selective autophagy of peroxisomes. *Autophagy*, **1**, 75–83.
- Duntze, W., MacKay, V., and Manney, T. (1970) *Saccharomyces cerevisiae*: a diffusible sex factor. *Science*, **168**, 1472–1473.
- Dupré, S., Urban-Grimal, D., and Haguenaer-Tsapis, R. (2004) Ubiquitin and endocytic internalization in yeast and animal cells. *Biochimica et Biophysica Acta*, **1695**, 89–111 (review).
- Duro, E., Vaisica, J.A., Brown, G.W., and Rouse, J. (2008) Budding yeast Mms22 and Mms1 regulate homologous recombination induced by replisome blockage. *DNA Repair*, **7**, 811–818.
- Durrens, P., Nikolski, M., and Sherman, D. (2008) Fusion and fission of genes define a metric between fungal genomes. *PLoS Computational Biology*, **4**, e1000200.
- Duvel, K., Santhanam, A., Garrett, S., Schnepfer, L., and Broach, J.R. (2003) Multiple roles of Tap42 in mediating rapamycin-induced transcriptional changes in yeast. *Molecular Cell*, **11**, 1467–1478.
- Duvezin-Caubet, S., Jagasia, R., Wagener, J. *et al.* (2006) Proteolytic processing of OPA1 links mitochondrial dysfunction to alterations in mitochondrial morphology. *The Journal of Biological Chemistry*, **281**, 37972–37979.
- Dymond, J.S., Richardson, S.M., Coombes, C.E. *et al.* (2011) Synthetic chromosome arms function in yeast and generate phenotypic diversity by design. *Nature*, **477**, 471–476.
- Eaglestone, S.S., Cox, B.S., and Tuite, M.F. (1999) Translation termination efficiency can be regulated in *Saccharomyces cerevisiae* by environmental stress through a prion-mediated mechanism. *The EMBO Journal*, **18**, 1974–1981.
- Ebbert, R., Birkmann, A., and Schüller, H.J. (1999) The product of the SNF2/SWI2 paralogue INO80 of *Saccharomyces cerevisiae* required for efficient expression of various yeast structural genes is part of a high-molecular-weight protein complex. *Molecular Microbiology*, **32**, 741–751.
- Ebel, J.-P., Giège, R., Bonnet, J. *et al.* (1973) Factors determining the specificity of the tRNA aminoacylation reaction. Non-absolute specificity of tRNA-aminoacyl-tRNA synthetase recognition and particular importance of the maximal velocity. *Biochimie*, **55**, 547–557.
- Ebner, E., Mennucci, L., and Schatz, G. (1973) Mitochondrial assembly in respiration-deficient mutants of *Saccharomyces cerevisiae*. I. Effect of nuclear mutations on mitochondrial protein synthesis. *The Journal of Biological Chemistry*, **248**, 5360–5368.
- Eckert, J.H. and Erdmann, R. (2003) Peroxisome biogenesis. *Reviews of Physiology, Biochemistry and Pharmacology*, **147**, 75–121.
- Edmonds, M. and Caramela, M.G. (1969) The isolation and characterization of adenosine monophosphate-rich polynucleotides synthesized by Ehrlich ascites cells. *The Journal of Biological Chemistry*, **244**, 1314–1324.
- Edmonds, M., Vaughan, M.H., and Nakazato, H. (1971) Polyadenylic acid sequences in the heterogeneous nuclear RNA and rapidly-labeled polyribosomal RNA of HeLa cells: possible evidence for a precursor relationship. *Proceedings of the National Academy of Sciences of the United States of America*, **68**, 1336–1340.
- Edmondson, D.G., Smith, M.M., and Roth, S.Y. (1996) Repression domain of the yeast global repressor TUP1 interacts directly with histones H3 and H4. *Genes and Development*, **10**, 1247–1259.
- Edqvist, J., Grosjean, H., and Straby, K.B. (1992) Identity elements for N2-dimethylation of guanosine-26 in yeast tRNAs. *Nucleic Acids Research*, **20**, 6575–6581.
- Edwards, A.M., Darst, S.A., Feaver, W.J., Thompson, N.E., Burgess, R.R., and Kornberg, R.D. (1990) Purification and lipid-layer crystallization of yeast RNA polymerase II. *Proceedings of the National Academy of Sciences of the United States of America*, **87**, 2122–2126.
- Egel, R. (2005) Fission yeast mating-type switching: programmed damage and repair. *DNA Repair*, **4**, 525–536.
- Egner, R., Mahe, Y., Pandjaitan, R., and Kuchler, K. (1995) Endocytosis and vacuolar degradation of the plasma membrane-localized Pdr5 ATP-binding cassette multidrug transporter in *Saccharomyces cerevisiae*. *Molecular and Cellular Biology*, **15**, 5879–5887.
- Ehrenhofer-Murray, A.E., Rivier, D.H. and Rine, J. (1997) The role of Sas2, an acetyltransferase homologue of *Saccharomyces cerevisiae*, in silencing and ORC function. *Genetics*, **145**, 923–934.
- Ehrenhofer-Murray, A.E. (2004) Chromatin dynamics at DNA replication, transcription and repair. *European Journal of Biochemistry*, **271**, 2335–2349.
- Ehrhard, K.N., Jacoby, J.J., Fu, X.Y., Jahn, R., and Dohlman, H.G. (2000) Use of G-protein fusions to monitor integral membrane protein–protein interactions in yeast. *Nature Biotechnology*, **18**, 1075–1079.
- Eichinger, C.S. and Jentsch, S. (2010) Synaptonemal complex formation and meiotic checkpoint signaling are linked to the lateral element protein Red1. *Proceedings of the National Academy of Sciences of the United States of America*, **107**, 11370–11375.
- Eigel, A. and Feldmann, H. (1982) Ty1 and delta elements occur adjacent to several tRNA genes in yeast. *The EMBO Journal*, **1**, 1245–1250.
- Eilers, M., Opplinger, W., and Schatz, G. (1987) Both ATP and an energized inner membrane are required to import a purified precursor protein into mitochondria. *The EMBO Journal*, **6**, 1073–1077.

- Eilers, M., Verner, K., Hwang, S., and Schatz, G. (1988) Import of proteins into mitochondria. *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences*, **319**, 121–126.
- Eisenberg, T., Buttner, S., Kroemer, G., and Madeo, F. (2007) The mitochondrial pathway in yeast apoptosis. *Apoptosis*, **12**, 1011–1023.
- Eisenhaber, B., Maurer-Stroh, S., Novatchkova, M., Schneider, G. and Eisenhaber, F. (2003) Enzymes and auxiliary factors for GPI lipid anchor biosynthesis and post-translational transfer to proteins. *Bioessays*, **25**, 367–385.
- Eisenmann, D.M., Dollard, C., and Winston, F. (1989) *SPT15*, the gene encoding the yeast TATA binding factor TFIID, is required for normal transcription initiation *in vivo*. *Cell*, **58**, 1183–1191.
- Elati, M., Neuvial, P., Bolotin-Fukuhara, M., Barillot, E., Radvanyi, F., and Rouveiro, C. (2007) LICORN: learning co-operative regulation networks from gene expression data. *Bioinformatics (Oxford, England)*, **23**, 2407–2414.
- Elbein, A.D., Pan, Y.T., Pastuszak, I., and Carroll, D. (2003) New insights on trehalose: a multifunctional molecule. *Glycobiology*, **13**, 17R–27R (review).
- Elgersma, Y., van den Berg, M., Tabak, H.F., and Distel, B. (1993) An efficient positive selection procedure for the isolation of peroxisomal import and peroxisome assembly mutants of *Saccharomyces cerevisiae*. *Genetics*, **135**, 731–740.
- Elgersma, Y., Kwast, L., Klein, A. *et al.* (1996) The SH3 domain of the *Saccharomyces cerevisiae* peroxisomal membrane protein Pex13p functions as a docking site for Pex5p, a mobile receptor for the import of PTS1 containing proteins. *The Journal of Cell Biology*, **135**, 97–109.
- Elion, E.A. and Warner, J.R. (1984) The major promoter element of rRNA transcription in yeast lies 2kb upstream. *Cell*, **39**, 663–673.
- Ellenberger, T.E., Brandl, C.J., Struhl, K., and Harrison, S.C. (1992) The GCN4 basic region leucine zipper binds DNA as a dimer of uninterrupted alpha helices: crystal structure of the protein–DNA complex. *Cell*, **71**, 1223–1237.
- Ellis, S.R., Hopper, A.K., and Martin, N.C. (1987) Amino-terminal extension generated from an upstream AUG codon is not required for mitochondrial import of yeast N2, N2-dimethylguanosine-specific tRNA methyltransferase. *Proceedings of the National Academy of Sciences of the United States of America*, **84**, 5172–5176.
- Ellisdon, A.M., Jani, D., Köhler, A., Hurt, E., and Stewart, M. (2010) Structural basis for the interaction between yeast Spt-Ada-Gcn5 acetyltransferase (SAGA) complex components Sgf11 and Sus1. *The Journal of Biological Chemistry*, **285**, 3850–3856.
- Ellison, V. and Stillman, B. (2003) Biochemical characterization of DNA damage checkpoint complexes: clamp loader and clamp complexes with specificity for 5' recessed DNA. *PLoS Biology*, **1**, E33.
- Elowitz, M.B., Levine, A.J., Siggia, E.D., and Swain, P.S. (2002) Stochastic gene expression in a single cell. *Science*, **297**, 1183–1186.
- Elsasser, S. and Finley, D. (2005) Delivery of ubiquitinated substrates to protein-unfolding machines. *Nature Cell Biology*, **7**, 742–749 (review).
- Elsasser, S., Gali, R.R., Schwickart, M. *et al.* (2002) Proteasome subunit Rpn1 binds ubiquitin-like protein domains. *Nature Cell Biology*, **4**, 725–730.
- Elsasser, S., Chandler-Militello, D., Muller, B., Hanna, J., and Finley, D. (2004) Rad23 and Rpn10 serve as alternative ubiquitin receptors for the proteasome. *The Journal of Biological Chemistry*, **279**, 26817–26822.
- Emadali, A. and Gallagher-Gambarelli, M. (2009) [Quantitative proteomics by SILAC: practicalities and perspectives for an evolving approach]. *Médecine Sciences (Paris)*, **25**, 835–842.
- Emili, A., Schieltz, D.M., Yates, J.R.3rd, and Hartwell, L.H. (2001) Dynamic interaction of DNA damage checkpoint protein Rad53 with chromatin assembly factor Asf1. *Molecular Cell*, **7**, 13–20.
- Emr, S.D., Schekman, R., Flessel, M.C., and Thorner, J. (1983) An MF alpha 1–SUC2 (alpha-factor-invertase) gene fusion for study of protein localization and gene expression in yeast. *Proceedings of the National Academy of Sciences of the United States of America*, **80**, 7080–7084.
- Emr, S., Glick, B.S., Linstedt, A.D. *et al.* (2009) Journeys through the Golgi – taking stock in a new era. *The Journal of Cell Biology*, **187**, 449–453.
- Enemark, E.J. and Joshua-Tor, L. (2008) On helicases and other motor proteins. *Current Opinion in Structural Biology*, **18**, 243–257.
- Englmeier, L., Olivo, J.C., and Mattaj, I.W. (1999) Receptor-mediated substrate translocation through the nuclear pore complex without nucleotide triphosphate hydrolysis. *Current Biology*, **9**, 30–41.
- Enke, D.A., Kaldis, P., Holmes, J.K., and Solomon, M.J. (1999) The CDK-activating kinase (Cak1p) from budding yeast has an unusual ATP-binding pocket. *The Journal of Biological Chemistry*, **274**, 1949–1956.
- Enright, A.J., Iliopoulos, I., Kyripides, N.C., and Ouzounis, C.A. (1999) Protein interaction maps for complete genomes based on gene fusion events. *Nature*, **402**, 86–90.
- Enserink, J.M. and Kolodner, R.D. (2010) An overview of Cdk1-controlled targets and processes. *Cell Division*, **5**, 11–53.
- Entian, K.D., Schuster, T., Hegemann, J.H. *et al.* (1999) Functional analysis of 150 deletion mutants in *Saccharomyces cerevisiae* by a systematic approach. *Molecular & General Genetics*, **262**, 683–702.
- Ephrussi, B. and Slonimski, P.P. (1955) Subcellular units involved in the synthesis of respiratory enzymes in yeast. *Nature*, **176**, 1207–1208.
- Ephrussi, B., Hottinguer, H., and Chimenes, H. (1949) Action de l'acriflavin sur les levures: I. La mutation "petite" colonie. *Annales de l'Institut Pasteur*, **76**, 351–368.
- Epp, J.A. and Chant, J. (1997) An IQGAP-related protein controls actin-ring formation and cytokinesis in yeast. *Current Biology*, **7**, 921–929.
- Erdman, S. and Snyder, M. (2001) A filamentous growth response mediated by the yeast mating pathway. *Genetics*, **159**, 919–928.
- Erdmann, R. and Blobel, G. (1996) Identification of Pex13p, a peroxisomal membrane receptor for the PTS1 recognition factor. *The Journal of Cell Biology*, **135**, 111–121.
- Erdmann, R., Veenhuis, M., Mertens, D., and Kunau, W.H. (1989) Isolation of peroxisome-deficient mutants of *Saccharomyces cerevisiae*. *Proceedings of the National Academy of Sciences of the United States of America*, **86**, 5419–5423.
- Erdmann, R., Wiebel, F.F., Flessau, A. *et al.* (1991) PAS1, a yeast gene required for peroxisome biogenesis, encodes a member of a novel family of putative ATPases. *Cell*, **64**, 499–510.
- Eriani, G., Delarue, M., Poch, O., Gangloff, J., and Moras, D. (1990) Partition of tRNA synthetases into two classes based on mutually exclusive sets of sequence motifs. *Nature*, **347**, 203–206.
- Eriani, G., Cavarelli, J., Martin, F. *et al.* (1995) The class II aminoacyl-tRNA synthetases and their active site: evolutionary conservation of an ATP binding site. *Journal of Molecular Evolution*, **40**, 499–508.
- Erkina, T.Y., Zou, Y., Freeling, S., Vorobyev, V.I., and Erkin, A.M. (2010) Functional interplay between chromatin remodeling complexes RSC, SWI/SNF and ISWI in regulation of yeast heat shock genes. *Nucleic Acids Research*, **38**, 1441–1449.
- Erkmanna, J.A. and Kutay, U. (2004) Nuclear export of mRNA: from the site of transcription to the cytoplasm. *Experimental Cell Research*, **296**, 12–20 (review).
- Ertel, F., Dirac-Svejstrup, A.B., Hertel, C.B., Blaschke, D., Svejstrup, J.Q., Korber, P. (2010) In vitro reconstitution of PHO5 promoter chromatin remodeling points to a role for activator-nucleosome competition *in vivo*. *Molecular and Cellular Biology*, **30**, 4060–4076.
- Escusa, S., Camblong, J., Galan, J.M., Pinson, B., and Daignan-Fornier, B. (2006) Proteasome- and SCF-dependent degradation of yeast adenine deaminase upon transition from proliferation to quiescence requires a new F-box protein named Saf1p. *Molecular Microbiology*, **60**, 1014–1025.
- Eshel, D., Urrestarazu, L.A., Vissers, S. *et al.* (1993) Cytoplasmic dynein is required for normal nuclear segregation in yeast. *Proceedings of the National Academy of Sciences of the United States of America*, **90**, 11172–11176.
- Esmon, B., Novick, P., and Schekman, R. (1981) Compartmentalized assembly of oligosaccharides on exported glycoproteins in yeast. *Cell*, **25**, 451–460.
- Esmon, B., Esmon, P.C., and Schekman, R. (1984) Early steps in processing of yeast glycoproteins. *The Journal of Biological Chemistry*, **259**, 10322–10327.
- Esnault, Y., Feldheim, D., Blondel, M.O., Schekman, R., and Kepes, F. (1994) SSS1 encodes a stabilizing component of the Sec61 subcomplex of the yeast protein translocation apparatus. *The Journal of Biological Chemistry*, **269**, 27478–27485.
- Esser, K., Tursun, B., Ingenhoven, M., Michaelis, G., and Pratz, E. (2002) A novel two-step mechanism for removal of a mitochondrial signal sequence involves the mAAA complex and the putative rhomboid protease Pcp1. *Journal of Molecular Biology*, **323**, 835–843.

- Estes, H.G., Robinson, B.S., and Eisenberg, S. (1992) At least three distinct proteins are necessary for the reconstitution of a specific multiprotein complex at a eukaryotic chromosomal origin of replication. *Proceedings of the National Academy of Sciences of the United States of America*, **89**, 11156–11160.
- Estruch, F., Hodge, C.A., Rodríguez-Navarro, S., and Cole, C.N. (2005) Physical and genetic interactions link the yeast protein Zds1p with mRNA nuclear export. *The Journal of Biological Chemistry*, **280**, 9691–9697.
- Evangelista, M., Pruyne, D., Amberg, D.C., Boone, C., and Bretschger, A. (2002) Formins direct Arp2/3-independent actin filament assembly to polarize cell growth in yeast. *Nature Cell Biology*, **4**, 260–269.
- Evans, T., Hunt, T., and Youngblom, J. (1982) On the role of maternal mRNA in sea urchins: studies of a protein which appears to be destroyed at a particular point in each cell division cycle. *The Biological Bulletin*, **163**, 372.
- Evans, T., Rosenthal, E.T., Youngblom, J., Distel, D., and Hunt, T. (1983) Cyclin: a protein specified by maternal mRNA in sea urchin eggs that is destroyed at each cleavage division. *Cell*, **33**, 389–396.
- Evrin, C., Clarke, P., Zech, J. *et al.* (2009) A double-hexameric MCM2–7 complex is loaded onto origin DNA during licensing of eukaryotic DNA replication. *Proceedings of the National Academy of Sciences of the United States of America*, **106**, 20240–20245.
- Eytan, G.D. and Schatz, G. (1975) Cytochrome *c* oxidase from bakers' yeast. V. Arrangement of the subunits in the isolated and membrane-bound enzyme. *The Journal of Biological Chemistry*, **250**, 767–774.
- Fabre, E., Dujon, B., and Richard, G.F. (2002a) Transcription and nuclear transport of CAG/CTG trinucleotide repeats in yeast. *Nucleic Acids Research*, **30**, 3540–3547.
- Fabre, F., Chan, A., Heyer, W.D., and Gangloff, S. (2002b) Alternate pathways involving Sgs1/Top3, Mus81/Mms4, and Srs2 prevent formation of toxic recombination intermediates from single-stranded gaps created by DNA replication. *Proceedings of the National Academy of Sciences of the United States of America*, **99**, 16887–16892.
- Fabre, E., Müller, H., Therizols, P. *et al.* (2005) Comparative genomics in hemiascomycete yeasts, evolution of sex, silencing and subtelomeres. *Molecular Biology and Evolution*, **22**, 856–873.
- Fabrizio, P. and Longo, V.D. (2003) The chronological life span of *Saccharomyces cerevisiae*. *Aging Cell*, **2**, 73–81.
- Fadri, M., Daquinag, A., Wang, S., Xue, T., and Kunz, J. (2005) The pleckstrin homology domain proteins Slm1 and Slm2 are required for actin cytoskeleton organization in yeast and bind phosphatidylinositol-4,5-bisphosphate and TORC2. *Molecular Biology of the Cell*, **16**, 1883–1900.
- Fagarasanu, M., Fagarasanu, A., and Rachubinsk, R.A. (2006) Sharing the wealth: peroxisome inheritance in budding yeast. *Biochimica et Biophysica Acta*, **1763**, 1669–1677.
- Fahrner, K., Yarger, J., and Hereford, L. (1980) Yeast histone mRNA is polyadenylated. *Nucleic Acids Research*, **8**, 5725–5737.
- Fairhead, C. and Dujon, B. (2006) Structure of *Kluyveromyces lactis* subtelomeres, duplication and gene content. *FEMS Yeast Research*, **6**, 428–441.
- Fairhead, C., Thierry, A., Denis, F., Eck, M., and Dujon, B. (1998) Mass-murder of ORFs from three regions of chromosome XI from *S. cerevisiae*. *Genetics*, **223**, 33–46.
- Fairman-Williams, M.E., Guenther, U.-P., and Jankowsky, E. (2010) SF1 and SF2 helicases: family matters. *Current Opinion in Structural Biology*, **20**, 313–324.
- Falcone, C., Saliola, M., Chen, X.J., Frontali, L., and Fukuhara, H. (1986) Analysis of a 1.6-micron circular plasmid from the yeast *Kluyveromyces drosophilorum*, structure and molecular dimorphism. *Plasmid*, **15**, 248–252.
- Fang, Y., Fliss, A.E., Rao, J., and Caplan, A.J. (1998) SBA1 encodes a yeast hsp90 cochaperone that is homologous to vertebrate p23 proteins. *Molecular and Cellular Biology*, **18**, 3727–3734.
- Fang, J., Hogan, G.J., Liang, G., Lieb, J.D., and Zhang, Y. (2007) The *Saccharomyces cerevisiae* histone demethylase Jhd1 fine-tunes the distribution of H3K36me2. *Molecular and Cellular Biology*, **27**, 5055–5065.
- Fang, Z.A., Wang, G.H., Chen, A.L. *et al.* (2009) Gene responses to oxygen availability in *Kluyveromyces lactis*, an insight on the evolution of the oxygen-responding system in yeast. *PLoS One*, **4**, e7561.
- Fangman, W.L. and Brewer, B.J. (1991) Activation of replication origins within yeast chromosomes. *Annual Review of Cell Biology*, **7**, 375–402 (review).
- Fangman, W.L. and Dujon, B. (1984) Yeast mitochondrial genomes consisting of only A: T base pairs replicate and exhibit suppressiveness. *Proceedings of the National Academy of Sciences of the United States of America*, **81**, 7156–60.
- Fares, H., Goetsch, L., and Pringle, J.R. (1996) Identification of a developmentally regulated septin and involvement of the septins in spore formation in *Saccharomyces cerevisiae*. *The Journal of Cell Biology*, **132**, 399–411.
- Farkasovsky, M. and Kuntzel, H. (1995) Yeast Num1p associates with the mother cell cortex during S/G₂ phase and affects microtubular functions. *The Journal of Cell Biology*, **131**, 1003–1014.
- Farkasovsky, M. and Kuntzel, H. (2001) Cortical Num1p interacts with the dynein intermediate chain Pac11p and cytoplasmic microtubules in budding yeast. *The Journal of Cell Biology*, **152**, 251–262.
- Farquhar, M.G. and Palade, G.E. (1998) The Golgi apparatus: 100 years of progress and controversy. *Trends in Cell Biology*, **8**, 2–10 (review).
- Fasken, M.B. and Corbett, A.H. (2009) Mechanisms of nuclear mRNA quality control. *RNA Biology*, **6**, 237–241.
- Fasken, M.B., Stewart, M., and Corbett, A.H. (2008) Functional significance of the interaction between the mRNA-binding protein, Nab2, and the nuclear pore-associated protein, Mlp1, in mRNA export. *The Journal of Biological Chemistry*, **283**, 27130–27143.
- Fasolo, J. and Snyder, M. (2009) Protein microarrays. *Methods in Molecular Biology (Clifton, NJ)*, **548**, 209–222.
- Fatica, A. and Tollervey, D. (2002) Making ribosomes. *Current Opinion in Cell Biology*, **14**, 313–318.
- Fatica, A., Oeffinger, M., Tollervey, D., and Bozzoni, I. (2003) Cic1p/Nsa3p is required for synthesis and nuclear export of 60S ribosomal subunits. *RNA*, **9**, 1431–1436.
- Faty, M., Fink, M., and Barral, Y. (2002) Septins: a ring to part mother and daughter. *Current Genetics*, **41**, 123–131.
- Fay J.C. and Benavides J.A. (2005) Evidence for domesticated and wild populations of *Saccharomyces cerevisiae*. *PLoS Genet.* **1**: 66–71.
- Fay, J.C. and Benavides, J.A. (2005) Evidence for domesticated and wild populations of *Saccharomyces cerevisiae*. *PLoS Genetics*, **1**, 66–71.
- Faye, G., Fukuhara, H., Grandchamp, C. *et al.* (1973) Mitochondrial nucleic acids in the petite colonie mutants: deletions and repetitions of genes. *Biochimie*, **55**, 779–792.
- Faye, G., Dennebouy, N., Kujawa, C., and Jacq, C. (1979) Inserted sequence in the mitochondrial 23S ribosomal RNA gene of the yeast *Saccharomyces cerevisiae*. *Molecular & General Genetics*, **168**, 101–109.
- Ferandon, C., Moukha, S., Callac, P., Benedetto, J.P., Castroviejo, M., and Barroso, G. (2010) The *Agaricus bisporus* *cox1* gene, the longest mitochondrial gene and the largest reservoir of mitochondrial group I introns. *PLoS One*, **5**, e14048.
- Feaver, W.J., Gileadi, O., and Kornberg, R.D. (1991a) Purification and characterization of yeast RNA polymerase II transcription factor b. *The Journal of Biological Chemistry*, **266**, 19000–19005.
- Feaver, W.J., Gileadi, O., Li, Y., and Kornberg, R. D. (1991b) CTD kinase associated with yeast RNA polymerase II initiation factor b. *Cell*, **67**, 1223–1230.
- Feaver, W.J., Svejstrup, J.Q., Bardwell, L. *et al.* (1993) Dual roles of a multiprotein complex from *S. cerevisiae* in transcription and DNA repair. *Cell*, **75**, 1379–1387.
- Fecycz, I.T. and Blobel, G. (1987) Soluble factors stimulating secretory protein translocation in bacteria and yeast can substitute for each other. *Proceedings of the National Academy of Sciences of the United States of America*, **84**, 3723–3727.
- Fedor-Chaikin, M., Deschenes, R.J., and Broach, J.R. (1990) SRV2, a gene required for RAS activation of adenylate cyclase in yeast. *Cell*, **61**, 329–340.
- Feista, A.M. and Palsson, B.O. (2010) The biomass objective function. *Current Opinion in Microbiology*, **13**, 344–349.
- Feldheim, D. and Schekman, R. (1994) Sec72p contributes to the selective recognition of signal peptides by the secretory polypeptide translocation complex. *The Journal of Cell Biology*, **126**, 935–943.
- Feldman, R.M., Correll, C.C., Kaplan, K.B., and Deshaies, R.J. (1997) A complex of Cdc4p, Skp1p, and Cdc53p/cullin catalyzes ubiquitination of the phosphorylated CDK inhibitor Sic1p. *Cell*, **91**, 221–230.
- Feldmann, H. and Zachau, H.G. (1964) Chemical evidence for the 3' linkage of amino acids to sRNA. *Biochemical and Biophysical Research Communications*, **15**, 13–17.
- Feldmann, H., Aigle, M., Aijinovic, G. *et al.* (1994) Complete DNA sequence of yeast

- chromosome II. *The EMBO Journal*, **13**, 5795–5809.
- Feldmann, H. (1977) A comparison of transcriptional linkage of tRNA cistrons in yeast and *E. coli* by the ultraviolet light technique. *Nucleic Acids Research*, **4**, 2831–2841.
- Feldmann, H. (1988) tRNA genes – tinkering in organization and expression?, in *Evolutionary Tinkering in Gene Expression*, vol. **169**, NATO ASI Series A (ed. M. Grunberg-Manago), Plenum Press, New York, pp. 79–86.
- Felsenfeld, G. (1992) Chromatin as an essential part of the transcriptional mechanism. *Nature*, **355**, 219–224 (review).
- Feng, Q., Wang, H., Ng, H.H. *et al.* (2002) Methylation of H3-lysine 79 is mediated by a new family of HMTases without a SET domain. *Current Biology*, **12**, 1052–1058.
- Ferea, T.L., Botstein, D., Brown, P.O., and Rosenzweig, R.F. (1999) Systematic changes in gene expression patterns following adaptive evolution in yeast. *Proceedings of the National Academy of Sciences of the United States of America*, **96**, 9721–9726.
- Fernandes, L., Rodrigues-Pousada, C., and Struhl, K. (1997) Yap, a family of eight bZIP proteins in *Saccharomyces cerevisiae* with distinct biological functions. *Molecular and Cellular Biology*, **17**, 6982–6993.
- Fernandez-Martinez, J. and Rout, M.P. (2009) Nuclear Pore Complex Biogenesis. *Curr Opin Cell Biol.*, **21**, 603–612.
- Fernandez-Martinez, J. and Rout, M.P. (2009) Nuclear pore complex biogenesis. *Current Opinion in Cell Biology*, **21**, 603–612.
- Ferrari, S., Sanguinetti, M., De Bernardis, F. *et al.* (2011) Loss of mitochondrial functions associated with azole resistance in *Candida glabrata* results in enhanced virulence in mice. *Antimicrobial Agents and Chemotherapy*, **55**, 1852–1860.
- Ferrer-Miralles, N., Domingo-Espín, J., Corchero, J.L., Vázquez, E., and Villaverde, A. (2009) Microbial factories for recombinant pharmaceuticals. *Microbial Cell Factories*, **24** (8), 17.
- Ferro-Novick, S., Hansen, W., Schauer, I., and Schekman, R. (1984) Genes required for completion of import of proteins into the endoplasmic reticulum in yeast. *The Journal of Cell Biology*, **98**, 44–53.
- Feuermann, M., Francisci, S., Rinaldi, T. *et al.* (2003) The yeast counterparts of human “MELAS” mutations cause mitochondrial dysfunction that can be rescued by overexpression of the mitochondrial translation factor EF-Tu. *EMBO Reports*, **4**, 53–58.
- Fiaux, J., Cakar, Z.P., Sonderegger, M., Wuthrich, K., Szyperski, T., and Sauer, U. (2003) Metabolic-flux profiling of the yeasts *Saccharomyces cerevisiae* and *Pichia stipitis*. *Eukaryotic Cell*, **2**, 170–180.
- Fiedler, K., Veit, M., Stamnes, M.A., and Rothman, J.E. (1996) Bimodal interaction of coatomer with the p24 family of putative cargo receptors. *Science*, **273**, 1396–1399.
- Field, Y., Kaplan, N., Fondufe-Mittendorf, Y. *et al.* (2008) Distinct modes of regulation by chromatin encoded through nucleosome positioning signals. *PLoS Computational Biology*, **4**, e1000216.
- Fields, S. and Herskowitz, I. (1987) Regulation by the yeast mating-type locus of *STE12*, a gene required for cell-type-specific expression. *Molecular and Cellular Biology*, **7**, 3818–3821.
- Fields, S. and Johnston, M. (2005) Whither model organism research? *Science*, **307**, 1885–1886.
- Fields, S. and Song, O.K. (1989) A novel genetic system to detect protein–protein interactions. *Nature*, **340**, 245–246.
- Fields, S. (2001) Proteomics in genomeland. *Science*, **291**, 1221–1224.
- Fien, K. and Stillman, B. (1992) Identification of replication factor C from *Saccharomyces cerevisiae*: a component of the leading-strand DNA replication complex. *Molecular and Cellular Biology*, **12**, 155–163.
- Fillingame, R.H., Jiang, W., and Dmitriev, O.Y. (2000) Coupling H(+) transport to rotary catalysis in F-type ATP synthases: structure and organization of the transmembrane rotary motor. *Journal of Experimental Biology*, **203**, 9–17. Review.
- Fillingham, J. and Greenblatt, J.F. (2008) A histone code for chromatin assembly. *Cell*, **134**, 206–208.
- Fillingham, J., Recht, J., Silva, A.C. *et al.* (2008) Chaperone control of the activity and specificity of the histone H3 acetyltransferase Rtt109. *Molecular and Cellular Biology*, **28**, 4342–4353.
- Fillingham, J., Kainth, P., Lambert, J.P. *et al.* (2009) Two-color cell array screen reveals interdependent roles for histone chaperones and a chromatin boundary regulator in histone gene repression. *Molecular Cell*, **35**, 340–351.
- Finger, F.P. and Novick, P. (1998) Spatial regulation of exocytosis: lessons from yeast. *The Journal of Cell Biology*, **142**, 609–612 (review).
- Finger, F.P. (2002) One ring to bind them. Septins and actin assembly. *Developmental Cell*, **3**, 761–763.
- Fink, G., Farabaugh, P., Roeder, G., and Chaleff, D. (1981) Transposable elements (Ty) in yeast. *Cold Spring Harbor Symposia on Quantitative Biology*, **45**, 575–580.
- Fink, G.R. (1987) Pseudogenes in yeast? *Cell*, **49**, 5–6.
- Finlayson, M.R., Helfer-Hungerbuhler, A.K., and Philippsen, P. (2011) Regulation of exit from mitosis in multinucleate *Ashbya gossypii* cells relies on a minimal network of genes. *Molecular Biology of the Cell*, **22**, 3081–3093.
- Finley, D., Ciechanover, A., and Varshavsky, A. (1984) Thermolability of ubiquitin-activating enzyme from the mammalian cell cycle mutant ts85. *Cell*, **37**, 43–55.
- Finley, D., Tanaka, K., Mann, C. *et al.* (1998) Unified nomenclature for subunits of the *Saccharomyces cerevisiae* proteasome regulatory particle. *Trends in Biochemical Sciences*, **23**, 244–245.
- Finley, D., Ciechanover, A., and Varshavsky, A. (2004) Ubiquitin as a central cellular regulator. *Cell*, **116** (2 Suppl.), S29–S32.
- Finnegan, D.J., Rubin, G.M., Young, M.W., and Hogness, D.S. (1978) Repeated gene families in *Drosophila melanogaster*. *Cold Spring Harbor Symposia on Quantitative Biology*, **42**, 1053–1063.
- Finnis, C.J.A., Payne, T., Hay, J. *et al.* (2010) High-level production of animal-free recombinant transferrin from *Saccharomyces cerevisiae*. *Microbial Cell Factories*, **9**, 87.
- Fischbeck, J.A., Kraemer, S.M., and Stargell, L. A. (2002) SPN1, a conserved gene identified by suppression of a postrecruitment-defective yeast TATA-binding protein mutant. *Genetics*, **162**, 1605–1616.
- Fischer, N. and Weis, K. (2002) The DEAD box protein Dhh1 stimulates the decapping enzyme Dcp1. *The EMBO Journal*, **21**, 2788–2797.
- Fischer, G., James, S.A., Roberts, I.N., Oliver, S. G., and Louis, E.J. (2000) Chromosomal evolution in *Saccharomyces*. *Nature*, **405**, 451–454.
- Fischer, G., Neuvéglise, C., Durrens, P., Gaillardin, C., and Dujon, B. (2001) Evolution of gene order in the genomes of two related yeast species. *Genome Research*, **11**, 2009–2019.
- Fischer, G., Rocha, E.P.C., Brunet, F., Vergassola, M., and Dujon, B. (2006) Highly variable rates of genome rearrangements between hemiascomycetous yeast lineages. *PLoS Genetics*, **2**, e32.
- Fisher, T.S., Taggart, A.K.P., and Zakian, V.A. (2004) Cell cycle-dependent regulation of yeast telomerase by Ku. *Nature Structural & Molecular Biology*, **11**, 1198–1205.
- Fisk, H.A. and Yaffe, M.P. (1997) Mutational analysis of Mdm1p function in nuclear and mitochondrial inheritance. *The Journal of Cell Biology*, **138**, 485–494.
- Fitch, I., Dahmann, C., Surana, U. *et al.* (1992) Characterization of four B-type cyclin genes of the budding yeast *Saccharomyces cerevisiae*. *Molecular Biology of the Cell*, **3**, 805–818.
- Fitzgerald-Hayes, M., Clarke, L., and Carbon, J. (1982) Nucleotide sequence comparisons and functional analysis of yeast centromere DNAs. *Cell*, **29**, 235–244.
- Fitzpatrick, D.A., Logue, M.E., Stajich, J.E., and Butler, G. (2006) A fungal phylogeny based on 42 complete genomes derived from supertree and combined gene analysis. *BMC Evolutionary Biology*, **6**, 99.
- Fitzpatrick, D.A., Logue, M.E., and Butler, G. (2008) Evidence of recent interkingdom horizontal gene transfer between bacteria and *Candida parapsilosis*. *BMC Evolutionary Biology*, **8**, 181.
- Fitzpatrick, D.A., O’Gaora, P., Byrne, K.P., and Butler, G. (2010) Analysis of gene evolution and metabolic pathways using the Candida Gene Order Browser. *BMC Genomics*, **11**, 290.
- Flanagan, P.M., Kelleher, R.J., Sayre, M.H., Tschochner, H., and Kornberg, R.D. (1991) A mediator required for activation of RNA polymerase II transcription *in vitro*. *Nature*, **350**, 436–438.
- Fleet, G.H. (1991) Cell walls, in *The Yeasts*, 2nd edn, vol. **4**, **Yeast Organelles** (eds A.H. Rose and J.S. Harrison), Academic Press, London, pp. 199–277.
- Fleming, W. (1879) Beitrage zur Kenntniss der Zelle und ihrer Lebenserscheinungen, Theil II. *Archiv für Mikroskopische Anatomie*, **18**, 151–259.
- Flescher, E.G., Madden, K., and Snyder, M. (1993) Components required for cytokinesis are important for bud site selection in yeast. *The Journal of Cell Biology*, **122**, 373–386.
- Flores, O., Maldonado, E., and Reinberg, D. (1989) Factors involved in specific

- transcription by mammalian RNA polymerase II. Factors IIE and IIF independently interact with RNA polymerase II. *The Journal of Biological Chemistry*, **264**, 8913–8921.
- Flores, A., Briand, J.F., Gadal, O. *et al.* (1999) A protein–protein interaction map of yeast RNA polymerase III. *Proceedings of the National Academy of Sciences of the United States of America*, **96**, 7815–7820.
- Flores, C.L., Rodriguez, C., Petit, T., and Gancedo, C. (2000) Carbohydrate and energy-yielding metabolism in non-conventional yeasts. *FEMS Microbiology Reviews*, **24**, 507–529.
- Flynn, G.C., Pohl, J., Flocco, M.T., and Rothman, J.E. (1991) Peptide-binding specificity of the molecular chaperone BiP. *Nature*, **353**, 726–730.
- Fogel, S. and Welch, J.W. (1982) Tandem gene amplification mediates copper resistance in yeast. *Proceedings of the National Academy of Sciences of the United States of America*, **79**, 5342–5346.
- Folco, H.D., Pidoux, A.L., Urano, T., and Allshire, R.C. (2008) Heterochromatin and RNAi are required to establish CENP-A chromatin at centromeres. *Science*, **319**, 94–97.
- Forche A, Magee PT, Selmecki A, Berman J, and May G. (2006) Evolution in *Candida albicans* populations during a single passage through a mouse host. *Genetics* **182**: 799–811.
- Forche, A., Magee, P.T., Selmecki, A., Berman, J., and May, G. (2009) Evolution in *Candida albicans* populations during a single passage through a mouse host. *Genetics*, **182**, 799–811.
- Ford, S.K. and Pringle, J.R. (1991) Cellular morphogenesis in the *Saccharomyces cerevisiae* cell cycle: localization of the *CDC11* gene product and the timing of events at the budding site. *Developmental Genetics*, **12**, 281–292.
- Formosa, T., Eriksson, P., Wittmeyer, J., Ginn, J., Yu, Y., and Stillman, D.J. (2001) Spt16–Pob3 and the HMG protein Nhp6 combine to form the nucleosome-binding factor SPN. *The EMBO Journal*, **20**, 3506–3517.
- Formosa, T. (2008) FACT and the reorganized nucleosome. *Molecular BioSystems*, **4**, 1085–1093.
- Forster, A., Aurich, A., Mauersberger, S., and Barth, G. (2007) Citric acid production from sucrose using a recombinant strain of the yeast *Yarrowia lipolytica*. *Applied and Environmental Microbiology*, **75**, 1409–1417.
- Foss, M., McNally, F.J., Laurenson, P., and Rine, J. (1993) Origin recognition complex (ORC) in transcriptional silencing and DNA replication in *S. cerevisiae*. *Science*, **262**, 1838–1844.
- Fossati, T., Solinas, N., Porro, D., and Branduardi, P. (2011) L-Ascorbic acid producing yeasts learn from plants how to recycle it. *Metabolic Engineering*, **13**, 177–185.
- Fournier, P., Abbas, A., Chasles, M. *et al.* (1993) Colocalization of centromeric and replicative functions on autonomously replicating sequences isolated from the yeast *Yarrowia lipolytica*. *Proceedings of the National Academy of Sciences of the United States of America*, **90**, 4912–4916.
- Foury, F. and Cazzalini, O. (1997) Deletion of the yeast homologue of the human gene associated with Friedreich's ataxia elicits iron accumulation in mitochondria. *FEBS Letters*, **411**, 373–377.
- Foury, F. and Kucej, M. (2002) Yeast mitochondrial biogenesis: a model system for humans? *Current Opinion in Chemical Biology*, **6**, 106–111.
- Foury, F. and Talibi, D. (2001) Mitochondrial control of iron homeostasis. A genome wide analysis of gene expression in a yeast frataxin-deficient strain. *The Journal of Biological Chemistry*, **276**, 7762–7768.
- Foury, F. and Tzagoloff, A. (1978) Assembly of the mitochondrial membrane system. Genetic complementation of *mit⁻* mutations in mitochondrial DNA of *Saccharomyces cerevisiae*. *The Journal of Biological Chemistry*, **253**, 3792–3797.
- Foury, F., Amory, A., and Goffeau, A. (1981) Large-scale purification and phosphorylation of a detergent-treated adenosine triphosphatase complex from plasma membrane of *Saccharomyces cerevisiae*. *European Journal of Biochemistry*, **119**, 395–400.
- Foury, F., Roganti, T., Lecrenier, N., and Purnelle, B. (1998) The complete sequence of the mitochondrial genome of *Saccharomyces cerevisiae*. *FEBS Letters*, **440**, 325–331.
- Foury, F., Hu, J., and Vanderstraeten, S. (2004) Mitochondrial DNA mutators. *Cellular and Molecular Life Sciences*, **61**, 2799–2811.
- Foury, F. (1997) Human genetic diseases: a cross-talk between man and yeast. *Genetics*, **195**, 1–10 (review).
- Fox, G.C., Shafiq, M., Briggs, D.C. *et al.* (2007) Redox-mediated substrate recognition by Sdp1 defines a new group of tyrosine phosphatases. *Nature*, **447**, 487–492.
- Fradin, A., Gruhl, H., and Feldmann, H. (1975) Mapping of yeast tRNAs by two-dimensional electrophoresis in polyacrylamide gels. *FEBS Letters*, **50**, 185–189.
- Frank, A.C. and Wolfe, K.H. (2009) Evolutionary capture of viral and plasmid DNA by yeast nuclear chromosomes. *Eukaryotic Cell*, **8**, 1521–1531.
- Franssens, V., Boelen, E., Anandhakumar, J., Vanhelmont, T., Buttner, S., and Winderickx, J. (2010) Yeast unfolds the road map toward α -synuclein-induced cell death. *Cell Death and Differentiation*, **17**, 746–753.
- Franzusoff, A., Duke, R.C., King, T.H., Lu, Y., and Rodell, T.C. (2005) Yeasts encoding tumour antigens in cancer immunotherapy. *Expert Opinion on Biological Therapy*, **5**, 565–575 (review).
- Fratti, R.A., Jun, Y., Merz, A.J., Margolis, N., and Wickner, W. (2004) Interdependent assembly of specific regulatory lipids and membrane fusion proteins into the vertex ring domain of docked vacuoles. *The Journal of Cell Biology*, **167**, 1087–1098.
- Frazzon, J. and Dean, D.R. (2003) Formation of iron–sulfur clusters in bacteria: an emerging field in bioinorganic chemistry. *Current Opinion in Chemical Biology*, **7**, 166–173.
- Frechin, M., Kern, D., Martin, R.P., Becker, H. D., and Senger, B. (2010) Arc1p: anchoring, routing, coordinating. *FEBS Letters*, **584**, 427–433.
- Freeman, L., Aragon-Alcaide, L., and Strunnikov, A. (2000) The condensin complex governs chromosome condensation and mitotic transmission of rDNA. *The Journal of Cell Biology*, **149**, 811–824.
- Freese, S., Vogts, T., Speer, F., Schafer, B., Passoth, V., and Klinner, U. (2011) C- and N-catabolic utilization of tricarboxylic acid cycle-related amino acids by *Scheffersomyces stipitis* and other yeasts. *Yeast (Chichester, England)*, **28**, 375–390.
- Frey, S., Richter, R.P., and Görlich, D. (2006) FG-rich repeats of nuclear pore proteins form a three-dimensional meshwork with hydrogel-like properties. *Science*, **314**, 815–817.
- Fried, H.M., Pearson, N.J., Kim, C.H., and Warner, J.R. (1981) The genes for fifteen ribosomal proteins of *Saccharomyces cerevisiae*. *The Journal of Biological Chemistry*, **256**, 10176–10183.
- Frieman, M.B. and Cormack, B.P. (2004) Multiple sequence signals determine the distribution of glycosylphosphatidylinositol proteins between the plasma membrane and cell wall in *Saccharomyces cerevisiae*. *Microbiology*, **150**, 3105–3114.
- Fromme, J.C., Orci, L., and Schekman, R. (2008) Coordination of COPII vesicle trafficking by Sec23. *Trends in Cell Biology*, **18**, 330–6.
- Fromont-Racine, M., Mayes, A.E., Brunet-Simon, A. *et al.* (2000) Genome-wide protein interaction screens reveal functional networks involving Sm-like proteins. *Yeast (Chichester, England)*, **17**, 95–110.
- Fromont-Racine, M., Rain, J.C., and Legrain, P. (2002) Building protein–protein networks by two-hybrid mating strategy. *Methods in Enzymology*, **350**, 513–524.
- Förster, J., Famili, I., Fu, P., Palsson, B.é., and Nielsen, J. (2003) Genome-scale reconstruction of the *Saccharomyces cerevisiae* metabolic network. *Genome Research*, **13**, 244–253.
- Fuchs, S.M., Larabee, R.N., and Strahl, B.D. (2009) Protein modifications in transcription elongation. *Biochimica et Biophysica Acta*, **1789**, 26–36.
- Fujii, K., Kitabatake, M., Sakata, T., Miyata, A., and Ohno, M. (2009) A role for ubiquitin in the clearance of nonfunctional rRNAs. *Genes and Development*, **23**, 963–974.
- Fujimoto, M., Tanaka, K., Yokosawa, H., and Toh-e, A. (1998) Son1p is a component of the 26S proteasome of the yeast *Saccharomyces cerevisiae*. *FEBS Letters*, **423**, 149–154.
- Fujimura, H. (1991) Transformation of the yeast *Saccharomyces kluyveri* by *Saccharomyces cerevisiae*-based plasmids. *FEMS Microbiology Letters*, **66**, 149–152.
- Fujita, M., Yoko-o, T., and Jigami, Y. (2006) Inositol deacylation by Bst1p is required for the quality control of glycosylphosphatidylinositol-anchored proteins. *Molecular Biology of the Cell*, **17**, 834–850.
- Fukuda, R., McNew, J.A., Weber, T. *et al.* (2000) Functional architecture of an intracellular membrane t-SNARE. *Nature*, **407**, 198–202.
- Fukuda, T., Nogami, S., and Ohya, Y. (2003) VDE-initiated intein homing in *Saccharomyces cerevisiae* proceeds in a meiotic recombination-like manner. *Genes to Cells*, **8**, 587–602.
- Fukuda, K., Jin-Shan, C., Kawano, M., Sudo, K., and Gunge, N. (2004) Stress responses of linear plasmids from *Debaryomyces hansenii*. *FEMS Microbiology Letters*, **15**, 243–248.

- Fukuda, H., Sano, N., Muto, S., and Horikoshi, M. (2009) Simple histone acetylation plays a complex role in the regulation of gene expression. *Briefings in Functional Genomics*, **5**, 190–208.
- Fukuhara, H. (1995) Linear DNA plasmids of yeasts. *FEMS Microbiology Letters*, **131**, 1–9. Review.
- Fukuhara, H. (2003) The Kluyver effect revisited. *FEMS Yeast Research*, **3**, 327–331.
- Fukuhara, H. (2006) *Kluyveromyces lactis* – a retrospective. *FEMS Yeast Research*, **6**, 323–324.
- Fuller, B.G. and Stukenberg, P.T. (2009) Cell division: righting the check. *Current Biology*, **19**, R550–R553.
- Fulton, A.M., Mellor, J., Dobson, M.J. *et al.* (1985) Variants within the yeast Ty sequence family encode a class of structurally conserved proteins. *Nucleic Acids Research*, **13**, 4097–4112.
- Furuchi, T., Ishikawa, H., Miura, N. *et al.* (2001) Two nuclear proteins, Cin5 and Ydr259c, confer resistance to cisplatin in *Saccharomyces cerevisiae*. *Molecular Pharmacology*, **59**, 470–474.
- Furukawa, Y., Torres, A.S., and O'Halloran, T.V. (2004) Oxygen-induced maturation of SOD1: a key role for disulfide formation by the copper chaperone CCS. *The EMBO Journal*, **23**, 2872–2881.
- Futcher, A.B. (1988) The 2 micron circle plasmid of *Saccharomyces cerevisiae*. *Yeast (Chichester, England)*, **4**, 27–40.
- Futcher, B. (2000) Microarrays and cell cycle transcription in yeast. *Current Opinion in Cell Biology*, **12**, 710–715. Review.
- Futcher, B. (2002) Transcriptional regulatory networks and the yeast cell cycle. *Current Opinion in Cell Biology*, **14**, 676–683.
- Gabriel, K., Milenkovic, D., Chacinska, A. *et al.* (2007) Novel mitochondrial intermembrane space proteins as substrates of the MIA import pathway. *Journal of Molecular Biology*, **365**, 612–620.
- Gabrielsen, O.S. and Sentenac, A. (1991) RNA polymerase III (C) and its transcription factors. *Trends in Biochemical Sciences*, **16**, 412–416 (review).
- Gabrielsen, O.S., Marzouki, N., Ruet, A., Sentenac, A., and Fromageot, P. (1989) Two polypeptide chains in yeast transcription factor tau interact with DNA. *The Journal of Biological Chemistry*, **264**, 7505–7511.
- Gabriely, G., Kama, R., and Gerst, J.E. (2007) Involvement of specific COPI subunits in protein sorting from the late endosome to the vacuole in yeast. *Molecular and Cellular Biology*, **27**, 526–540.
- Gadal, O., Strauss, D., Braspenning, J. *et al.* (2001a) A nuclear AAA-type ATPase (Rix7p) is required for biogenesis and nuclear export of 60S ribosomal subunits. *The EMBO Journal*, **20**, 3695–3704.
- Gadal, O., Strauss, D., Kessl, J., Trumpower, B., Tollervey, D., and Hurt, E. (2001b) Nuclear export of 60S ribosomal subunits depends on Xpo1p and requires a NES-containing factor Nmd3p that associates with the large subunit protein Rpl10p. *Molecular and Cellular Biology*, **21**, 3405–3415.
- Gadbois, E.L., Chao, D.M., Reese, J.C., Green, M.R., and Young, R.A. (1997) Functional antagonism between RNA polymerase II holoenzyme and global negative regulator NC2 *in vivo*. *Proceedings of the National Academy of Sciences of the United States of America*, **94**, 3145–3150.
- Gaillardin, C., Duchateau-Nguyen, G., Tekaia, B. *et al.* (2000) Genomic exploration of the hemiascomycetous yeasts. 21. Comparative functional classification of genes. *FEBS Letters*, **487**, 134–149.
- Galan, J.M. and Peter, M. (1999) Ubiquitin-dependent degradation of multiple F-box proteins by an autocatalytic mechanism. *Proceedings of the National Academy of Sciences of the United States of America*, **96**, 9124–9129.
- Galan, J.M., Moreau, V., Andre, B., Volland, C., and Haguenaer-Tsapis, R. (1996) Ubiquitination mediated by the Npi1p/Rsp5p ubiquitin–protein ligase is required for endocytosis of the yeast uracil permease. *The Journal of Biological Chemistry*, **271**, 10946–10952.
- Galao, R.P., Scheller, N., Alves-Rodrigues, I., Breinig, T., Meyerhans, A., and Diez, J. (2007) *Saccharomyces cerevisiae*: a versatile eukaryotic system in virology. *Microbial Cell Factories*, **10** (6), 32 (review).
- Galeote, V.A., Alexandre, H., Bach, B., Delobel, P., Dequin, S., and Blondin, B. (2007) Sfl1p acts as an activator of the HSP30 gene in *Saccharomyces cerevisiae*. *Current Genetics*, **52**, 55–63.
- Galeote, V., Bigey, F., Beyne, E. *et al.* (2011) Amplification of a *Zygosaccharomyces bailii* DNA segment in wine yeast genomes by extrachromosomal circular DNA formation. *PLoS One*, **6**, e17872.
- Galitski, T., Saldanha, A.J., Styles, C.A., Lander, E.S., and Fink, G.R. (1999) Ploidy regulation of gene expression. *Science*, **285**, 251–254.
- Galluhn, D. and Langer, T. (2004) Reversible assembly of the ATP-binding cassette transporter Mdl1 with the F₁F₀-ATP synthase in mitochondria. *The Journal of Biological Chemistry*, **279**, 38338–38345.
- Gallwitz, D. and Sures, I. (1980) Structure of a split yeast gene: complete nucleotide sequence of the actin gene in *Saccharomyces cerevisiae*. *Proceedings of the National Academy of Sciences of the United States of America*, **77**, 2546–2550.
- Gallwitz, D., Perrin, F., and Seidel, R. (1981) The actin gene in yeast *Saccharomyces cerevisiae*: 5' and 3' end mapping, flanking and putative regulatory sequences. *Nucleic Acids Research*, **9**, 6339–6350.
- Galy, V., Gadal, O., Fromont-Racine, M., Romano, A., Jacquier, A., and Nehrbass, U. (2004) Nuclear retention of unspliced mRNAs in yeast is mediated by perinuclear Mlp1. *Cell*, **116**, 63–73.
- Ganapathi, M., Palumbo, M.J., Ansari, S.A. *et al.* (2011) Extensive role of the general regulatory factors, Abf1 and Rap1, in determining genome-wide chromatin structure in budding yeast. *Nucleic Acids Research*, **39**, 2032–2044.
- Gancedo, C. and Flores, C.L. (2004) The importance of a functional trehalose biosynthetic pathway for the life of yeasts and fungi. *FEMS Yeast Research*, **4**, 351–359 (review).
- Gancedo, C. and Flores, C.L. (2008) Moonlighting proteins in yeasts. *Microbiology and Molecular Biology Reviews*, **72**, 197–210.
- Gancedo, J.M. (1998) Yeast carbon catabolite repression. *Microbiology and Molecular Biology Reviews*, **62**, 334–361.
- Gandhi, M., Smith, B.A., Bovellan, M. *et al.* (2010) GMF is a cofilin homolog that binds Arp2/3 complex to stimulate filament debranching and inhibit actin nucleation. *Current Biology*, **20**, 861–867.
- Gao, M. and Kaiser, C.A. (2006) A conserved GTPase-containing complex is required for intracellular sorting of the general amino acid permease in yeast. *Nature Cell Biology*, **8**, 657–667.
- García-Mata, R., Szul, T., Alvarez, C., and Sztul, E. (2003) ADP-ribosylation factor/COPI-dependent events at the endoplasmic reticulum-Golgi interface are regulated by the guanine nucleotide exchange factor GBF1. *Molecular Biology of the Cell*, **14**, 2250–2261.
- Garneau, N.L., Wilusz, J., and Wilusz, C.J. (2007) The highways and byways of mRNA decay. *Nature Reviews Molecular Cell Biology*, **8**, 113–126.
- Gartenberg, M.R. (1999) The Sir proteins of *Saccharomyces cerevisiae*: mediators of transcriptional silencing and much more. *Current Opinion in Microbiology*, **3**, 132–137 (review).
- Gasch, A.P., Spellman, P.T., Kao, C.M. *et al.* (2000) Genomic expression programs in the response of yeast cells to environmental changes. *Molecular Biology of the Cell*, **11**, 4241–4257.
- Gasch, A.P., Moses, A.M., Chiang, D.Y. *et al.* (2004) Conservation and evolution of cis-regulatory systems in ascomycete fungi. *PLoS Biology*, **2**, e398.
- Gasser, S.M. and Cockell, M.M. (2001) The molecular biology of the SIR proteins. *Genetics*, **279**, 1–16 (review).
- Gasser, B. and Mattanovich, D. (2007) Antibody production with yeasts and filamentous fungi: on the road to large scale? *Biotechnology Letters*, **29**, 201–212 (review).
- Gasser, S.M., Ohashi, A., Daum, G. *et al.* (1982) Imported mitochondrial proteins cytochrome *b*₂ and cytochrome *c*₁ are processed in two steps. *Proceedings of the National Academy of Sciences of the United States of America*, **79**, 267–271.
- Gasser, B., Maurer, M., Gach, J., Kunert, R., and Mattanovich, D. (2006) Engineering of *Pichia pastoris* for improved production of antibody fragments. *Biotechnology and Bioengineering*, **94**, 353–361.
- Gasser, B., Maurer, M., Rautio, J. *et al.* (2007) Monitoring of transcriptional regulation in *Pichia pastoris* under protein production conditions. *BMC Genomics*, **8**, 179.
- Gasser, B., Dragosits, M., and Mattanovich, D. (2010) Engineering of biotin-prototrophy in *Pichia pastoris* for robust production processes. *Metabolic Engineering*, **12**, 573–580.
- Gavin, A.-C., Bosche, M., Krause, R. *et al.* (2002) Functional organization of the yeast proteome by systematic analysis of protein complexes. *Nature*, **415**, 141–147.
- Gavin, A.-C., Aloy, P., Grandi, P. *et al.* (2006) Proteome survey reveals modularity of the yeast cell machinery. *Nature*, **440**, 631–636.
- Gavrias, V., Andrianopoulos, A., Gimeno, C.J., and Timberlake, W.E. (1996) *Saccharomyces cerevisiae* TEC1 is required for pseudohyphal

- growth. *Molecular Microbiology*, **19**, 1255–1263.
- Gaynor, E.C., Mondesert, G., Grimme, S.J., Reed, S.I., Orlean, P., and Emr, S.D. (1999) MCD4 encodes a conserved endoplasmic reticulum membrane protein essential for glycosylphosphatidylinositol anchor synthesis in yeast. *Molecular Biology of the Cell*, **10**, 627–648.
- Geiduschek, E.P. and Kassavetis, G.A. (2001) The RNA polymerase III transcription apparatus. *Journal of Molecular Biology*, **310**, 1–26.
- Geiduschek, E.P. and Tocchini-Valentini, G.P. (1988) Transcription by RNA polymerase III. *Annual Review of Biochemistry*, **57**, 873–914 (review).
- Geissler, A., Chacinska, A., Truscott, K.N. *et al.* (2002) The mitochondrial presequence translocase: an essential role of Tim50 in directing preproteins to the import channel. *Cell*, **111**, 507–518.
- Geladé, R., Van de Velde, S., Van Dijk, P., and Thevelein, J.M. (2003) Multi-level response of the yeast genome to glucose. *Genome Biology*, **4**, 233.
- Geli, V., Yang, M.J., Suda, K., Lustig, A., and Schatz, G. (1990) The MAS-encoded processing protease of yeast mitochondria. Overproduction and characterization of its two nonidentical subunits. *The Journal of Biological Chemistry*, **265**, 19216–19222.
- Gelinas, R.E. and Roberts, R.J. (1977) One predominant 5'-undecanucleotide in adenovirus 2 late messenger RNAs. *Cell*, **11**, 533–544.
- Gelperin, D., Horton, L., Beckman, J., Hensold, J., and Lemmon, S.K. (2001) Bms1p, a novel GTP-binding protein and the related Tsr1p are required for distinct steps of 40S ribosome biogenesis in yeast. *RNA (New York, NY)*, **7**, 1268–1283.
- Gelperin, D.M., White, M.A., Wilkinson, M.L. *et al.* (2005) Biochemical and genetic analysis of the yeast proteome with a movable ORF collection. *Genes and Development*, **19**, 2816–2826.
- Georgieva, B. and Rothstein, R. (2002) *Kar*-mediated plasmid transfer between yeast strains, alternative to traditional transformation methods. *Methods in Enzymology*, **350**, 278–289.
- Georis, I., Cassart, J.P., Breunig, K.D., and Vandenhaute, J. (1999) Glucose repression of the *Kluyveromyces lactis* invertase gene KIINV1 does not require Mig1p. *Molecular and General Genetics*, **261**, 862–870.
- Gerber, A.P. and Keller, W. (1999) An adenosine deaminase that generates inosine at the wobble position of tRNAs. *Science*, **286**, 1146–1149.
- Gerber, A.P. and Keller, W. (2001) RNA editing by base deamination: more enzymes, more targets, new mysteries. *Trends in Biochemical Sciences*, **26**, 376–384 (review).
- Gerber, J., Muhlenhoff, U., and Lill, R. (2003) An interaction between frataxin and Isu1/Nfs1 that is crucial for Fe/S cluster synthesis on Isu1. *EMBO Reports*, **4**, 906–911.
- Gerber, J., Neumann, K., Prohl, C., Muhlenhoff, U., and Lill, R. (2004) The yeast scaffold proteins Isu1p and Isu2p are required inside mitochondria for maturation of cytosolic Fe/S proteins. *Molecular and Cellular Biology*, **24**, 4848–4857.
- Gerton, J.L., DeRisi, J., Shroff, R., Lichten, M., Brown, P.O., and Petes, T.D. (2000) Global mapping of meiotic recombination hotspots and coldspots in the yeast *Saccharomyces cerevisiae*. *Proceedings of the National Academy of Sciences of the United States of America*, **97**, 11383–11390.
- Ghislain, M., Udvardy, A., and Mann, C. (1993) *S. cerevisiae* 26S protease mutants arrest cell division in G₂/metaphase. *Nature*, **366**, 358–362.
- Ghislain, M., Dohmen, R.J., Levy, F., and Varshavsky, A. (1996) Cdc48p interacts with Ufd3p, a WD repeat protein required for ubiquitin-mediated proteolysis in *Saccharomyces cerevisiae*. *The EMBO Journal*, **15**, 4884–4899.
- Ghosh, R.K. and Deutscher, M.P. (1980) The purification of 3' processing nucleases using synthetic tRNA precursors, in *Transfer RNA – Biological Aspects* (eds D. Söll, J.N. Abelson, and P.R. Schimmel), Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, pp. 59–69.
- Ghosh, S.K., Hajra, S., and Jayaram, M. (2007) Faithful segregation of the multicopy yeast plasmid through cohesin-mediated recognition of sisters. *Proceedings of the National Academy of Sciences of the United States of America*, **104**, 13034–13039.
- Gibson, D., Benders, G., Axelrod, K. *et al.* (2008) One-step assembly in yeast of 25 overlapping DNA fragments to form a complete synthetic *Mycoplasma genitalium* genome. *Proceedings of the National Academy of Sciences of the United States of America*, **105**, 20404–20409.
- Giegé, R., Florentz, C., Garcia, A. *et al.* (1990) Exploring the aminoacylation function of transfer RNA by macromolecular engineering approaches. Involvement of conformational features in the charging process of yeast tRNA^{Asp}. *Biochimie*, **72**, 453–461 (review).
- Giegé, R. (2008) Toward a more complete view of tRNA biology. *Nature Structural & Molecular Biology*, **15**, 1007–1014.
- Gietz, D., St Jean, A., Woods, R.A., and Schiestl, R.H. (1992) Improved method for high efficiency transformation of intact yeast cells. *Nucleic Acids Research*, **20**, 1425.
- Gilbert, W. (1978) Why genes in pieces? *Nature*, **271**, 501.
- Gilbert, W. (1981) DNA sequencing and gene structure. Nobel Lecture, 8 December 1980. *Bioscience Reports*, **1**, 353–375 (review).
- Gillam, S., Rottman, F., Jahnke, P., and Smith, M. (1977) Enzymatic synthesis of oligonucleotides of defined sequence: synthesis of a segment of yeast iso-1-cytochrome *c* gene. *Proceedings of the National Academy of Sciences of the United States of America*, **74**, 96–100.
- Gillett, E.S., Espelin, C.W., and Sorger, P.K. (2004) Spindle checkpoint proteins and chromosome-microtubule attachment in budding yeast. *The Journal of Cell Biology*, **164**, 535–546.
- Gilmore, R. and Blobel, G. (1983) Transient involvement of signal recognition particle and its receptor in the microsomal membrane prior to protein translocation. *Cell*, **35**, 677–685.
- Gilstring, C.F., Melin-Larsson, M., and Ljungdahl, P.O. (1999) Shr3p mediates specific COPII coatome–cargo interactions required for the packaging of amino acid permeases into ER-derived transport vesicles. *Molecular Biology of the Cell*, **10**, 3549–3565.
- Gimeno, C.J. and Fink, G.R. (1994) Induction of pseudohyphal growth by overexpression of *PHD1*, a *Saccharomyces cerevisiae* gene related to transcriptional regulators of fungal development. *Molecular and Cellular Biology*, **14**, 2100–2112.
- Giorgini, F. and Muchowski, P.J. (2006) Screening for genetic modifiers of amyloid toxicity in yeast. *Methods in Enzymology*, **412**, 201–222 (review).
- Giorgini, F., Guidetti, P., Nguyen, Q., Bennett, S.C., and Muchowski, P.J. (2005) A genomic screen in yeast implicates kynurenine 3-monooxygenase as a therapeutic target for Huntington disease. *Nature Genetics*, **37**, 526–531.
- Giorgini, F., Möller, T., Kwan, W. *et al.* (2008) Histone deacetylase inhibition modulates kynurenine pathway activation in yeast, microglia, and mice expressing a mutant huntingtin fragment. *The Journal of Biological Chemistry*, **283**, 7390–7400.
- Giresi, P.G., Gupta, M., and Lieb, J.D. (2006) Regulation of nucleosome stability as a mediator of chromatin function. *Current Opinion in Genetics & Development*, **16**, 171–176.
- Girzalski, W., Platta, H.W., and Erdmann, R. (2009) Protein transport across the peroxisomal membrane. *Biological Chemistry*, **390**, 745–751.
- Gitan, R.S. and Eide, D.J. (2000) Zinc-regulated ubiquitin conjugation signals endocytosis of the yeast *ZRT1* zinc transporter. *The Biochemical Journal*, **346**, 329–336.
- Gitler, A.D. (2008) Beer and bread to brains and beyond: can yeast cells teach us about neurodegenerative disease? *Neuro-Signals*, **16**, 52–62 (review).
- Gkikopoulos, T.M., Havas, K.M., Dewar, H., and Owen-Hughes, T. (2009) SWI/SNF and Asf1p cooperate to displace histones during induction of the *Saccharomyces cerevisiae* HO promoter. *Molecular and Cellular Biology*, **29**, 4057–4066.
- Gladfelter, A.S., Pringle, J.R., and Lew, D.J. (2001) The septin cortex at the yeast mother-bud neck. *Current Opinion in Microbiology*, **4**, 681–689.
- Glick, B.R. and Pasternak, J.J. (eds) (1998) *Molecular Biotechnology: Principles and Applications of Recombinant DNA*, 2nd edn, American Society for Microbiology, Washington, DC.
- Glick, B.S., Brandt, A., Cunningham, K., Muller, S., Hallberg, R.L., and Schatz, G. (1992) Cytochromes *c*₁ and *b*₂ are sorted to the intermembrane space of yeast mitochondria by a stop-transfer mechanism. *Cell*, **69**, 809–822.
- Glick, B.S. (2000) Organization of the Golgi apparatus. *Curr. Opin. Cell Biol.*, **12**, 450–456.
- Glick, B.S. (2000) Organization of the Golgi apparatus. *Current Opinion in Cell Biology*, **12**, 450–456.
- Glickman, M.H. and Ciechanover, A. (2002) The ubiquitin–proteasome proteolytic pathway: destruction for the sake of construction. *Physiological Reviews*, **82**, 373–428 (review).

- Glickman, M. and Raveh, D. (2005) Proteasome plasticity. *FEBS Letters*, **579**, 3214–3223.
- Glickman, M.H., Rubin, D.M., Fu, H. *et al.* (1999) Functional analysis of the proteasome regulatory particle. *Molecular Biology Reports*, **26**, 21–28 (review).
- Glotzer, M., Murray, A.W., and Kirschner, M.W. (1991) Cyclin is degraded by the ubiquitin pathway. *Nature*, **349**, 132–138.
- Glover, J.N. and Harrison, S.C. (1995) Crystal structure of the heterodimeric bZIP transcription factor c-Fos–c-Jun bound to DNA. *Nature*, **373**, 257–261.
- Glover, J.R. and Lindquist, S. (1998) Hsp104, Hsp70, and Hsp40: a novel chaperone system that rescues previously aggregated proteins. *Cell*, **94**, 73–82.
- Génolevures Consortium (2009) Comparative genomics of protoploid Saccharomycetaceae. *Genome Research*, **19**, 1696–1709.
- Goebel, M.G., Yochem, J., Jentsch, S., McGrath, J.P., Varshavsky, A., and Byers, B. (1988) The yeast cell cycle gene *CDC34* encodes a ubiquitin-conjugating enzyme. *Science*, **241**, 1331–1335.
- Goehler, H., Lalowski, M., Stelzl, U. *et al.* (2004) A protein interaction network links G1T1, an enhancer of huntingtin aggregation, to Huntington's disease. *Molecular Cell*, **15**, 853–865.
- Goffeau, A. and Boutry, M. (1986) Three proton-pumping ATPases in yeast. *Microbiological Sciences*, **3**, 164–168 (review).
- Goffeau, A., Amory, A., Villalobo, A., and Dufour, J.P. (1982) The H⁺-ATPase of the yeast plasma membrane. *Annals of the New York Academy of Sciences*, **402**, 91–98.
- Goffeau, A., Barrell, B.G., Bussey, H. *et al.* (1996) Life with 6000 genes. *Science*, **274**, 563–567 (review).
- Goffeau, A., Aert, R., Agostini, M.L. *et al.* (1997a) The yeast genome directory. *Nature*, **387** (6632 Suppl.), 1–105.
- Goffeau, A., Park, J., Paulsen, I.T. *et al.* (1997b) Multidrug-resistant transport proteins in yeast: complete inventory and phylogenetic characterization of yeast open reading frames with the major facilitator superfamily. *Yeast (Chichester, England)*, **13**, 43–54.
- Goffeau, A. (2004) Yeast transport ATPases and the yeast genome project, in *Selected Topics in the History of Biochemistry: Personal Recollections*. VIII, vol. 48, Comprehensive Biochemistry (eds G. Semenza and A.J. Turner), Elsevier, Amsterdam, pp. 493–536.
- Goffrini, P., Ferrero, I., and Donnini, C. (2002) Respiration-dependent utilization of sugars in yeasts, a determinant role for sugar transporters. *Journal of Bacteriology*, **184**, 427–432.
- Gojkovic, Z., Knecht, W., Zameitat, E. *et al.* (2004) Horizontal gene transfer promoted evolution of the ability to propagate under anaerobic conditions in yeasts. *Molecular Genetics and Genomics*, **271**, 387–393.
- Gombault, A., Godin, F., Sy, D. *et al.* (2007) Molecular basis of the *tfsl1/ira2* interaction: a combined protein engineering and molecular modelling study. *Journal of Molecular Biology*, **374**, 604–617.
- Gomez-Lopez, A., Pan, D., Cuesta, I., Alastruey-Izquierdo, A., Rodriguez-Tudela, J.L., and Cuenca-Estrella, M. (2010) Molecular identification and susceptibility profile *in vitro* of the emerging pathogen *Candida kefyr*. *Diagnostic Microbiology and Infectious Disease*, **66**, 116–119.
- Gonda, D.K., Bachmair, A., Wunning, I., Tobias, J.W., Lane, W.S., and Varshavsky, A. (1989) Universality and structure of the N-end rule. *The Journal of Biological Chemistry*, **264**, 16700–16712.
- Gonzalez, S., Barrio, E., and Querol, A. (2008) Molecular characterization of new natural hybrids of *Saccharomyces cerevisiae* and *S. kudriavzevii* in brewing. *Applied Environmental Microbiology*, **74**, 2314–2320.
- Gonzalez, N.A., Vazquez, A., Ortiz Zuazaga, H. G. *et al.* (2009) Genome-wide expression profiling of the osmoadaptation response of *Debaryomyces hansenii*. *Yeast (Chichester, England)*, **26**, 111–124.
- Gonzalez-Hernandez, J.C., Cardenas-Monroy, C.A., and Pena, A. (2004) Sodium and potassium transport in the halophilic yeast *Debaryomyces hansenii*. *Yeast (Chichester, England)*, **21**, 403–412.
- Gonzalez-Hernandez, J.C., Jimenez-Estrada, M., and Pena, A. (2005) Comparative analysis of trehalose production by *Debaryomyces hansenii* and *Saccharomyces cerevisiae* under saline stress. *Extremophiles: Life Under Extreme Conditions*, **9**, 7–16.
- Goodman, H.M., Olson, M.V., and Hall, B.D. (1977) Nucleotide sequence of a mutant eukaryotic gene: the yeast tyrosine-inserting ochre suppressor SUP4-o. *Proceedings of the National Academy of Sciences of the United States of America*, **74**, 5453–5457.
- Goodwin, T.J. and Poulter, R.T. (2000) Multiple LTR-retrotransposon families in the asexual yeast *Candida albicans*. *Genome Research*, **10**, 174–191.
- Goodwin, T.J., Ormandy, J.E., and Poulter, R.T. (2001) L1-like non-LTR retrotransposons in the yeast *Candida albicans*. *Current Genetics*, **39**, 83–91.
- Goodwin, T.J., Busby, J.N., and Poulter, R.T. (2007) A yeast model for target-primed (non-LTR) retrotransposition. *BMC Genomics*, **8**, 263.
- Gorbalenya, A.E. and Koonin, E.V. (1993) Helicases: amino acid sequence comparisons and structure–function relationships. *Current Opinion in Structural Biology*, **3**, 419–429.
- Gordon, J.L. and Wolfe, K.H. (2008) Recent allopolyploid origin of *Zygosaccharomyces rouxii* strain ATCC 42981. *Yeast (Chichester, England)*, **25**, 449–456.
- Gordon, J.L., Byrne, K.P., and Wolfe, K.H. (2009) Additions, losses, and rearrangements on the evolutionary route from a reconstructed ancestor to the modern *Saccharomyces cerevisiae* genome. *PLoS Genetics*, **5**, e1000485.
- Gori, K., Mortensen, H.D., Arneborg, N., and Jespersen, L. (2005) Expression of the GPD1 and GPP2 orthologues and glycerol retention during growth of *Debaryomyces hansenii* at high NaCl concentrations. *Yeast (Chichester, England)*, **22**, 1213–1222.
- Gotner, W., Durchschlag, E., Martinez-Pastor, M.T. *et al.* (1998) Nuclear localization of the C2H2 zinc finger protein Msn2p is regulated by stress and protein kinase A activity. *Genes and Development*, **12**, 586–597.
- Gotta, M. and Gasser, S.M. (1996) Nuclear organization and transcriptional silencing in yeast. *Experientia*, **52**, 1136–1147 (review).
- Gotte, M., Lazar, T., Yoo, J.S., Scheglmann, D., and Gallwitz, D. (2000) The full complement of yeast Ypt/Rab-GTPases and their involvement in exo- and endocytic trafficking. *Sub-Cellular Biochemistry*, **34**, 133–173 (review).
- Goud, B., Salminen, A., Walworth, N.C., and Novick, P.J. (1988) A GTP-binding protein required for secretion rapidly associates with secretory vesicles and the plasma membrane in yeast. *Cell*, **53**, 753–768.
- Goudot, C., Etchebest, C., Devaux, F., and Lelandais, G. (2011) The reconstruction of condition-specific transcriptional modules provides new insights in the evolution of yeast AP-1 proteins. *PLoS One*, **6**, e20924.
- Goujon, P. (2001) *From Biotechnology to Genomes – The Meaning of the Double Helix*, World Scientific, Singapore.
- Gould, K.L. and Nurse, P. (1989) Tyrosine phosphorylation of the fission yeast CDC2⁺ protein kinase regulates entry into mitosis. *Nature*, **342**, 39–45.
- Gould, S.J. and Subramani, S. (1988) Firefly luciferase as a tool in molecular and cell biology. *Analytical Biochemistry*, **175**, 5–13.
- Gould, S.J., McCollum, D., Spong, A.P., Heyman, J.A., and Subramani, S. (1992) Development of the yeast *Pichia pastoris* as a model organism for a genetic and molecular analysis of peroxisome assembly. *Yeast (Chichester, England)*, **8**, 613–628.
- Govin, J. and Berger, S.L. (2009) Genome reprogramming during sporulation. *The International Journal of Developmental Biology*, **53**, 425–432.
- Govind, C.K., Zhang, F., Qiu, H., Hofmeyer, K. and Hinnebusch, A.G. (2007) Gcn5 promotes acetylation, eviction, and methylation of nucleosomes in transcribed coding regions. *Molecular Cell*, **25**, 31–42.
- Goyal, K. and Mande, S.C. (2008) Exploiting 3D structural templates for detection of metal-binding sites in protein structures. *Proteins*, **70**, 1206–1218.
- Gozalbo, D., Elorza, M.V., Sanjuan, R., Marcilla, A., Valentin, E., and Sentandreu, R. (1993) Critical steps in fungal cell wall synthesis: strategies for their inhibition. *Pharmacology & Therapeutics*, **60**, 337–345 (review).
- Grably, M.R., Stanhill, A., Tell, O., and Engelberg, D. (2002) HSF and Msn2/4p can exclusively or cooperatively activate the yeast HSP104 gene. *Molecular Microbiology*, **44**, 21–35.
- Grabowski, P.J., Padgett, R.A., and Sharp, P.A. (1984) Lariat RNAs as intermediates and products in the splicing of messenger RNA precursors. *Cell*, **37**, 415–427.
- Grabowski, P.J., Seiler, S.R., and Sharp, P.A. (1985) A multicomponent complex is involved in the splicing of messenger RNA precursors. *Cell*, **42**, 345–353.
- Gradolatto, A., Rogers, R.S., Lavender, H. *et al.* (2008) *Saccharomyces cerevisiae* Yta7 regulates histone gene expression. *Genetics*, **179**, 291–304.
- Graf, A., Gasser, B., Dragosits, M. *et al.* (2008) Novel insights into the unfolded protein response using *Pichia pastoris* specific DNA microarrays. *BMC Genomics*, **9**, 390.
- Graham, L.A., Flannery, A.R., and Stevens, T.H. (2003) Structure and assembly of the yeast

- V-ATPase. *Journal of Bioenergetics and Biomembranes*, **35**, 301–312 (review).
- Grainger, R.J. and Beggs, J.D. (2005) Prp8 protein: at the heart of the spliceosome. *RNA*, **11**, 533–557.
- Grandi, P., Rybin, V., Bassler, J. *et al.* (2002) 90S pre-ribosomes include the 35S pre-rRNA, the U3 snoRNP and 40S subunit processing factors but predominantly lack 60S synthesis factors. *Molecular Cell*, **10**, 105–115.
- Granneman, S. and Baserga, S.J. (2004) Ribosome biogenesis: of knobs and RNA processing. *Experimental Cell Research*, **296**, 43–50.
- Granneman, S., Petfalski, E., Swiatkowska, A., and Tollervey, D. (2010) Cracking pre-40S ribosomal subunit structure by systematic analyses of RNA–protein cross-linking. *The EMBO Journal*, **29**, 2026–2036.
- Grant, P.A., Berger, S.L., and Workman, J.L. (1999) Identification and analysis of native nucleosomal histone acetyltransferase complexes. *Methods in Molecular Biology (Clifton, NJ)*, **119**, 311–317 (review).
- Grant, P.A., Berger, S.L., and Workman, J.L. (1999) Identification and analysis of native nucleosomal histone acetyltransferase complexes. *Methods Mol. Biol.*, **119**, 311–317 (review).
- Gratzer, S., Lithgow, T., Bauer, R.E. *et al.* (1995) Mas37p, a novel receptor subunit for protein import into mitochondria. *The Journal of Cell Biology*, **129**, 25–34.
- Grava, S., Keller, M., Voegeli, S., Seger, S., Lang, C., and Philippsen, P. (2011) Clustering of nuclei in multinucleated hyphae is prevented by dynein-driven bidirectional nuclear movements and microtubule growth control in *Ashbya gossypii*. *Eukaryotic Cell*, **10**, 902–915.
- Gray, J.V., Ogas, J.P., Kamada, Y., Stone, M., Levin, D.E., and Herskowitz, I. (1997) A role for the Pkc1 MAP kinase pathway of *Saccharomyces cerevisiae* in bud emergence and identification of a putative upstream regulator. *The EMBO Journal*, **16**, 4924–4937.
- Green, D.E. and Tzagoloff, A. (1966) The mitochondrial electron transfer chain. *Archives of Biochemistry and Biophysics*, **116**, 293–304.
- Green, R., Lesage, G., Sdicu, A.M., Ménard, P., and Bussey, H. (2003) A synthetic analysis of the *Saccharomyces cerevisiae* stress sensor Mid2p, and identification of a Mid2p-interacting protein, Zeo1p, that modulates the PKC1–MPK1 cell integrity pathway. *Microbiology (Reading, England)*, **149**, 2487–2499.
- Greenblatt, J. (1997) RNA polymerase II holoenzyme and transcriptional regulation. *Current Opinion in Cell Biology*, **9**, 310–319 (review).
- Greenwell, P.W., Kronmal, S.L., Porter, S.E., Gassenhuber, J., Obermaier, B., and Petes, T. D. (1995) TEL1, a gene involved in controlling telomere length in *S. cerevisiae*, is homologous to the human ataxia telangiectasia gene. *Cell*, **82**, 823–829.
- Gregg, C., Kyryakov, P., and Titorenko, V.I. (2009) Purification of mitochondria from yeast cells. *Journal of Visualized Experiments*, **30**, pii:1417.
- Gregory, P.D. and Hörz, W. (1998) Chromatin and transcription – how transcription factors battle with a repressive chromatin environment. *European Journal of Biochemistry*, **251**, 9–18 (review).
- Gregory, P.D. and Hörz, W. (1998) Life with nucleosomes: chromatin remodelling in gene regulation. *Current Opinion in Cell Biology*, **10**, 339–345 (review).
- Gregory, P.D., Barbaric, S., and Hörz, W. (1998) Analyzing chromatin structure and transcription factor binding in yeast. *Methods (San Diego, Calif.)*, **15**, 295–302 (review).
- Gregory, P.D., Wagner, K., and Hörz, W. (2001) Histone acetylation and chromatin remodeling. *Experimental Cell Research*, **265**, 195–202.
- Greig, D., Louis, E.J., Borts, R.H., and Travisano, M. (2002) Hybrid speciation in experimental populations of yeast. *Science*, **298**, 1773–1775.
- Gresham, D., Ruderfer, D.M., Pratt, S.C. *et al.* (2006) Genome-wide detection of polymorphisms at nucleotide resolution with a single DNA microarray. *Science*, **311**, 1932–1936.
- Gresham, D., Desai, M.M., Tucker, C.M. *et al.* (2008) The repertoire and dynamics of evolutionary adaptations to controlled nutrient-limited environments in yeast. *PLoS Genetics*, **4**, e1000303.
- Grether, M.E. and Herskowitz, I. (1999) Genetic and biochemical characterization of the yeast spo12 protein. *Molecular Biology of the Cell*, **10**, 3689–3703.
- Grewal, S.I. and Rice, J.C. (2004) Regulation of heterochromatin by histone methylation and small RNAs. *Current Opinion in Cell Biology*, **16**, 230–238.
- Gribun, A., Cheung, K.L., Huen, J., Ortega, J., and Houry, W.A. (2008) Yeast Rvb1 and Rvb2 are ATP-dependent DNA helicases that form a heterohexameric complex. *Journal of Molecular Biology*, **376**, 1320–1333.
- Griff, I.C., Schekman, R., Rothman, J.E., and Kaiser, C.A. (1992) The yeast *SEC17* gene product is functionally equivalent to mammalian alpha-SNAP protein. *The Journal of Biological Chemistry*, **267**, 12106–12115.
- Griffioen, G., Swinnen, S., and Thevelein, J.M. (2003) Feedback inhibition on cell wall integrity signaling by Zds1 involves Gsk3 phosphorylation of a cAMP-dependent protein kinase regulatory subunit. *The Journal of Biological Chemistry*, **278**, 23460–23471.
- Grishin, A.V., Rothenberg, M., Downs, M.A., and Blumer, K.J. (1998) Mot3, a Zn finger transcription factor that modulates gene expression and attenuates mating pheromone signaling in *Saccharomyces cerevisiae*. *Genetics*, **149**, 879–892.
- Grivell, L.A., Netter, P., Borst, P., and Slonimski, P.P. (1973) Mitochondrial antibiotic resistance in yeast: ribosomal mutants resistant to chloramphenicol, erythromycin and spiramycin. *Biochimica et Biophysica Acta*, **312**, 358–367.
- Görlich, D. and Mattaj, I.W. (1996) Nucleocytoplasmic transport. *Science*, **271**, 1513–1518 (review).
- Görlich, D. (1997) Nuclear protein import. *Current Opinion in Cell Biology*, **9**, 412–419 (review).
- Groll, M., Ditzel, L., Lowe, J. *et al.* (1997) Structure of 20S proteasome from yeast at 2.4 Å resolution. *Nature*, **386**, 463–471.
- Grosjean, H., Edqvist, J., Straby, K.B., and Giege, R. (1996) Enzymatic formation of modified nucleosides in tRNA: dependence on tRNA architecture. *Journal of Molecular Biology*, **255**, 67–85.
- Grosjean, H., de Crécy-Lagard, V., and Marck, C. (2010) Deciphering synonymous codons in the three domains of life: co-evolution with specific tRNA modification enzymes. *FEBS Letters*, **584**, 252–264.
- Grosshans, H., Simos, G., and Hurt, E. (2000) Transport of tRNA out of the nucleus – direct channeling to the ribosome? *Journal of Structural Biology*, **129**, 288–294 (review).
- Grosshans, B.L., Ortiz, D., and Novick, P. (2006) Rabs and their effectors: achieving specificity in membrane traffic. *Proceedings of the National Academy of Sciences of the United States of America*, **103**, 11821–11827.
- Gruber, S., Haering, C.H., and Nasmyth, K. (2003) Chromosomal cohesin forms a ring. *Cell*, **112**, 765–777.
- Gruber, S., Arumugam, P., Katou, Y. *et al.* (2006) Evidence that loading of cohesin onto chromosomes involves opening of its SMC hinge. *Cell*, **127**, 523–537.
- Grunstein, M. and Hogness, D.S. (1975) Colony hybridization: a method for the isolation of cloned DNAs that contain a specific gene. *Proceedings of the National Academy of Sciences of the United States of America*, **72**, 3961–3965.
- Grunstein, M., Hecht, A., Fisher-Adams, G. *et al.* (1995) The regulation of euchromatin and heterochromatin by histones in yeast. *Journal of Cell Science. Supplement*, **19**, 29–36 (review).
- Grunstein, M. (1990a) Histone function in transcription. *Annual Review of Cell Biology*, **6**, 643–678 (review).
- Grunstein, M. (1990b) Nucleosomes: regulators of transcription. *Trends in Genetics*, **6**, 395–400 (review).
- Grunstein, M. (1997) Molecular model for telomeric heterochromatin in yeast. *Current Opinion in Cell Biology*, **9**, 383–387 (review).
- Grunstein, M. (1998) Yeast heterochromatin: regulation of its assembly and inheritance by histones. *Cell*, **93**, 325–328 (review).
- Gu, X., Zhang, Z., and Huang, W. (2005) Rapid evolution of expression and regulatory divergences after yeast gene duplication. *Proceedings of the National Academy of Sciences of the United States of America*, **102**, 707–712.
- Gu, Z., Jiang, Q., and Yan, Z. (2007) RGS4 modulates serotonin signaling in prefrontal cortex and links to serotonin dysfunction in a rat model of schizophrenia. *Molecular Pharmacology*, **71**, 1030–1039.
- Guacci, V., Koshland, D., and Strunnikov, A. (1997) A direct link between sister chromatid cohesion and chromosome condensation revealed through the analysis of MCD1 in *S. cerevisiae*. *Cell*, **91**, 47–57.
- Guanter, R. and Poyatos, J.F. (2006) Dynamical principles of two-component genetic oscillators. *PLoS Computational Biology*, **2**, e30.
- Guarente, L. and Mason, T. (1983) Heme regulates transcription of the *CYC1* gene of *S. cerevisiae* via an upstream activation site. *Cell*, **32**, 1279–1286.
- Guarente, L. (1983) Yeast promoters and *lacZ* fusions designed to study expression of

- cloned genes in yeast. *Methods in Enzymology*, **101**, 181–191.
- Guarente, L. (1987) Regulatory proteins in yeast. *Annual Review of Genetics*, **21**, 425–452.
- Guarente, L. (1997) Chromatin and ageing in yeast and in mammals. *Ciba Foundation Symposium*, **211**, 104–107, discussion 107–111 (review).
- Guarente, L. (1999) Diverse and dynamic functions of the Sir silencing complex. *Nature Genetics*, **23**, 281–285 (review).
- Gudenus, R., Mariotte, S., Moenne, A. et al. (1988) Conditional mutants of RPC160, the gene encoding the largest subunit of RNA polymerase C in *Saccharomyces cerevisiae*. *Genetics*, **119**, 517–526.
- Guelin, E., Rep, M., and Grivell, L.A. (1994) Sequence of the *AFG3* gene encoding a new member of the FtsH/Yme1/Tma subfamily of the AAA-protein family. *Yeast (Chichester, England)*, **10**, 1389–1394.
- Guelin, E., Rep, M., and Grivell, L.A. (1996) Afg3p, a mitochondrial ATP-dependent metalloprotease, is involved in the degradation of mitochondrially-encoded Cox1, Cox3, Cob, Su6, Su8 and Su9 subunits of the inner membrane complexes III, IV and V. *FEBS Letters*, **381**, 42–46.
- Guelman, S., Kozuka, K., Mao, Y. et al. (2009) The double-histone-acetyltransferase complex ATAC is essential for mammalian development. *Molecular and Cellular Biology*, **29**, 1176–1188.
- Guilliermond, A. (1920) *The Yeasts*, John Wiley & Sons, Inc., New York.
- Guldener, U., Munsterkotter, M., Kastenmuller, G. et al. (2005) CYGD: the comprehensive yeast genome database. *Nucleic Acids Research*, **33** (Database Issue), D364–D368.
- Gunge, N. and Sakaguchi, K. (1981) Intergenic transfer of deoxyribonucleic acid killer plasmids, pGK1 and pGK2, from *Kluyveromyces lactis* into *Saccharomyces cerevisiae* by cell fusion. *Journal of Bacteriology*, **147**, 155–160.
- Gunge, N., Tamaru, A., Ozawa, F., and Sakaguchi, K. (1981) Isolation and characterization of linear deoxyribonucleic acid plasmids from *Kluyveromyces lactis* and the plasmid-associated killer character. *Journal of Bacteriology*, **145**, 382–390.
- Gunge, N., Fukuda, K., Morikawa, S., Murakami, K., Takeda, M., and Miwa, A. (1993) Osmophilic linear plasmids from the salt-tolerant yeast *Debaryomyces hansenii*. *Current Genetics*, **23**, 443–449.
- Gunisova, S., Elboher, E., Nosek, J., Gorkovoy, V., Brown, Y., Lucier, J.F., Laterreur, N., Wellinger, R.J., Tzfati, Y., Tomaska, L. (2009) Identification and comparative analysis of telomerase RNAs from *Candida* species reveal conservation of functional elements. *RNA*, **15**, 546–559.
- Gunther, M.R., Vangilder, R., Fang, J., and Beattie, D.S. (2004) Expression of a familial amyotrophic lateral sclerosis-associated mutant human superoxide dismutase in yeast leads to decreased mitochondrial electron transport. *Archives of Biochemistry and Biophysics*, **431**, 207–214.
- Guo, W. and Novick, P. (2004) The exocyst meets the translocon: a regulatory circuit for secretion and protein synthesis? *Trends in Cell Biology*, **14**, 61–63 (review).
- Guo, W., Roth, D., Walch-Solimena, C., and Novick, P. (1999) The exocyst is an effector for Sec4p, targeting secretory vesicles to sites of exocytosis. *The EMBO Journal*, **18**, 1071–1080.
- Guo, B., Styles, C.A., Feng, Q., and Fink, G.R. (2000) A *Saccharomyces* gene family involved in invasive growth, cell–cell adhesion, and mating. *Proceedings of the National Academy of Sciences of the United States of America*, **97**, 12158–12163.
- Gustilo, E.M., Vendeix, F.A., and Agris, P.F. (2008) tRNA's modifications bring order to gene expression. *Current Opinion in Microbiology*, **11**, 134–140.
- Gustin, M.C., Albertyn, J., Alexander, M., and Davenport, K. (1998) MAP kinase pathways in the yeast *S. cerevisiae*. *Microbiology and Molecular Biology Reviews*, **62**, 1264–1300.
- Guthrie, C. and Abelson, J. (1982) *Organization and Expression of tRNA Genes in Saccharomyces cerevisiae*. Cold Spring Harbor Press, Cold Spring Harb., N. Y.
- Guthrie, C. and Fink, G. (eds) (1991) *Guide to Yeast Genetics and Molecular Biology*, Academic Press, San Diego, CA.
- Guthrie, C. and Patterson, B. (1988) Spliceosomal snRNAs. *Annual Review of Genetics*, **22**, 387–419.
- Guthrie, C. (1991) Messenger RNA splicing in yeast: clues to why the spliceosome is a ribonucleoprotein. *Science*, **253**, 157–163.
- Guttmann-Raviv, N., Martin, S., and Kassir, Y. (2002) Ime2, a meiosis-specific kinase in yeast, is required for destabilization of its transcriptional activator, Ime1. *Molecular and Cellular Biology*, **22**, 2047–2056.
- Gygi, S.P., Rist, B., Gerber, S.A., Turecek, F., Gelb, M.H., and Aebersold, R. (1999) Quantitative analysis of complex protein mixtures using isotope-coded affinity tags. *Nature Biotechnology*, **17**, 994–999.
- Haarer, B.K., Petzold, A., Lillie, S.H., and Brown, S.S. (1994) Identification of MYO4, a second class V myosin gene in yeast. *Journal of Cell Science*, **107**, 1055–1064.
- Haas, A.L. and Rose, J.A. (1982) The mechanism of ubiquitin activating enzyme. A kinetic and equilibrium analysis. *The Journal of Biological Chemistry*, **257**, 10329–10337.
- Habib, S.J., Waizenegger, T., Niewianda, A., Paschen, S.A., Neupert, W., and Rapaport, D. (2007) The N-terminal domain of Tob55 has a receptor-like function in the biogenesis of mitochondrial β -barrel proteins. *The Journal of Cell Biology*, **176**, 77–88.
- Hackel, B.J., Huang, D., Bubolz, J.C., Wang, X. X., and Shusta, E.V. (2006) Production of soluble and active transferrin receptor-targeting single-chain antibody using *Saccharomyces cerevisiae*. *Pharmaceutical Research*, **23**, 790–797.
- Haddouche, R., Delessert, S., Sabirova, J., Neuveglise, C., Poirier, Y., and Nicaud, J.M. (2010) Roles of multiple acyl-CoA oxidases in the routing of carbon flow towards beta-oxidation and polyhydroxyalkanoate biosynthesis in *Yarrowia lipolytica*. *FEMS Yeast Research*, **10**, 917–927.
- Hadfield, C., Raina, K.K., Shashi-Menon, K., and Mount, R.C. (1993) The expression and performance of cloned genes in yeast. *Mycological Research*, **97**, 897–944.
- Hadfield, C. (1994) Construction of cloning and expression vectors, in *Molecular Genetics of Yeast: A Practical Approach* (ed. J.R. Johnston), Oxford University Press, New York, pp. 17–46.
- Haering, C.H., Lowe, J., Hochwagen, A., and Nasmyth, K. (2002) Molecular architecture of SMC proteins and the yeast cohesin complex. *Molecular Cell*, **9**, 773–788.
- Haeusler, R.A., Pratt-Hyatt, M., Good, P.D., Gipson, T.A., and Engelke, D.R. (2008) Clustering of yeast tRNA genes is mediated by specific association of condensin with tRNA gene transcription complexes. *Genes and Development*, **22**, 2204–2214.
- Hahn, J.S. and Thiele, D.J. (2002) Regulation of the *Saccharomyces cerevisiae* Slt2 kinase pathway by the stress-inducible Sdp1 dual specificity phosphatase. *The Journal of Biological Chemistry*, **277**, 21278–21284.
- Hahn, S., Buratowski, S., Sharp, P.A., and Guarente, L. (1989) Isolation of the gene encoding the yeast TATA binding protein TFIID: a gene identical to the SPT15 suppressor of Ty element insertions. *Cell*, **58**, 1173–1181.
- Hahn, J.S., Neef, D.W., and Thiele, D.J. (2006) A stress regulatory network for co-ordinated activation of proteasome expression mediated by yeast heat shock transcription factor. *Molecular Microbiology*, **60**, 240–251.
- Hahn-Hagerdal, B., Karhumaa, K., Fonseca, C., Spencer-Martins, I., and Gorwa-Grauslund, M.F. (2007) Towards industrial pentose-fermenting yeast strains. *Applied Microbiology and Biotechnology*, **74**, 937–953.
- Haid, A., Schweyen, R.J., Bechmann, H., Kaudewitz, F., Solioz, M., and Schatz, G. (1979) The mitochondrial COB region in yeast codes for apocytochrome *b* and is mosaic. *European Journal of Biochemistry*, **94**, 451–464.
- Hall, C. and Dietrich, F.S. (2007) The reacquisition of biotin prototrophy in *Saccharomyces cerevisiae* involved horizontal gene transfer, gene duplication and gene clustering. *Genetics*, **177**, 2293–2307.
- Hall, M.C. and Matson, S.W. (1999) Helicase motifs: the engine that powers DNA unwinding. *Molecular Microbiology*, **34**, 867–877.
- Hall, D.A., Zhu, H., Zhu, X., Royce, T., Gerstein, M., and Snyder, M. (2004) Regulation of gene expression by a metabolic enzyme. *Science*, **306**, 482–451.
- Hall, C., Brachat, S., and Dietrich, F.S. (2005) Contribution of horizontal gene transfer to the evolution of *Saccharomyces cerevisiae*. *Eukaryotic Cell*, **4**, 1102–1115.
- Halme, A., Michelitch, M., Mitchell, E.L., and Chant, J. (1996) Bud10p directs axial cell polarization in budding yeast and resembles a transmembrane receptor. *Current Biology*, **6**, 570–579.
- Hamilton, S.R. and Gerngross, T.U. (2007) Glycosylation engineering in yeast: the advent of fully humanized yeast. *Current Opinion in Biotechnology*, **18**, 387–392.
- Hammond, J.R. (1995) Genetically-modified brewing yeasts for the 21st century. *Progress to date Yeast*, **11**, 1613–1627 (review).
- Hamosh, A., Scott, A., Amberger, J., Bocchini, C., and McKusick, V. (2004) Online Mendelian Inheritance in Man (OMIM), a

- knowledgebase of human genes and genetic disorders. *Nucleic Acids Research*, **33** (Database Issue), D514–D517.
- Hampsey, M. (1998) Molecular genetics of the RNA polymerase II general transcriptional machinery. *Microbiology and Molecular Biology Reviews*, **62**, 465–503 (review).
- Hampton, R.Y. (2002) ER-associated degradation in protein quality control and cellular regulation. *Current Opinion in Cell Biology*, **14**, 476–482 (review).
- Han, J., Zhou, H., Horazdovsky, B., Zhang, K., Xu, R.M., and Zhang, Z. (2007) Rtt109 acetylates histone H3 lysine 56 and functions in DNA replication. *Science*, **315**, 653–655.
- Han, J., Zhou, H., Li, Z., Xu, R.M., and Zhang, Z. (2007) Acetylation of lysine 56 of histone H3 catalyzed by Rtt109 and regulated by ASF1 is required for replisome integrity. *The Journal of Biological Chemistry*, **282**, 28587–28596.
- Han, J., Li, Q., McCullough, L., Kettelkamp, C., Formosa, T., and Zhang, Z. (2010) Ubiquitylation of FACT by the cullin-E3 ligase Rtt101 connects FACT to DNA replication. *Genes and Development*, **24**, 1485–1490.
- Hanada, T., Noda, N.N., Satomi, Y. *et al.* (2007) The Atg12–Atg5 conjugate has a novel E3-like activity for protein lipidation in autophagy. *The Journal of Biological Chemistry*, **282**, 37298–37302.
- Hani, J. and Feldmann, H. (1998) tRNA genes and retroelements in the yeast genome. *Nucleic Acids Research*, **26**, 689–696.
- Hanlon, S.E. and Lieb, J.D. (2004) Progress and challenges in profiling the dynamics of chromatin and transcription factor binding with DNA microarrays. *Current Opinion in Genetics & Development*, **14**, 697–705.
- Hanna, J. and Finley, D. (2007) A proteasome for all occasions. *FEBS Letters*, **581**, 2854–2861.
- Hanna, J.S., Kröll, E.S., Lundblad, V., and Spencer, F.A. (2001) *Saccharomyces cerevisiae* CTF18 and CTF4 are required for sister chromatid cohesion. *Molecular and Cellular Biology*, **21**, 3144–3158.
- Hannig, E.M. and Hinnebusch, A.G. (1988) Molecular analysis of GCN3, a translational activator of GCN4: evidence for posttranslational control of GCN3 regulatory function. *Molecular and Cellular Biology*, **8**, 4808–4820.
- Hansen, L.J., Chalker, D.L., and Sandmeyer, S.B. (1988) Ty3, a yeast retrotransposon associated with tRNA genes, has homology to animal retroviruses. *Molecular and Cellular Biology*, **8**, 5245–5256.
- Haracska, L., Torres-Ramos, C.A., Johnson, R.E., Prakash, S. and Prakash, L. (2004) Opposing effects of ubiquitin conjugation and SUMO modification of PCNA on replicational bypass of DNA lesions in *Saccharomyces cerevisiae*. *Molecular and Cellular Biology*, **24**, 4267–4274.
- Harbison, C.T., Gordon, D.B., Lee, T.I. *et al.* (2004) Transcriptional regulatory code of a eukaryotic genome. *Nature*, **431**, 99–104.
- Hardie, D.G., Carling, D., and Carlson, M. (1998) The AMP-activated Snf1 kinase subfamily – metaboloid sensors of the eukaryotic cell. *Annual Review of Biochemistry*, **67**, 821–855.
- Harding, T.M., Morano, K.A., Scott, S.V., and Klionsky, D.J. (1995) Isolation and characterization of yeast mutants in the cytoplasm to vacuole protein targeting pathway. *The Journal of Cell Biology*, **131**, 591–602.
- Harding, T.M., Hefner-Gravink, A., Thumm, M., and Klionsky, D.J. (1996) Genetic and phenotypic overlap between autophagy and the cytoplasm to vacuole protein targeting pathway. *The Journal of Biological Chemistry*, **271**, 17621–17624.
- Hardwick, K.G. (1998) The spindle checkpoint. *Trends in Genetics*, **14**, 1–4.
- Hardy, C.F., Sussel, L., and Shore, D. (1992) A RAP1-interacting protein involved in transcriptional silencing and telomere length regulation. *Genes and Development*, **6**, 801–814.
- Harismendy, O., Gendrel, C.G., Soularue, P. *et al.* (2003) Genome-wide location of yeast RNA polymerase III transcription machinery. *The EMBO Journal*, **22**, 4738–4747.
- Harreman, M., Taschner, M., Sigurdsson, S. *et al.* (2009) Distinct ubiquitin ligases act sequentially for RNA polymerase II polyubiquitylation. *Proceedings of the National Academy of Sciences of the United States of America*, **106**, 20705–20710.
- Harris, N., Bachler, M., Costa, V., Mollapour, M., Moradas-Ferreira, P., and Piper, P.W. (2005) Overexpressed Sod1p acts either to reduce or to increase the lifespans and stress resistance of yeast, depending on whether it is Cu²⁺-deficient or an active Cu,Zn-superoxide dismutase. *Aging Cell*, **4**, 41–52.
- Harrison, P., Kumar, A., Lan, N., Echols, N., Snyder, M., and Gerstein, M. (2002) A small reservoir of disabled ORFs in the yeast genome and its implications for the dynamics of proteome evolution. *Journal of Molecular Biology*, **316**, 409–419.
- Hart, P.E., Lodi, R., Rajagopalan, B. *et al.* (2005) Antioxidant treatment of patients with Friedreich ataxia: four-year follow-up. *Archives of Neurology*, **62**, 621–626.
- Hartl, F.U., Ostermann, J., Guiard, B., and Neupert, W. (1987) Successive translocation into and out of the mitochondrial matrix: targeting of proteins to the intermembrane space by a bipartite signal peptide. *Cell*, **51**, 1027–1037.
- Hartley, J.L. and Donelson, J.E. (1980) Nucleotide sequence of the yeast plasmid. *Nature*, **286**, 860–865.
- Hartman, J.L.4th, Garvik, B., and Hartwell, L. (2001) Principles for the buffering of genetic variation. *Science*, **291**, 1001–1004.
- Hartner, F.S. and Glieder, A. (2006) Regulation of methanol utilisation pathway genes in yeasts. *Microbial Cell Factories*, **5**, 39.
- Hartner, F.S., Ruth, C., Langenegger, D. *et al.* (2008) Promoter library designed for fine-tuned gene expression in *Pichia pastoris*. *Nucleic Acids Research*, **36**, e76.
- Hartwell, L.H. and McLaughlin, C.S. (1969) A mutant of yeast apparently defective in the initiation of protein synthesis. *Proceedings of the National Academy of Sciences of the United States of America*, **62**, 468–474.
- Hartwell, L. and Weinert, T. (1989) Checkpoints: controls that ensure the order of cell cycle events. *Science*, **246**, 629–634.
- Hartwell, L.H., Culotti, J., and Reid, B. (1970a) Genetic control of the cell-division cycle in yeast. I. Detection of mutants. *Proceedings of the National Academy of Sciences of the United States of America*, **66**, 352–329.
- Hartwell, L.H., Hutchison, H.T., Holland, T.M., and McLaughlin, C.S. (1970b) The effect of cycloheximide upon polyribosome stability in two yeast mutants defective respectively in the initiation of polypeptide chains and in messenger RNA synthesis. *Molecular & General Genetics*, **106**, 347–361.
- Hartwell, L.H., McLaughlin, C.S., and Warner, J.R. (1970c) Identification of ten genes that control ribosome formation in yeast. *Molecular & General Genetics*, **109**, 42–56.
- Hartwell, L.H., Culotti, J., Pringle, J.R., and Reid, B.J. (1974a) Genetic control of the cell division cycle in yeast. *Science*, **183**, 46–51.
- Hartwell, L.H., Mortimer, R.K., Culotti, J., and Culotti, M. (1974b) Genetic control of the cell division cycle in yeast. V. Genetic analysis of *cdc* mutants. *Genetics*, **74**, 267–286.
- Hartwell, L.H. (1967) Macromolecule synthesis in temperature-sensitive mutants of yeast. *Journal of Bacteriology*, **93**, 1662–1670.
- Hartwell, L.H. (1971a) Genetic control of the cell division cycle in yeast. IV. Genes controlling bud emergence and cytokinesis. *Experimental Cell Research*, **69**, 265–276.
- Hartwell, L.H. (1971b) Genetic control of the cell division cycle in yeast. II. Genes controlling DNA replication and its initiation. *Journal of Molecular Biology*, **59**, 183–194.
- Hartwell, L.H. (1973) Synchronization of haploid yeast cell cycles, a prelude to conjugation. *Experimental Cell Research*, **76**, 111–117.
- Hartwell, L.H. (1974) *Saccharomyces cerevisiae* cell cycle. *Bacteriological Reviews*, **38**, 164–198 (review).
- Hartwell, L. (1992) Bringing the basic scientist into human disease research. *Molecular Biology of the Cell*, **3**, 837–838.
- Hartwell, L.H. (2002) Yeast and cancer. Nobel Lecture. *Bioscience Reports*, **22**, 373–394, http://nobelprize.org/nobel_prizes/medicine/laureates/2001/hartwell-lecture.html.
- Hartzog, G.A., Wada, T., Handa, H., and Winston, F. (1998) Evidence that Spt4, Spt5, and Spt6 control transcription elongation by RNA polymerase II in *Saccharomyces cerevisiae*. *Genes and Development*, **12**, 357–369.
- Hase, T., Muller, U., Riezman, H., and Schatz, G. (1984) A 70-kd protein of the yeast mitochondrial outer membrane is targeted and anchored via its extreme amino terminus. *The EMBO Journal*, **3**, 3157–3164.
- Hashem, V.I., Pytlos, M.J., Klysik, E.A. *et al.* (2004) Chemotherapeutic deletion of CTG repeats in lymphoblast cells from DM1 patients. *Nucleic Acids Research*, **32**, 6334–6346.
- Haslbeck, M., Braun, N., Stromer, T. *et al.* (2004) Hsp42 is the general small heat shock protein in the cytosol of *Saccharomyces cerevisiae*. *The EMBO Journal*, **23**, 638–649.
- Hastings, P.J., Ira, G., and Lupski, J.R. (2009) A microhomology-mediated break-induced replication model for the origin of human copy number variation. *PLoS Genetics*, **5**, e1000327.
- Hasunuma, T., Sanda, T., Yamada, R., Yoshimura, K., Ishii, J., and Kondo, A. (2011) Metabolic pathway engineering based on

- metabolomics confers acetic and formic acid tolerance to a recombinant xylose-fermenting strain of *Saccharomyces cerevisiae*. *Microbial Cell Factories*, **10**, 2.
- Hauber, J., Nelböck-Hochstetter, P., and Feldmann, H. (1985) Nucleotide sequence and characteristics of a Ty element from yeast. *Nucleic Acids Research*, **13**, 2745–2758.
- Hauber, J., Nelböck, P., Pilz, U., and Feldmann, H. (1986) Enhancer-like stimulation of yeast tRNA gene expression by a defined region of the Ty element micro-injected into *Xenopus* oocytes. *Biological Chemistry Hoppe Seyler*, **367**, 141–146.
- Hauber, J., Stucka, R., Krieg, R., and Feldmann, H. (1988) Analysis of yeast chromosomal regions carrying members of the glutamate tRNA gene family: various transposable elements are associated with them. *Nucleic Acids Research*, **16**, 10623–10634.
- Haubruck, H., Disela, C., Wagner, P., and Gallwitz, D. (1987) The ras-related Ypt protein is an ubiquitous eukaryotic protein: isolation and sequence analysis of mouse cDNA clones highly homologous to the yeast YPT1 gene. *The EMBO Journal*, **6**, 4049–4053.
- Hauacke, V., Horst, M., Schatz, G., and Lithgow, T. (1996) The Mas20p and Mas70p subunits of the protein import receptor of yeast mitochondria interact via the tetratricopeptide repeat motif in Mas20p: evidence for a single hetero-oligomeric receptor. *The EMBO Journal*, **15**, 1231–1237.
- Haugen, A.C., Kelley, R., Collins, J.B. *et al.* (2004) Integrating phenotypic and expression profiles to map arsenic-response networks. *Genome Biology*, **5**, R95.
- Hausmann, C.D. and Ibbá, M. (2008) Aminoacyl-tRNA synthetase complexes: molecular multitasking revealed. *FEMS Microbiology Reviews*, **32**, 705–721. Review.
- Hausmann, A., Samans, B., Lill, R., and Mühlhoff, U. (2008) Cellular and mitochondrial remodeling upon defects in iron–sulfur protein biogenesis. *The Journal of Biological Chemistry*, **283**, 8318–8330.
- Hedges, S.B., Blair, J.E., Venturi, M.L., and Shoe, J.L. (2004) A molecular timescale of eukaryote evolution and the rise of complex multicellular life. *BMC Evolutionary Biology*, **4**, 2.
- Hedman, J.M., Eggleston, M.D., Attyde, A.L., and Marshall, P.A. (2007) Prevacuolar compartment morphology in *vps* mutants of *Saccharomyces cerevisiae*. *Cell Biology International*, **31**, 1237–1244.
- Heese-Peck, A., Pichler, H., Zanolari, B., Watanabe, R., Daum, G., and Riezman, H. (2002) Multiple functions of sterols in yeast endocytosis. *Molecular Biology of the Cell*, **13**, 2664–2680.
- Hegemann, J.H. and Fleig, U.N. (1993) The centromere of budding yeast. *Bioessays*, **15**, 451–460.
- Heiland, I. and Erdmann, R. (2005) Biogenesis of peroxisomes. Topogenesis of the peroxisomal membrane and matrix proteins. *FEBS Journal*, **272**, 2362–2372.
- Heim, R., Cubitt, A.B., and Tsien, R.Y. (1995) Improved green fluorescence. *Nature*, **373**, 663–664.
- Hein, C., Springael, J.Y., Volland, C., Haguenaer-Tsapis, R., and André, B. (1995) *NPI1*, an essential yeast gene involved in induced degradation of Gap1 and Fur4 permeases, encodes the Rsp5 ubiquitin–protein ligase. *Molecular Microbiology*, **18**, 77–87.
- Heinemann, M. and Panke, S. (2006) Synthetic biology – putting engineering into biology. *Bioinformatics (Oxford, England)*, **22**, 2790–2799.
- Heinemeyer, W., Kleinschmidt, J.A., Saidowsky, J., Escher, C., and Wolf, D.H. (1991) Proteinase yscE, the yeast proteasome/multicatalytic–multifunctional proteinase: mutants unravel its function in stress induced proteolysis and uncover its necessity for cell survival. *The EMBO Journal*, **10**, 555–562.
- Heinemeyer, W., Trondle, N., Albrecht, G., and Wolf, D.H. (1994) *PRE5* and *PRE6*, the last missing genes encoding 20S proteasome subunits from yeast? Indication for a set of 14 different subunits in the eukaryotic proteasome core. *Biochemistry*, **33**, 12229–12237.
- Heintz, N.H. and Stillman, B.W. (1989) Nuclear DNA synthesis *in vitro* is mediated by stable replication forks assembled in a temporally specific fashion *in vivo*. *Molecular and Cellular Biology*, **8**, 1923–1931.
- Heitman, M., Movva, N.R., and Hall, M.N. (1991) Targets for cell cycle arrest by the immunosuppressant rapamycin in yeast. *Science*, **253**, 905–909.
- Heitman, J., Kronstad, J., Taylor, J., and Casselton, L. (eds) (2007) *Sex in Fungi, Molecular Determination and Evolutionary Implications*, American Society for Microbiology, Washington, DC.
- Helenius, A. and Aebi, M. (2004) Roles of N-linked glycans in the endoplasmic reticulum. *Annual Review of Biochemistry*, **73**, 1019–1049.
- Hell, K., Neupert, W., and Stuart, R. (2001) Oxa1p acts as a general membrane insertion machinery for proteins encoded by mitochondrial DNA. *The EMBO Journal*, **20**, 1281–1288.
- Hellborg, L. and Piskur, J. (2009) Complex nature of the genome in a wine spoilage yeast, *Dekkera bruxellensis*. *Eukaryotic Cell*, **8**, 1739–1749.
- Hellborg, L., Woolfit, M., Arthursson-Hellborg, M., and Piskur, J. (2008) Complex evolution of the *DAL5* transporter family. *BMC Genomics*, **9**, 164.
- Helliwell, S.B., Wagner, P., Kunz, J., Deuter-Reinhard, M., Henriquez, R., and Hall, M.N. (1994) TOR1 and TOR2 are structurally and functionally similar but not identical phosphatidylinositol kinase homologues in yeast. *Molecular Biology of the Cell*, **5**, 105–108.
- Helmlinger, D., Hardy, S., Sasorith, S., Klein, F., Robert, F., Weber, C., Miguet, L., Potier, N., Van-Dorselaer, A., Wurtz, J.M., Mandel, J.L., Tora, L., and Devys, D. (2004) Ataxin-7 is a subunit of GCN5 histone acetyltransferase-containing complexes. *Human Molecular Genetics*, **13**, 1257–1265.
- Helser, T.L. and McLaughlin, C.S. (1975) Small ribonucleic acid molecules produced during ribosome biosynthesis in *Saccharomyces cerevisiae*. *The Journal of Biological Chemistry*, **250**, 2003–2007.
- Hengartner, C.J., Myer, V.E., Liao, S.M., Wilson, C.J., Koh, S.S., and Young, R.A. (1998) Temporal regulation of RNA polymerase II by Srb10 and Kin28 cyclin-dependent kinases. *Molecular Cell*, **2**, 43–53.
- Henras, A.K., Soudet, J., Gerus, M. *et al.* (2008) The post-transcriptional steps of eukaryotic ribosome biogenesis. *Cellular and Molecular Life Sciences*, **65**, 2334–2359.
- Henry, K.W., Wyce, A., Lo, W.S., Duggan, L.J., Emre, N.C., Kao, C.F., Pillus, L., Shilatfard, A., Osley, M.A., and Berger, S.L. (2003) Transcriptional activation via sequential histone H2B ubiquitylation and deubiquitylation, mediated by SAGA-associated Ubp8. *Genes and Development*, **17**, 2648–2663.
- Hensel, A., Gierzalski, W., and Erdmann, R. (2010) Proteinimport in die peroxisomale Matrix, ein Prozess nimmt Form an. *Biospektrum*, **16**, 395–397.
- Hensgens, L.A.M., Bonen, L., deHaan, M., van der Horts, G., and Grivell, L.A. (1983) Two intron sequences in yeast mitochondrial COX1 gene: homology among URF-containing introns and strain-dependent variation in flanking exons. *Cell*, **32**, 379–389.
- Hernandez, H., Dziembowski, A., Taverner, T., Seraphin, B., and Robinson, C.V. (2006) Subunit architecture of multimeric complexes isolated directly from cells. *EMBO Reports*, **7**, 605–610.
- Herbert, C.J., Labouesse, M., Dujardin, G., and Slonimski, P.P. (1988) The NAM2 proteins from *S. cerevisiae* and *S. douglasii* are mitochondrial leucyl-tRNA synthetases, and are involved in mRNA splicing. *The EMBO Journal*, **7**, 473–483.
- Hereford, L., Fahrner, K., Woolford, J.Jr, Rosbash, M., and Kaback, D.B. (1979) Isolation of yeast histone genes H2A and H2B. *Cell*, **18**, 1261–1271.
- Herlan, M., Vogel, F., Bornhove, C., Neupert, W., and Reichert, A.S. (2003) Processing of Mgm1 by the rhomboid-type protease Pcp1 is required for maintenance of mitochondrial morphology and of mitochondrial DNA. *The Journal of Biological Chemistry*, **278**, 27781–27788.
- Herman, A. and Roman, H. (1966) Allele specific determinants of homothallism in *Saccharomyces lactis*. *Genetics*, **53**, 727–740.
- Herold, A., Suyama, M., Rodrigues, J.P. *et al.* (2000) TAP (NXF1) belongs to a multigene family of putative RNA export factors with a conserved modular architecture. *Molecular and Cellular Biology*, **20**, 8996–9008.
- Herrmann, J.M. and Funes, S. (2005) Biogenesis of cytochrome oxidase – sophisticated assembly lines in the mitochondrial inner membrane. *Genetics*, **354**, 43–52.
- Herrmann, J.M. and Neupert, W. (2000) Protein transport into mitochondria. *Current Opinion in Microbiology*, **3**, 210–214 (review).
- Herrmann, J.M., Folsch, H., Neupert, W., and Stuart, R.H. (1994) Isolation of yeast mitochondria and study of mitochondrial protein translation, in *Cell Biology: A Laboratory Handbook* (ed. J.E. Celis), Academic Press, New York, pp. 538–544.
- Herrmann, J.M., Neupert, W., and Stuart, R.A. (1997) Insertion into the mitochondrial inner membrane of a polytopic protein, the nuclear-encoded Oxa1p. *The EMBO Journal*, **16**, 2217–2226.
- Hershko, A. and Ciechanover, A. (1998) The ubiquitin system. *Annual Review of Biochemistry*, **67**, 425–479.

- Hershko, A., Ciechanover, A., and Rose, I.A. (1979) Resolution of the ATP-dependent proteolytic system from reticulocytes: a component that interacts with ATP. *Proceedings of the National Academy of Sciences of the United States of America*, **76**, 3107–3110.
- Hershko, A., Ciechanover, A., Heller, H., Haas, A.L., and Rose, I.A. (1980) Proposed role of ATP in protein breakdown: conjugation of protein with multiple chains of the polypeptide of ATP-dependent proteolysis. *Proceedings of the National Academy of Sciences of the United States of America*, **77**, 1783–1786.
- Hershko, A., Ciechanover, A., and Rose, I.A. (1981) Identification of the active amino acid residue of the polypeptide of ATP-dependent protein breakdown. *The Journal of Biological Chemistry*, **256**, 1525–1528.
- Hershko, A., Heller, H., Elias, S., and Ciechanover, A. (1983) Components of ubiquitin–protein ligase system. Resolution, affinity purification, and role in protein breakdown. *The Journal of Biological Chemistry*, **258**, 8206–8214.
- Hershko, A., Heller, H., Eytan, E., Kaklij, G., and Rose, I.A. (1984) Role of the alpha-amino group of protein in ubiquitin-mediated protein breakdown. *Proceedings of the National Academy of Sciences of the United States of America*, **81**, 7021–7025.
- Hershko, A. (1988) Functional heterogeneity of ubiquitin carrier proteins. *The Journal of Biological Chemistry*, **260**, 1573–1581.
- Hershko, A. (2004) *The ubiquitin system for protein degradation and some of its roles in the control of the cell division cycle. Nobel Lecture*, http://nobelprize.org/nobel_prizes/chemistry/laureates/2004/hershko-lecture.html.
- Herskowitz, I. and Oshima, Y. (1981) Control of cell type in *Saccharomyces cerevisiae*: mating type and mating-type interconversion, in *The Molecular Biology of the Yeast Saccharomyces: Life Cycle and Inheritance* (eds J.N. Strathern, E.W. Jones, and J.R. Broach), Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, pp. 181–209.
- Herskowitz, I., Park, H.O., Sanders, S., Valtz, N., and Peter, M. (1995) Programming of cell polarity in budding yeast by endogenous and exogenous signals. *Cold Spring Harbor Symposia on Quantitative Biology*, **60**, 717–727 (review).
- Herskowitz, I. (1989) A regulatory hierarchy for cell specialization in yeast. *Nature*, **342**, 749–757.
- Herskowitz, I. (1997) Building organs and organisms: elements of morphogenesis exhibited by budding yeast. *Cold Spring Harbor Symposia on Quantitative Biology*, **62**, 57–63 (review).
- Hertel, C.B., Langst, G., Hörz, W., and Körber, P. (2005) Nucleosome stability at the yeast PHO5 and PHO8 promoters correlates with differential cofactor requirements for chromatin opening. *Molecular and Cellular Biology*, **25**, 10755–10767.
- Hettema, E.H. and Tabak, H.F. (2000) Transport of fatty acids and metabolites across the peroxisomal membrane. *Biochimica et Biophysica Acta*, **1486**, 18–27 (review).
- Hettema, E.H., vanRoermund, C.W.T., Distel, B. et al. (1996) The ABC transporter proteins Pat1 and Pat2 are required for import of long-chain fatty acids into peroxisomes of *Saccharomyces cerevisiae*. *The EMBO Journal*, **15**, 3813–3822.
- Hettema, E.H., Lewis, M.J., Black, M.W., and Pelham, H.R.B. (2003) Retromer and the sorting nexins Snx4/41/42 mediate distinct retrieval pathways from yeast endosomes. *The EMBO Journal*, **22**, 548–557.
- Hettema, E.H., Valdez-Taubas, J., and Pelham, H.R.B. (2004) Bsd2 binds the ubiquitin ligase Rsp5 and mediates the ubiquitination of transmembrane proteins. *The EMBO Journal*, **23**, 1279–1288.
- Heumann, K., Harris, C., and Mewes, H.W. (1996) A top-down approach to whole genome visualization. *International Conference on Intelligent Systems for Molecular Biology*, **4**, 98–108.
- Heus, J.J., Zonneveld, B.J., de Steensma, H.Y., and van den Berg, J.A. (1993) The consensus sequence of *Kluyveromyces lactis* centromeres shows homology to functional centromeric DNA from *Saccharomyces cerevisiae*. *Molecular & General Genetics*, **236**, 355–362.
- Heyman, T., Agoutin, B., Fix, C., Dirheimer, G., and Keith, G. (1994) Yeast serine isoacceptor tRNAs: variations of their content as a function of growth conditions and primary structure of the minor tRNA(Ser)GCU. *FEBS Letters*, **347**, 143–146.
- Heximer, S.P., Knutsen, R.H., Sun, X. et al. (2003) Hypertension and prolonged vasoconstrictor signaling in RGS2-deficient mice. *The Journal of Clinical Investigation*, **111**, 445–452.
- Hibbett, D.S., Binder, M., Bischoff, J.F. et al. (2007) A higher-level phylogenetic classification of the fungi. *Mycological Research*, **111**, 509–547.
- Hicke, L. and Dunn, R. (2003) Regulation of membrane protein transport by ubiquitin and ubiquitin-binding proteins. *Annual Review of Cell and Developmental Biology*, **19**, 141–172.
- Hicke, L. and Schekman, R. (1989) Yeast Sec23p acts in the cytoplasm to promote protein transport from the endoplasmic reticulum to the Golgi complex *in vivo* and *in vitro*. *The EMBO Journal*, **8**, 1677–1684.
- Hicke, L. and Schekman, R. (1990) Molecular machinery required for protein transport from the endoplasmic reticulum to the Golgi complex. *Bioessays*, **12**, 253–258 (review).
- Hicke, L., Yoshihisa, T., and Schekman, R. (1992) Sec23p and a novel 105-kDa protein function as a multimeric complex to promote vesicle budding and protein transport from the endoplasmic reticulum. *Molecular Biology of the Cell*, **3**, 667–676.
- Hicke, L., Zanolari, B., Pypaert, M., Rohrer, J., and Riezman, H. (1997) Transport through the yeast endocytic pathway occurs through morphologically distinct compartments and requires an active secretory pathway and Sec18p/N-ethylmaleimide-sensitive fusion protein. *Molecular Biology of the Cell*, **8**, 13–31.
- Hicke, L. (1997) Ubiquitin-dependent internalization and down-regulation of plasma membrane proteins. *The FASEB Journal*, **11**, 1215–1226 (review).
- Hicke, L. (1999) Gettin' down with ubiquitin: turning off cell-surface receptors, transporters and channels. *Trends in Cell Biology*, **9**, 107–112 (review).
- Hicke, L. (2001a) A new ticket for entry into budding vesicles – ubiquitin. *Cell*, **106**, 527–530.
- Hicke, L. (2001b) Protein regulation by monoubiquitin. *Nature Reviews Molecular Cell Biology*, **2**, 195–201 (review).
- Hickman, M.A. and Rusche, L.N. (2007) Substitution as a mechanism for genetic robustness. The duplicated deacetylases Hst1p and Sir2p in *Saccharomyces cerevisiae*. *PLoS Genetics*, **3**, 1325–1338.
- Hickman, M.A. and Rusche, L.N. (2009) The Sir2–sum1 complex represses transcription using both promoter-specific and long-range mechanisms to regulate cell identity and sexual cycle in the yeast *Kluyveromyces lactis*. *PLoS Genetics*, **5**, e1000710.
- Hickman, M.A. and Rusche, L.N. (2010) Transcriptional silencing functions of the yeast protein Orc1/Sir3 subfunctionalized after gene duplication. *Proceedings of the National Academy of Sciences of the United States of America*, **107**, 19384–19389.
- Hickman, M.A., Froyd, C.A., and Rusche, L.N. (2011) Reinventing heterochromatin in budding yeasts, Sir2 and the origin recognition complex take center stage. *Eukaryotic Cell*, **10**, 1183–1192.
- Hicks, J.B. and Herskowitz, I. (1976) Evidence for a new diffusible element of mating pheromones in yeast. *Nature*, **260**, 246–248.
- Hieter, P., Pridmore, D., Hegemann, J.H., Thomas, M., Davis, R.W., and Philippsen, P. (1985) Functional selection and analysis of yeast centromeric DNA. *Cell*, **42**, 913–921.
- Hikkel, I., Lucau-Danila, A., Delaveau, T., Marc, P., Devaux, F., and Jacq, C. (2003) A general strategy to uncover transcription factor properties identifies a new regulator of drug resistance in yeast. *The Journal of Biological Chemistry*, **278**, 11427–11432.
- Hiley, S.L., Jackman, J., Babak, T. et al. (2005) Detection and discovery of RNA modifications using microarrays. *Nucleic Acids Research*, **33**, e2.
- Hilleren, P., McCarthy, T., Rosbash, M., Parker, R., and Jensen, T.H. (2001) Quality control of mRNA 3'-end processing is linked to the nuclear exosome. *Nature*, **413**, 538–542.
- Hilt, W. and Wolf, D.H. (1995) Proteasomes of the yeast *S. cerevisiae*: genes, structure and functions. *Molecular Biology Reports*, **21**, 3–10 (review).
- Hilt, W. and Wolf, D.H. (1996) Proteasomes: destruction as a programme. *Trends in Biochemical Sciences*, **21**, 96–102 (review).
- Hilt, W., Heinemeyer, W., and Wolf, D.H. (1993) Studies on the yeast proteasome uncover its basic structural features and multiple *in vivo* functions. *Enzyme & Protein*, **47**, 189–201 (review).
- Hines, V. and Schatz, G. (1993) Precursor binding to yeast mitochondria. A general role for the outer membrane protein Mas70p. *The Journal of Biological Chemistry*, **268**, 449–454.
- Hinnebusch, A. and Liebman, S. (1991) *Protein Synthesis and Translational Control in Saccharomyces cerevisiae*. Cold Spring Harbor Press, Cold Spring Harb., N.Y.
- Hinnebusch, A.G. and Natarajan, K. (2002) Gcn4p, a master regulator of gene expression, is controlled at multiple levels by diverse signals of starvation and stress. *Eukaryotic Cell*, **1**, 22–32.

- Hinnebusch, A.G. (1984) Evidence for translational regulation of the activator of general amino acid control in yeast. *Proceedings of the National Academy of Sciences of the United States of America*, **81**, 6442–6446.
- Hinnebusch, A.G. (1985) A hierarchy of trans-acting factors modulates translation of an activator of amino acid biosynthetic genes in *Saccharomyces cerevisiae*. *Molecular and Cellular Biology*, **5**, 2349–2360.
- Hinnebusch, A.G. (1986) The general control of amino acid biosynthetic genes in the yeast *Saccharomyces cerevisiae*. *CRC Critical Reviews in Biochemistry*, **21**, 277–317 (review).
- Hinnebusch, A.G. (1988a) Novel mechanisms of gene regulation in the general control of amino acid biosynthesis in *Saccharomyces cerevisiae*. *Microbiological Reviews*, **52**, 248–273 (review).
- Hinnebusch, A.G. (1988b) Novel mechanisms of translational control in *Saccharomyces cerevisiae*. *Trends in Genetics*, **4**, 169–174 (review).
- Hinnebusch, A.G. (1993) Gene-specific translational control of the yeast GCN4 gene by phosphorylation of eukaryotic initiation factor 2. *Molecular Microbiology*, **10**, 215–223 (review).
- Hinnebusch, A.G. (1994) Translational regulation of yeast GCN4. A window on factors that control initiator-tRNA binding to the ribosome. *The Journal of Biological Chemistry*, **272**, 21661–21664 (review).
- Hinnen, A., Hicks, J.B., and Fink, G.R. (1978) Transformation of yeast. *Proceedings of the National Academy of Sciences of the United States of America*, **75**, 1929–1933.
- Hirakawa, K., Kobayashi, S., Inoue, T., Endoh-Yamagami, S., Fukuda, R., and Ohta, A. (2009) Yas3p, an opi1 family transcription factor, regulates cytochrome P450 expression in response to *n*-alkanes in *Yarrowia lipolytica*. *The Journal of Biological Chemistry*, **284**, 7126–7137.
- Hirano, T. (2000) Chromosome cohesion, condensation, and separation. *Annual Review of Biochemistry*, **69**, 115–144.
- Hirata, R., Ohsumk, Y., Nakano, A., Kawasaki, H., Suzuki, K., and Anraku, Y. (1990) Molecular structure of a gene, VMA1, encoding the catalytic subunit of H⁺-translocating adenosine triphosphatase from vacuolar membranes of *Saccharomyces cerevisiae*. *The Journal of Biological Chemistry*, **265**, 6726–6733.
- Hirata, D., Yano, K., and Miyakawa, T. (1994) Stress-induced transcriptional activation mediated by YAP1 and YAP2 genes that encode the Jun family of transcriptional activators in *Saccharomyces cerevisiae*. *Molecular & General Genetics*, **242**, 242–256.
- Hirose, Y. and Manley, J.L. (1998) RNA polymerase II is an essential mRNA polyadenylation factor. *Nature*, **395**, 93–96.
- Hisatomi, T., Yanagishima, N., Sakurai, A., and Kobayashi, H. (1988) Interspecific actions of alpha-mating pheromones on the a-mating-type cells of 3 *Saccharomyces* yeasts. *Current Genetics*, **13**, 25–27.
- Hishinuma, F. and Hirai, K. (1991) Genome organization of the linear plasmid, pSKL, isolated from *Saccharomyces kluyveri*. *Molecular and General Genetics*, **226**, 97–106.
- Hitchcock, A.L., Kribber, H., Fietze, S., Lin, A., Latterich, M., and Silver, P.A. (2001) The conserved Npl4 protein complex mediates proteasome-dependent membrane-bound transcription factor activation. *Molecular Biology of the Cell*, **12**, 3226–3241.
- Hitt, R. and Wolf, D.H. (2004) Der1p, a protein required for degradation of malformed soluble proteins of the endoplasmic reticulum: topology and Der1-like proteins. *FEMS Yeast Research*, **4**, 721–729.
- Hittinger, C.T., Rokas, A., and Carroll, S.B. (2004) Parallel inactivation of multiple GAL pathway genes and ecological diversification in yeasts. *Proceedings of the National Academy of Sciences of the United States of America*, **101**, 14144–14149.
- Hittinger, C.T., Gonçalves, P., Sampaio, J.P., Dover, J., Johnston, M., and Rokas, A. (2010) Remarkably ancient balanced polymorphisms in a multi-locus gene network. *Nature*, **464**, 54–58.
- Hitzeman, R.A., Hagie, F.E., Levine, H.L., Goeddel, D.V., Ammerer, G., and Hall, B.D. (1981) Expression of a human gene for interferon in yeast. *Nature*, **293**, 717–722.
- Ho, Y., Gruhler, A., Heilbut, A. et al. (2002) Systematic identification of protein complexes in *Saccharomyces cerevisiae* by mass spectrometry. *Nature*, **415**, 180–183.
- Ho, S.W., Jona, G., Chen, C.T., Johnston, M., and Snyder, M. (2006) Linking DNA-binding proteins to their recognition sequences by using protein microarrays. *Proceedings of the National Academy of Sciences of the United States of America*, **103**, 9940–9945.
- Hoagland, M.B., Zamecnik, P.C., and Stephenson, M.L. (1957) Intermediate reactions in protein biosynthesis. *Biochimica et Biophysica Acta*, **24**, 215–216.
- Hobot, J.A. and Jennings, D.H. (1981) Growth of *Debaryomyces hansenii* and *Saccharomyces cerevisiae* in relation to pH and salinity. *Experimental Mycology*, **5**, 217–228.
- Hochstrasser, M., Johnson, P.R., Arendt, C.S. et al. (1999) The *Saccharomyces cerevisiae* ubiquitin-proteasome system. *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences*, **354**, 1513–1522 (review).
- Hochstrasser, M. (2000) Evolution and function of ubiquitin-like protein-conjugation systems. *Nature Cell Biology*, **2**, E153–E157 (review); erratum in *Nature Cell Biology*, **2**, E206.
- Hochstrasser, M. (2001) SP-RING for SUMO: new functions bloom for a ubiquitin-like protein. *Cell*, **107**, 5–8.
- Hoeghe, C., Pfander, B., Moldovan, G.L., Pyrowolakis, G., and Jentsch, S. (2002) RAD6-dependent DNA repair is linked to modification of PCNA by ubiquitin and SUMO. *Nature*, **419**, 135–141.
- Hoelz, A. and Blobel, G. (2004) Cell biology: popping out of the nucleus. *Nature*, **432**, 815–816.
- Hofer, M. and Pospíšil, M. (2011) Modulation of animal and human hematopoiesis by β-glucans: a review. *Molecules*, **16**, 7969–7979.
- Hoffman, L., Pratt, G., and Rechsteiner, M. (1992) Multiple forms of the 20S multicatalytic and the 26S ubiquitin/ATP-dependent proteases from rabbit reticulocyte lysate. *The Journal of Biological Chemistry*, **267**, 22362–22368.
- Hoffmann, A., Sinn, E., Yamamoto, T. et al. (1990) Highly conserved core domain and unique N-terminus with presumptive regulatory motifs in a human TATA factor (TFIID). *Nature*, **346**, 387–390.
- Hoffmann, A., Chiang, C.M., Oelgeschlager, T. et al. (1996) A histone octamer-like structure within TFIID. *Nature*, **380**, 356–359.
- Hofmann, K. and Bucher, P. (1996) The UBA domain: a sequence motif present in multiple enzyme classes of the ubiquitination pathway. *Trends in Biochemical Sciences*, **21**, 172–173.
- Hofmann, K. and Falquet, L. (2001) A ubiquitin-interacting motif conserved in components of the proteasomal and lysosomal protein degradation systems. *Trends in Biochemical Sciences*, **26**, 347–350.
- Hogan, G.J., Lee, C.K., and Lieb, J.D. (2006) Cell cycle-specified fluctuation of nucleosome occupancy at gene promoters. *PLoS Genetics*, **2**, e158.
- Hogues, H., Lavoie, H., Sellam, A. et al. (2008) Transcription factor substitution during the evolution of fungal ribosome regulation. *Molecular Cell*, **29**, 552–562.
- Hohfeld, J., Veenhuis, M., and Kunau, W.H. (1991) PAS3, a *Saccharomyces cerevisiae* gene encoding a peroxisomal integral membrane protein essential for peroxisome biogenesis. *The Journal of Cell Biology*, **114**, 1167–1178.
- Hohmann, S. (2002) Osmotic stress signaling and osmoadaptation in yeasts. *Microbiology and Molecular Biology Reviews*, **66**, 300–372 (review).
- Hohn, B. and Collins, J. (1980) A small cosmid for efficient cloning of large DNA fragments. *Genetics*, **11**, 291–298.
- Hoi, J.W.S. and Dumas, B. (2010) Ste12 and Ste12-like proteins, fungal transcription factors regulating development and pathogenicity. *Eukaryotic Cell*, **9**, 480–485.
- Holland, M.J. and Holland, J.P. (1978) Isolation and identification of yeast messenger ribonucleic acids coding for enolase, glyceraldehyde-3-phosphate dehydrogenase, and phosphoglycerate kinase. *Biochemistry*, **17**, 4900–4907.
- Holland, M.J. and Holland, J.P. (1979) Isolation and characterization of a gene coding for glyceraldehyde-3-phosphate dehydrogenase from *Saccharomyces cerevisiae*. *The Journal of Biological Chemistry*, **254**, 5466–5474.
- Holland, J.P. and Holland, M.J. (1980) Structural comparison of two nontandemly repeated yeast glyceraldehyde-3-phosphate dehydrogenase genes. *The Journal of Biological Chemistry*, **255**, 2596–2605.
- Holland, M.J., Hager, G.L., and Rutter, W.J. (1977) Characterization of purified poly (adenylic acid)-containing messenger ribonucleic acid from *Saccharomyces cerevisiae*. *Biochemistry*, **16**, 8–16.
- Holland, M.J., Holland, J.P., and Jackson, K.A. (1979) Cloning of yeast genes coding for glycolytic enzymes. *Methods in Enzymology*, **68**, 408–419.
- Hollenberg, C.P., Kustermann-Kuhn, B., and Royer, H.D. (1976) Synthesis of high molecular weight polypeptides in *Escherichia coli* minicells directed by cloned *Saccharomyces cerevisiae* 2-micron DNA. *Genetics*, **1**, 33–47.
- Hollenberg, C.P. (1978) Mapping of regions on cloned *Saccharomyces cerevisiae* 2-μm DNA coding for polypeptides synthesized in

- Escherichia coli* minicells. *Molecular & General Genetics*, **162**, 23–34.
- Hollenberg, C.P. (1982) Cloning with 2-micrometer DNA vectors and the expression of foreign genes in *Saccharomyces cerevisiae*. *Current Topics in Microbiology and Immunology*, **96**, 119–144 (review).
- Hollenhorst, P.C., Pietz, G., and Fox, C.A. (2001) Mechanisms controlling differential promoter-occupancy by the yeast forkhead proteins Fkh1p and Fkh2p: implications for regulating the cell cycle and differentiation. *Genes and Development*, **15**, 2445–2456.
- Holley, R.W., Appgar, J., Everett, G.A. et al. (1965) Structure of a ribonucleic acid. *Science*, **147**, 1462–1465.
- Hollingsworth, N.M. (2008) Deconstructing meiosis one kinase at a time: polo pushes past pachytene. *Genes and Development*, **22**, 2596–2600.
- Holloway, S.L., Glotzer, M., King, R.W., and Murray, A.W. (1993) Anaphase is initiated by proteolysis rather than by the inactivation of maturation-promoting factor. *Cell*, **73**, 1393–1402.
- Holstege, F.C. and Young, R.A. (1999) Transcriptional regulation: contending with complexity. *Proceedings of the National Academy of Sciences of the United States of America*, **96**, 2–4.
- Holstege, F.C., Jennings, E.G., Wyrick, J.J. et al. (1998) Dissecting the regulatory circuitry of a eukaryotic genome. *Cell*, **95**, 717–728.
- Holthuis, J.C., Nichols, B.J., Dhruvakumar, S., and Pelham, H.R. (1998) Two syntaxin homologues in the TGN/endosomal system of yeast. *The EMBO Journal*, **17**, 113–126.
- Hong, W. (2005) SNAREs and traffic. *Biochimica et Biophysica Acta*, **1744**, 493–517 (review).
- Hongay, C., Jia, N., Bard, M., and Winston, F. (2002) Mot3 is a transcriptional repressor of ergosterol biosynthetic genes and is required for normal vacuolar function in *Saccharomyces cerevisiae*. *The EMBO Journal*, **21**, 4114–4124.
- Hongay, C.F., Grisafi, P.L., Galitzki, T., and Fink, G.R. (2006) Antisense transcription controls cell fate in *Saccharomyces cerevisiae*. *Cell*, **127**, 735–745.
- Hook, B., Bernstein, D., Zhang, B., and Wickens, M. (2005) RNA–protein interactions in the yeast three-hybrid system: affinity, sensitivity, and enhanced library screening. *RNA (New York, NY)*, **11**, 227–233.
- Hope, I.A. and Struhl, K. (1985) GCN4 protein, synthesized *in vitro*, binds HIS3 regulatory sequences: implications for general control of amino acid biosynthetic genes in yeast. *Cell*, **43**, 177–188.
- Hope, I.A. and Struhl, K. (1986) Functional dissection of a eukaryotic transcriptional activator protein, GCN4 of yeast. *Cell*, **46**, 885–894.
- Hope, I.A. and Struhl, K. (1987) GCN4, a eukaryotic transcriptional activator protein, binds as a dimer to target DNA. *The EMBO Journal*, **6**, 2781–2784.
- Hope, I.A., Mahadevan, S., and Struhl, K. (1988) Structural and functional characterization of the short acidic transcriptional activation region of yeast GCN4 protein. *Nature*, **333**, 635–640.
- Hoppe, T., Matuschewski, K., Rape, M., Schlenker, S., Ulrich, H.D., and Jentsch, S. (2000) Activation of a membrane-bound transcription factor by regulated ubiquitin/proteasome-dependent processing. *Cell*, **102**, 577–586.
- Hopper, A.K. and Kurjan, J. (1981) tRNA synthesis: identification of *in vivo* precursor tRNAs from parental and mutant yeast strains. *Nucleic Acids Research*, **9**, 1019–1029.
- Hopper, A.K., Pai, D.A., and Engelke, D.R. (2010) Cellular dynamics of tRNAs and their genes. *FEBS Letters*, **584**, 310–317.
- Horak, J. (2003) The role of ubiquitin in down-regulation and intracellular sorting of membrane proteins: insights from yeast. *Biochimica et Biophysica Acta*, **1614**, 139–155 (review).
- Horejsi, Z., Takai, H., Adelman, C.A. et al. (2010) CK2 phospho-dependent binding of R2TP complex to TEL2 is essential for mTOR and SMG1 stability. *Molecular Cell*, **39**, 839–850.
- Horikoshi, M., Wang, C.K., Fujii, H., Cromlish, J.A., Weil, P.A., and Roeder, R.G. (1989) Cloning and structure of a yeast gene encoding a general transcription initiation factor TFIID that binds to the TATA box. *Nature*, **341**, 299–303.
- Horikoshi, M., Yamamoto, T., Ohkuma, Y., Weil, P.A., and Roeder, R.G. (1990) Analysis of structure–function relationships of yeast TATA box binding factor TFIID. *Cell*, **61**, 1171–1178.
- Horvitz, H.R. and Herskowitz, I. (1992) Mechanisms of asymmetric cell division, two Bs or not two Bs, that is the question. *Cell*, **66**, 237–255.
- Hosobuchi, M., Kreis, T., and Schekman, R. (1992) *SEC21* is a gene required for ER to Golgi protein transport that encodes a subunit of a yeast coatmer. *Nature*, **360**, 603–605.
- Hou, Y.-M. and Perona, J.J. (2010) Stereochemical mechanisms of tRNA methyltransferases. *FEBS Letters*, **584**, 278–286.
- Houseley, J. and Tollervey, D. (2008) The nuclear RNA surveillance machinery: the link between ncRNAs and genome structure in budding yeast? *Biochimica et Biophysica Acta*, **1779**, 239–246.
- Houseley, J. and Tollervey, D. (2009) The many pathways of RNA degradation. *Cell*, **136**, 763–776.
- Houseley, J., LaCava, J., and Tollervey, D. (2006) RNA-quality control by the exosome. *Nature Reviews Molecular Cell Biology*, **7**, 529–539.
- Houser-Scott, F., Xiao, S., Millikin, C.E., Zengel, J.M., Lindahl, L., and Engelke, D.R. (2002) Interactions among the protein and RNA subunits of *Saccharomyces cerevisiae* nuclear RNase P. *Proceedings of the National Academy of Sciences of the United States of America*, **99**, 2684–2689.
- Hoyer, L.L., Green, C.B., Oh, S.H., and Zhao, X. (2008) Discovering the secrets of the *Candida albicans* agglutinin-like sequence (ALS) gene family – a sticky pursuit. *Medical Mycology*, **46**, 1–15.
- Hoyt, M.A., Stearns, T., and Botstein, D. (1990) Chromosome instability mutants of *Saccharomyces cerevisiae* that are defective in microtubule-mediated processes. *Molecular and Cellular Biology*, **10**, 223–234.
- Hoyt, M.A., Hyman, A.A., and Bähler, M. (1997) Motor proteins of the eukaryotic cytoskeleton. *Proc. Natl. Acad. Sci. USA*, **94**, 12747–12748.
- Hoyt, M.A., Hyman, A.A., and Bähler, M. (1997) Motor proteins of the eukaryotic cytoskeleton. *Proceedings of the National Academy of Sciences of the United States of America*, **94**, 12747–12748.
- Hsia, K.C., Stavropoulos, P., Blobel, G., and Hoelz, A. (2007) Architecture of a coat for the nuclear pore membrane. *Cell*, **131**, 1313–1326.
- Hsu, J.M., Huang, J., Meluh, P.B., and Laurent, B.C. (2003) The yeast RSC chromatin-remodeling complex is required for kinetochore function in chromosome segregation. *Molecular and Cellular Biology*, **23**, 3202–3215.
- Hu, J. and Xiong, Y. (2006) An evolutionarily conserved function of proliferating cell nuclear antigen for Cdt1 degradation by the Cul4–Ddb1 ubiquitin ligase in response to DNA damage. *The Journal of Biological Chemistry*, **281**, 3753–3756.
- Hu, J.C., Kornacker, M.G., and Hochschild, A. (2000) *Escherichia coli* one- and two-hybrid systems for the analysis and identification of protein–protein interactions. *Methods (San Diego, Calif.)*, **20**, 80–94 (review).
- Hu, J.C. (2000) A guided tour in protein interaction space: coiled-coils from the yeast proteome. *Proceedings of the National Academy of Sciences of the United States of America*, **97**, 12935–12936.
- Huang, R.Y. and Kowalski, D. (1993) A DNA unwinding element and an ARS consensus comprise a replication origin within a yeast chromosome. *The EMBO Journal*, **12**, 4521–4524.
- Huang, Y. and Maraia, R.J. (2001) Comparison of the RNA polymerase III transcription machinery in *Schizosaccharomyces pombe*, *Saccharomyces cerevisiae*, and human. *Nucleic Acids Research*, **29**, 2675–2690.
- Huang, M., Zhou, Z., and Elledge, S.J. (1998) The DNA replication and damage checkpoint pathways induce transcription by inhibition of the Crt1 repressor. *Cell*, **94**, 595–605.
- Huang, J., Hsu, J.M., and Laurent, B.C. (2004a) The RSC nucleosome-remodeling complex is required for cohesin’s association with chromosome arms. *Molecular Cell*, **13**, 739–750.
- Huang, J., Zhu, H., Haggarty, S.J. et al. (2004b) Finding new components of the target of rapamycin (TOR) signaling network through chemical genetics and proteome chips. *Proceedings of the National Academy of Sciences of the United States of America*, **101**, 16594–16599.
- Huang, D., Friesen, H., and Andrews, B. (2007) Pho85, a multifunctional cyclin-dependent protein kinase in budding yeast. *Molecular Microbiology*, **66**, 303–314.
- Huang, B., Guo, J., Yi, B., Yu, X., Sun, L., and Chen, W. (2008a) Heterologous production of secondary metabolites as pharmaceuticals in *Saccharomyces cerevisiae*. *Biotechnology Letters*, **30**, 1121–1137.
- Huang, B., Lu, J., and Bytrom, A.S. (2008b) A genome-wide screen identifies genes required for formation of the wobble nucleoside 5-methoxycarbonylmethyl-2-thiouridine in

- Saccharomyces cerevisiae*. RNA (New York, NY), 14, 2183–2194.
- Huen, J., Kakihara, Y., Ugwu, F. *et al.* (2010) Rvb1–Rvb2: essential ATP-dependent helicases for critical complexes. *Biochemistry and Cell Biology*, 88, 29–40.
- Huet, J. and Sentenac, A. (1992) The TATA-binding protein participates in TFIIB assembly on tRNA genes. *Nucleic Acids Research*, 20, 6451–6454.
- Huet, J., Buhler, J.M., Sentenac, A., and Fromageot, P. (1975) Dissociation of two polypeptide chains from yeast RNA polymerase A. *Proceedings of the National Academy of Sciences of the United States of America*, 72, 3034–3038.
- Huet, J., Wyers, F., Buhler, J.M., Sentenac, A., and Fromageot, P. (1976) Association of RNase H activity with yeast RNA polymerase A. *Nature*, 261, 431–433.
- Huet, J., Phalente, L., Buttin, G., Sentenac, A., and Fromageot, P. (1982) Probing yeast RNA polymerase A subunits with monospecific antibodies. *The EMBO Journal*, 1, 1193–1198.
- Huet, J., Riva, M., Sentenac, A., and Fromageot, P. (1985) Yeast RNA polymerase C and its subunits. Specific antibodies as structural and functional probes. *The Journal of Biological Chemistry*, 260, 15304–15310.
- Huet, J., Manaud, N., Dieci, G. *et al.* (1996) RNA polymerase III and class III transcription factors from *Saccharomyces cerevisiae*. *Methods in Enzymology*, 273, 249–267 (review).
- Huffacker, T.C., Hoyt, M.A., and Botstein, D. (1987) Genetic analysis of the yeast cytoskeleton. *Annual Review of Genetics*, 21, 259–284 (review).
- Hug, I., Zheng, B., Reiz, B. *et al.* (2011) Exploiting bacterial glycosylation machineries for the synthesis of a Lewis antigen-containing glycoprotein. *The Journal of Biological Chemistry*, 286, 37887–37894.
- Hughes, H. and Stephens, D.J. (2008) Assembly, organization, and function of the COPII coat. *Histochemistry and Cell Biology*, 129, 129–151.
- Hughes, T.R., Marton, M.J., Jones, A.R. *et al.* (2000) Microarrays on membranes. *Cell*, 102, 109–126.
- Hughes, T.R., Robinson, M.D., Mitsakakis, N., and Johnston, M. (2004) The promise of functional genomics: completing the encyclopedia of a cell. *Current Opinion in Microbiology*, 7, 546–554.
- Huh, W.K., Falvo, J.V., Gerke, L.C. *et al.* (2003) Global analysis of protein localization in budding yeast. *Nature*, 425, 686–691.
- Huibregtse, J.M., Scheffner, M., Beaudenon, S., and Howley, P.M. (1995) A family of proteins structurally and functionally related to the E6-AP ubiquitin–protein ligase. *Proceedings of the National Academy of Sciences of the United States of America*, 92, 2563–2567.
- Hunt, T. (2001) *Protein synthesis, proteolysis and cell cycle transitions*. Nobel Lecture, http://nobelprize.org/nobel_prizes/medicine/laureates/2001/hunt-lecture.html.
- Hunte, C., Zickermann, V., and Brandt, U. (2010) Functional modules and structural basis of conformational coupling in mitochondrial complex I. *Science*, 329, 448–451.
- Hunter, T. and Plowman, G.D. (1997) The protein kinases of budding yeast: six score and more. *Trends in Biochemical Sciences*, 22, 18–22 (review).
- Hurley, J.H. and Emr, S.D. (2006) The ESCRT complexes: structure and mechanism of a membrane-trafficking network. *Annual Review of Biophysics and Biomolecular Structure*, 35, 277–298.
- Hurley, J.H. and Hanson, P.I. (2010) Membrane budding and scission by the ESCRT machinery: it's all in the neck. *Nature Reviews Molecular Cell Biology*, 11, 556–566.
- Hurov, K.E., Cotta-Ramusino, C., and Elledge, S.J. (2010) A genetic screen identifies the triple T complex required for DNA damage signaling and ATM and ATR stability. *Genes and Development*, 24, 1939–1950.
- Hutchins, M.U. and Klionsky, D.J. (2001) Vacuolar localization of oligomeric alpha-mannosidase requires the cytoplasm to vacuole targeting and autophagy pathway components in *Saccharomyces cerevisiae*. *The Journal of Biological Chemistry*, 276, 20491–20498.
- Hutchison, H.T., Hartwell, L.H., and McLaughlin, C. (1969) Temperature-sensitive yeast mutant defective in ribonucleic acid production. *Journal of Bacteriology*, 99, 807–814.
- Hwang, L.H., Lau, L.F., Smith, D.L. *et al.* (1998) Budding yeast Cdc20: a target of the spindle checkpoint. *Science*, 279, 1041–1044.
- Iborra, F., Huet, J., Breant, B., Sentenac, A., and Fromageot, P. (1979) Identification of two different RNase H activities associated with yeast RNA polymerase A. *The Journal of Biological Chemistry*, 254, 10920–10924.
- Ichimura, Y., Kirisako, T., Takao, T. *et al.* (2000) A ubiquitin-like system mediates protein lipidation. *Nature*, 408, 488–492.
- Iglesias, N. and Stutz, F. (2008) Regulation of mRNP dynamics along the export pathway. *FEBS Letters*, 582, 1987–1996.
- Ihmels, J., Bergmann, S., Gerami-Nejad, M. *et al.* (2005) Rewiring of the yeast transcriptional network through the evolution of motif usage. *Science*, 309, 938–940.
- Iizuka, M., Matsui, T., Takisawa, H. *et al.* (2006) Regulation of replication licensing by acetyltransferase Hbo1. *Molecular and Cellular Biology*, 26, 1098–1108.
- Ikemura, T. (1982) Correlation between the abundance of yeast transfer RNAs and the occurrence of the respective codons in protein genes. Differences in synonymous codon choice patterns of yeast and *Escherichia coli* with reference to the abundance of isoaccepting transfer RNAs. *Journal of Molecular Biology*, 158, 573–597.
- Ilina, Y., Sloma, E., Maciaszczyk-Dziubinska, E. *et al.* (2008) Characterization of the DNA-binding motif of the arsenic-responsive transcription factor Yap8p. *The Biochemical Journal*, 415, 467–475.
- Im, J.S., Ki, S.H., Farina, A., Jung, D.S., Hurwitz, J., and Lee, J.K. (2009) Assembly of the Cdc45–Mcm2–7–GINS complex in human cells requires the Ctf4/And-1, RecQL4, and Mcm10 proteins. *Proceedings of the National Academy of Sciences of the United States of America*, 106, 15628–15632.
- Ingvarsdottir, K., Krogan, N.J., Emre, N.C., Wyce, A., Thompson, N.J., Emili, A., Hughes, T.R., Greenblatt, J.F., and Berger, S.L. (2005) H2B ubiquitin protease Ubp8 and Sgf11 constitute a discrete functional module within the *Saccharomyces cerevisiae* SAGA complex. *Molecular and Cellular Biology*, 25, 1162–1172.
- Inoki, K., Ouyang, H., Li, Y., and Guan, K.L. (2005) Signaling by target of rapamycin proteins in cell growth control. *Microbiology and Molecular Biology Reviews*, 69, 79–100.
- Inoue, T., Wilkens, S., and Forgac, M. (2003) Subunit structure, function, and arrangement in the yeast and coated vesicle V-ATPases. *Journal of Bioenergetics and Biomembranes*, 35, 291–299.
- Iraqui, I., Vissers, S., Bernard, F. *et al.* (1999) Amino acid signaling in *Saccharomyces cerevisiae*: a permease-like sensor of external amino acids and F-Box protein Grr1p are required for transcriptional induction of the AGP1 gene, which encodes a broad-specificity amino acid permease. *Molecular and Cellular Biology*, 19, 989–1001.
- Iraqui, I., Garcia-Sanchez, S., Aubert, S. *et al.* (2005) The Yak1p kinase controls expression of adhesins and biofilm formation in *Candida glabrata* in a Sir4p-dependent pathway. *Molecular Microbiology*, 55, 1259–1271.
- Irene, C., Maciariello, C., Cioci, F., Camilloni, G., Newlon, C.S., and Fabiani, L. (2004) Identification of the sequences required for chromosomal replicator function in *Kluyveromyces lactis*. *Molecular Microbiology*, 51, 1413–1423.
- Irimia, M., Penny, D., and Roy, S.W. (2007) Coevolution of genomic intron number and splice sites. *Trends in Genetics*, 23, 321–325.
- Irniger, S., Piatti, S., Michaelis, C., and Nasmyth, K. (1995) Genes involved in sister chromatid separation are needed for B-type cyclin proteolysis in budding yeast. *Cell*, 81, 269–278.
- Irwin, P.A. and Voytas, D.F. (2001) Expression and processing of proteins encoded by the *Saccharomyces retrotransposon* Ty5. *Journal of Virology*, 75, 1790–1797.
- Irwin, B., Aye, M., Baldi, P. *et al.* (2005) Retroviruses and yeast retrotransposons use overlapping sets of host genes. *Genome Research*, 15, 641–654.
- Ishiguro, A., Kassavetis, G.A., and Geiduschek, E.P. (2002) Essential roles of Bdp1, a subunit of RNA polymerase III initiation factor TFIIB, in transcription and tRNA processing. *Molecular and Cellular Biology*, 22, 3264–3275.
- Itakura, K., Hirose, T., Crea, R. *et al.* (1977) Expression in *Escherichia coli* of a chemically synthesized gene for the hormone somatostatin. *Science*, 198, 1056–1063.
- Ito, H., Fukuda, Y., Murata, K., and Kimura, A. (1983) Transformation of intact yeast cells treated with alkali cations. *Journal of Bacteriology*, 153, 163–168.
- Ito, T., Tashiro, K., Muta, S. *et al.* (2000) Toward a protein–protein interaction map of the budding yeast: a comprehensive system to examine two-hybrid interactions in all possible combinations between the yeast proteins. *Proceedings of the National Academy of Sciences of the United States of America*, 97, 1143–1147.
- Ito, T., Chiba, T., Ozawa, R., Yoshida, M., Hattori, M., and Sakaki, Y. (2001) A

- comprehensive two-hybrid analysis to explore the yeast protein interactome. *Proceedings of the National Academy of Sciences of the United States of America*, **98**, 4569–4574.
- Itoh, T., Watabe, A., Toh-E, A., and Matsui, Y. (2002) Complex formation with Ypt11p, a rab-type small GTPase, is essential to facilitate the function of Myo2p, a class V myosin, in mitochondrial distribution in *Saccharomyces cerevisiae*. *Molecular and Cellular Biology*, **22**, 7744–7757.
- Ivanov, D. and Nasmyth, K. (2005) A topological interaction between cohesin rings and a circular minichromosome. *Cell*, **122**, 849–860.
- Iyer, V.R., Horak, C.E., Charles, S. et al. (2001) Genomic binding sites of the yeast cell-cycle transcription factors SBF and MBF. *Nature*, **409**, 533–538.
- Izaurralde, E. (2002) A novel family of nuclear transport receptors mediates the export of messenger RNA to the cytoplasm. *European Journal of Cell Biology*, **81**, 577–584.
- Izawa, S., Ikeda, K., Ohdate, T., and Inoue, Y. (2007) Msn2p/Msn4p activation is essential for the recovery from freezing stress in yeast. *Biochemical and Biophysical Research Communications*, **352**, 750–755.
- Izumi, N., Yamashita, A., Iwamatsu, A. et al. (2010) AAA⁺ proteins RUVBL1 and RUVBL2 coordinate PIKK activity and function in nonsense-mediated mRNA decay. *Science Signaling*, **3**, ra27.
- Jackson, D.A., Symons, R.H., and Berg, P. (1972) Biochemical method for inserting new genetic information into DNA of simian virus 40: circular SV40 DNA molecules containing lambda phage genes and the galactose operon of *Escherichia coli*. *Proceedings of the National Academy of Sciences of the United States of America*, **69**, 2904–2908.
- Jackson, L.P., Reed, S.I., and Haase, S.B. (2006) Distinct mechanisms control the stability of the related S-phase cyclins Clb5 and Clb6. *Molecular and Cellular Biology*, **26**, 2456–2466.
- Jackson, A.P., Gamble, J.A., Yeomans, T. et al. (2009) Comparative genomics of the fungal pathogens *Candida dubliniensis* and *Candida albicans*. *Genome Research*, **19**, 2231–2244.
- Jacobs, S.A. and Khorasanizadeh, S. (2002) Structure of HP1 chromodomain bound to a lysine 9-methylated histone H3 tail. *Science*, **295**, 2080–2083.
- Jacobson, S.J., Laursen, P.M., and Pillus, L. (2004) Functional analyses of chromatin modifications in yeast. *Methods in Enzymology*, **377**, 3–55 (review).
- Jacq, C., Lazowska, J., and Slonimski, P.P. (1980) Sur un nouveau mécanisme de la régulation de l'expression génétique. *Comptes rendus des séances de l'Académie des sciences. Série D, Sciences naturelles*, **290**, 1–4.
- Jacques, N., Sacerdot, C., Derkaoui, M., Dujon, B., Ozier-Kalogeropoulos, O., and Casaregola, S. (2010) Population polymorphism of nuclear mitochondrial DNA insertions reveals widespread diploidy associated with loss of heterozygosity in *Debaryomyces hansenii*. *Eukaryotic Cell*, **9**, 449–459.
- Jacquier, A. and Dujon, B. (1985) An intron-encoded protein is active in a gene conversion process that spreads an intron into a mitochondrial gene. *Cell*, **41**, 383–394.
- Jaehning, J.A. (2010) The Paf1 complex: platform or player in RNA polymerase II transcription? *Biochimica et Biophysica Acta*, **1799**, 379–388.
- Jahn, R. and Scheller, R.H. (2006) SNAREs – engines for membrane fusion. *Nature Reviews Molecular Cell Biology*, **7**, 631–643.
- Jamai, A., Dubois, E., Vershon, A.K., and Messenguy, F. (2002) Swapping functional specificity of a MADS box protein: residues required for Arg80 regulation of arginine metabolism. *Molecular and Cellular Biology*, **22**, 5741–5752.
- James, S.A., Turner, W., and Schwer, B. (2002) How Slu7 and Prp18 cooperate in the second step of yeast pre-mRNA splicing. *RNA (New York, NY)*, **8**, 1068–1077.
- James, T.Y., Kauff, F., Schoch, C.L. et al. (2006) Reconstructing the early evolution of fungi using a six-gene phylogeny. *Nature*, **443**, 818–822.
- James, T.C., Usher, J., Campbell, S., and Bond, U. (2008) Lager yeasts possess dynamic genomes that undergo rearrangements and gene amplification in response to stress. *Current Genetics*, **53**, 139–152.
- Januszyk, K. and Lima, C.D. (2010) Structural components and architectures of RNA exosomes. *Advances in Experimental Medicine and Biology*, **702**, 9–28.
- Jaquenoud, M., Gulli, M.P., Peter, K., and Peter, M. (1998) The Cdc42p effector Gic2p is targeted for ubiquitin-dependent degradation by the SCF^{Grr1} complex. *The EMBO Journal*, **17**, 5360–5373.
- Jarboe, L.R., Zhang, X., Wang, X., Moore, J.C., Shanmugam, K.T., and Ingram, L.O. (2010) Metabolic engineering for production of biorenewable fuels and chemicals: contributions of synthetic biology. *Journal of Biomedicine & Biotechnology*, **2010**, 761042 (review).
- Jarosch, E., Taxis, C., Volkwein, C. et al. (2002) Protein dislocation from the ER requires polyubiquitination and the AAA-ATPase Cdc48. *Nature Cell Biology*, **4**, 134–139.
- Jaspersen, S.L. and Winey, M. (2004) The budding yeast spindle pole body: structure, duplication, and function. *Annual Review of Cell and Developmental Biology*, **20**, 1–28.
- Jaspersen, S.L., Charles, J.F., Tinker-Kulberg, R.L., and Morgan, D.O. (1998) A late mitotic regulatory network controlling cyclin destruction in *Saccharomyces cerevisiae*. *Molecular Biology of the Cell*, **9**, 2803–2817.
- Jazayeri, A. and Jackson, S.P. (2002) Screening the yeast genome for new DNA-repair genes. *Genome Biology*, **3**, 1009.1–1009.5 (review).
- Jeffreys, A.J. and Flavell, R.A. (1977) The rabbit beta-globin gene contains a large insert in the coding sequence. *Cell*, **12**, 1097–1108.
- Jeffries, T.W. and Van Vleet, J.R. (2009) *Pichia stipitis* genomics, transcriptomics, and gene clusters. *FEMS Yeast Research*, **9**, 793–807.
- Jeffries, T.W., Grigoriev, I.V., Grimwood, J. et al. (2007) Genome sequence of the lignocellulose-bioconverting and xylose-fermenting yeast *Pichia stipitis*. *Nature Biotechnology*, **25**, 319–326.
- Jeffries, T.W. (2006) Engineering yeasts for xylose metabolism. *Current Opinion in Biotechnology*, **17**, 320–326.
- Jeffries, T.W. (2008) Engineering the *Pichia stipitis* genome for fermentation of hemicellulose hydrolysates, in *Bioenergy* (eds J.D. Wall, C.S. Harwood, and A. Demain), American Society for Microbiology, Washington, DC, pp. 37–47.
- Jelinsky, S.A., Estep, P., Church, G.M., and Samson, L.D. (2000) Regulatory networks revealed by transcriptional profiling of damaged *Saccharomyces cerevisiae* cells: Rpn4 links base excision repair with proteasomes. *Molecular and Cellular Biology*, **20**, 8157–8167.
- Jensen, R., Sprague, G.F.Jr, and Herskowitz, I. (1983) Regulation of yeast mating-type interconversion: feedback control of HO gene expression by the mating-type locus. *Proceedings of the National Academy of Sciences of the United States of America*, **80**, 3035–3039.
- Jensen, T.H., Boulay, J., Rosbash, M., and Libri, D. (2001) The DECD box putative ATPase Sub2p is an early mRNA export factor. *Current Biology*, **11**, 1711–1715.
- Jensen, L.J., Jensen, T.S., de Lichtenberg, U., Brunak, S., and Bork, P. (2006) Co-evolution of transcriptional and post-translational cell-cycle regulation. *Nature*, **443**, 594–597.
- Jensen, L.J., Kuhn, M., Stark, M. et al. (2009) STRING 8 – a global view on proteins and their functional interactions in 630 organisms. *Nucleic Acids Research*, **37** (Database Issue), D412–D416.
- Jentsch, S., McGrath, J.P., and Varshavsky, A. (1987) The yeast DNA repair gene *RAD6* encodes a ubiquitin-conjugating enzyme. *Nature*, **329**, 131–134.
- Jentsch, S., Seufert, W., Sommer, T., and Reins, H.-A. (1990) Ubiquitin-conjugating enzymes: novel regulators of eukaryotic cells. *Trends in Biochemical Sciences*, **15**, 195–198.
- Jenuwein, T. and Allis, C.D. (2001) Translating the histone code. *Science*, **293**, 1074–1080.
- Jeong, K.J., Jang, S.H., and Velmurugan, N. (2011) Recombinant antibodies: engineering and production in yeast and bacterial hosts. *Journal of Biotechnology*, **6**, 16–27 (review).
- Jessop, L. and Lichten, M. (2008) Mus81/Mms4 endonuclease and Sgs1 helicase collaborate to ensure proper recombination intermediate metabolism during meiosis. *Molecular Cell*, **31**, 313–323.
- Ji, H., Moore, D.P., Blomberg, M.A., Braiterman, L.T., Voytas, D.F., Natsoulis, G., and Boeke, J. D. (1993) Hotspots for unselected Ty1 transposition events on yeast chromosome III are near tRNA genes and LTR sequences. *Cell*, **73**, 1007–1018.
- Jiang, Y. and Broach, J.R. (1999) Tor proteins and protein phosphatase 2A reciprocally regulate Tap42 in controlling cell growth in yeast. *The EMBO Journal*, **18**, 2782–2792.
- Jiang, H., Wood, K.V., and Morgan, J.A. (2005) Metabolic engineering of the phenylpropanoid pathway in *Saccharomyces cerevisiae*. *Applied and Environmental Microbiology*, **71**, 2962–2969.
- Jin, J., Arias, E.E., Chen, J., Harper, J.W., and Walter, J.C. (2006) A family of diverse Cul4–Ddb1-interacting proteins includes Cdt2, which is required for S phase destruction of the replication factor Cdt1. *Molecular Cell*, **23**, 709–721.
- Joazeiro, C.A., Kassavetis, G.A., and Geiduschek, E.P. (1996) Alternative outcomes in assembly of promoter complexes: the roles of TBP and a flexible linker in placing TFIIB on tRNA genes. *Genes and Development*, **10**, 725–739.

- Joglekar, A.P., Bloom, K.S., and Salmon, E.D. (2010) Mechanisms of force generation by end-on kinetochore-microtubule attachments. *Curr Opin Cell Biol.*, **22**, 57.
- Joglekar, A.P., Bloom, K.S., and Salmon, E.D. (2010) Mechanisms of force generation by end-on kinetochore-microtubule attachments. *Current Opinion in Cell Biology*, **22**, 57.
- Johnson, E.S. and Blobel, G. (1999) Cell cycle-regulated attachment of the ubiquitin-related protein SUMO to the yeast septins. *The Journal of Cell Biology*, **147**, 981–994.
- Johnson, E.S. and Gupta, A.A. (2001) An E3-like factor that promotes SUMO conjugation to the yeast septins. *Cell*, **106**, 735–744.
- Johnson, R.E., Kovvali, G.K., Prakash, L., and Prakash, S. (1995) Requirement of the yeast RTH1 5' to 3' exonuclease for the stability of simple repetitive DNA. *Science*, **269**, 238–240.
- Johnson, E.S., Schwienhorst, I., Dohmen, R.J., and Blobel, G. (1997) The ubiquitin-like protein Smt3p is activated for conjugation to other proteins by an Aos1p/Uba2p heterodimer. *The EMBO Journal*, **16**, 5509–5519.
- Johnson, P.R., Swanson, R., Rakhilina, L., and Hochstrasser, M. (1998) Degradation signal masking by heterodimerization of MATA2 and MATA1 blocks their mutual destruction by the ubiquitin–proteasome pathway. *Cell*, **94**, 217–227.
- Johnson, L.J., Koufopanou, I.V., Goddard, M.R. et al. (2004) Population genetics of the wild yeast *Saccharomyces paradoxus*. *Genetics*, **166**, 43–52.
- Johnson, D.C., Dean, D.R., Smith, A.D., and Johnson, M.K. (2005) Structure, function, and formation of biological iron–sulfur clusters. *Annual Review of Biochemistry*, **74**, 247–281.
- Johnson, B.S., McCaffery, J.M., Lindquist, S., and Gitler, A.D. (2008) A yeast TDP-43 proteinopathy model: exploring the molecular determinants of TDP-43 aggregation and cellular toxicity. *Proceedings of the National Academy of Sciences of the United States of America*, **105**, 6439–6444.
- Johnston, M. and Kim, J.H. (2004) Glucose as a hormone: receptor-mediated glucose sensing in the yeast *Saccharomyces cerevisiae*. *Biochemical Society Transactions*, **33**, 247–252.
- Johnston, G.C., Prendergast, J.A., and Singer, R. A. (1991) The *Saccharomyces cerevisiae* MYO2 gene encodes an essential myosin for vectorial transport of vesicles. *The Journal of Cell Biology*, **113**, 539–35.
- Johnston, M., Andrews, S., Brinkman, R. et al. (1994) Complete nucleotide sequence of *Saccharomyces cerevisiae* chromosome VIII. *Science*, **265**, 2077–2082.
- Johnston, J.R. (ed.) (1994) *Molecular Genetics of Yeast: A Practical Approach*, IRL Press, Oxford.
- Johnston, M. (1999) Feasting, fasting and fermenting: glucose sensing in yeast and other cells. *Trends in Genetics*, **15**, 29–33.
- Jolly, E.R., Chin, C.S., Herskowitz, I., and Li, H. (2005) Genome-wide identification of the regulatory targets of a transcription factor using biochemical characterization and computational genomic analysis. *BMC Bioinformatics*, **6**, 275.
- Jones, D.R. and Divecha, N. (2004) Linking lipids to chromatin. *Current Opinion in Genetics & Development*, **14**, 196–202.
- Jones, S., Newman, C., Liu, F., and Segev, N. (2000) The TRAPP complex is a nucleotide exchanger for Ypt1 and Ypt31/32. *Molecular Biology of the Cell*, **11**, 4403–4411.
- Jones, T., Federspiel, N.A., Chibana, H. et al. (2004) The diploid genome sequence of *Candida albicans*. *Proceedings of the National Academy of Sciences of the United States of America*, **101**, 7329–7334.
- Jones, E.W. (1984) The synthesis and function of proteases in *Saccharomyces*: genetic approaches. *Annual Review of Genetics*, **18**, 233–270 (review).
- Jones, E.W. (1991) Three proteolytic systems in the yeast *Saccharomyces cerevisiae*. *The Journal of Biological Chemistry*, **266**, 7963–7966 (review).
- Jong, W.S., Sauri, A., and Luirink, J. (2010) Extracellular production of recombinant proteins using bacterial autotransporters. *Current Opinion in Biotechnology*, **21**, 646–52 (review).
- Jonsson, Z.O., Dhar, S.K., Narlikar, G.J. et al. (2001) Rvb1p and Rvb2p are essential components of a chromatin remodeling complex that regulates transcription of over 5% of yeast genes. *The Journal of Biological Chemistry*, **276**, 16279–16288.
- Jonsson, Z.O., Jha, S., Wohlschlegel, J.A., and Dutta, A. (2004) Rvb1p/Rvb2p recruit Arp5p and assemble a functional Ino80 chromatin remodeling complex. *Molecular Cell*, **16**, 465–477.
- Jordan, P.W., Klein, F., and Leach, D.R. (2007) Novel roles for selected genes in meiotic DNA processing. *PLoS Genetics*, **3**, e222.
- Jorgensen, P., Nishikawa, J.L., Breitkreutz, B.J., and Tyers, M. (2002) Systematic identification of pathways that couple cell growth and division in yeast. *Science*, **297**, 395–400.
- Joshua, D., Schnell, J.D., and Hicke, L. (2003) Non-traditional functions of ubiquitin and ubiquitin-binding proteins. *The Journal of Biological Chemistry*, **278**, 35857–35860.
- Joyner, P.M., Matheke, R.M., Smith, L.M., and Cichewicz, R.H. (2010) Probing the metabolic aberrations underlying mutant huntingtin toxicity in yeast and assessing their degree of preservation in humans and mice. *Journal of Proteome Research*, **9**, 404–412.
- Ju, D. and Xie, Y. (2004) Proteasomal degradation of RPN4 via two distinct mechanisms, ubiquitin-dependent and -independent. *The Journal of Biological Chemistry*, **279**, 23851–23854.
- Ju, D. and Xie, Y. (2006) Identification of the preferential ubiquitination site and ubiquitin-dependent degradation signal of Rpn4. *The Journal of Biological Chemistry*, **281**, 10657–10662.
- Ju, Q.D., Morrow, B.E., and Warner, J.R. (1990) REB1, a yeast DNA-binding protein with many targets, is essential for growth and bears some resemblance to the oncogene *myb*. *Molecular and Cellular Biology*, **10**, 5226–5234.
- Jungwirth, H. and Kuchler, K. (2006) Yeast ABC transporters – a tale of sex, stress, drugs and aging. *FEBS Letters*, **580**, 1131–1138.
- Juo, Z.S., Kassavetis, G.A., Wang, J., Geiduschek, E.P., and Sigler, P.B. (2003) Crystal structure of a transcription factor IIIB core interface ternary complex. *Nature*, **422**, 534–539.
- Kaake, R.M., Wang, X., and Huang, L. (2010) Profiling of protein interaction networks of protein complexes using affinity purification and quantitative mass spectrometry. *Molecular & Cellular Proteomics*, **9**, 1650–1665.
- Kaback, D.B. and Davidson, N. (1980) Organization of the ribosomal RNA gene cluster in the yeast *Saccharomyces cerevisiae*. *Journal of Molecular Biology*, **138**, 745–754.
- Kaback, D.B. and Halvorson, H.O. (1977) Magnification of genes coding for ribosomal RNA in *Saccharomyces cerevisiae*. *Proceedings of the National Academy of Sciences of the United States of America*, **74**, 1177–1180.
- Kaback, D.B., Halvorson, H.O., and Rubin, G. M. (1976) Location and magnification of 5S RNA genes in *Saccharomyces cerevisiae*. *Journal of Molecular Biology*, **107**, 385–390.
- Kachouri, R., Stribinskis, V., Zhu, Y., Ramos, K. S., Westhof, E., and Li, Y. (2005) A surprisingly large RNase P RNA in *Candida glabrata*. *RNA (New York, NY)*, **11**, 1064–1072.
- Kachouri-Lafond, R., Dujon, B., Gilson, E., Westhof, E., Fairhead, C., and Teixeira, M.T. (2009) Large telomerase RNA, telomere length heterogeneity and escape from senescence in *Candida glabrata*. *FEBS Letters*, **583**, 3605–3610.
- Kadaba, S., Krueger, A., Trice, T., Krecic, A.M., Hinnebusch, A.G., and Anderson, J. (2004) Nuclear surveillance and degradation of hypomodified initiator tRNA^{Met} in *S. cerevisiae*. *Genes and Development*, **18**, 1227–1240.
- Kaeberlein, M. and Kennedy, B.K. (2005) Large-scale identification in yeast of conserved ageing genes. *Mechanisms of Ageing and Development*, **126**, 17–21.
- Kaeberlein, M., Powers, R.W.III, Stefan, K.K. et al. (2006) Regulation of yeast replicative life span by TOR and Sch9 in response to nutrients. *Science*, **310**, 1193–1196.
- Kaiser, P., Sia, R.A., Bardes, E.G., Lew, D.J., and Reed, S.I. (1998) Cdc34 and the F-box protein Met30 are required for degradation of the Cdk-inhibitory kinase Swe1. *Genes and Development*, **12**, 2587–2597.
- Kal, A.J., Hettema, E.H., van denBerg, M. et al. (2000) *In silico* search for genes encoding peroxisomal proteins in *Saccharomyces cerevisiae*. *Cell Biochemistry and Biophysics*, **32**, 1–8.
- Kaldi, K., Bauer, M.F., Sirrenberg, C., Neupert, W., and Brunner, M. (1998) Biogenesis of Tim23 and Tim17, integral components of the TIM machinery for matrix-targeted preproteins. *The EMBO Journal*, **17**, 1569–1576.
- Kamada, Y., Funakoshi, T., Shintani, T., Nagano, K., Ohsumi, M., and Ohsumi, Y. (2000) TOR-mediated induction of autophagy via an Apg1 protein kinase complex. *The Journal of Cell Biology*, **150**, 1507–1513.
- Kamada, Y., Fujioka, Y., Suzuki, N.N. et al. (2005) Tor2 directly phosphorylates the AGC kinase Ypk2 to regulate actin polarization. *Molecular and Cellular Biology*, **25**, 7239–7248.
- Kane, P.M. and Smardon, A.M. (2003) Assembly and regulation of the yeast vacuolar H⁺-ATPase. *Journal of Bioenergetics and Biomembranes*, **35**, 313–321 (review).
- Kane, P.M., Yamashiro, C.T., Rothman, J.H., and Stevens, T.H. (1989) Protein sorting in yeast: the role of the vacuolar

- proton-translocating ATPase. *Journal of Cell Science. Supplement*, **11**, 161–178 (review).
- Kanemaki, M., Sanchez-Diaz, A., Gambus, A., and Labib, K. (2003) Functional proteomic identification of DNA replication proteins by induced proteolysis *in vivo*. *Nature*, **423**, 720–724.
- Kang, H.A. and Gellissen, G. (2005) *Hansenula polymorpha*, in *Production of Recombinant Proteins – Novel Microbial and Eukaryotic Expression Systems* (eds G. Gellissen), Wiley-VCH Verlag GmbH, Weinheim, pp. 111–142.
- Kang, P.J., Ostermann, J., Shilling, J., Neupert, W., Craig, E.A., and Pfanner, N. (1990) Requirement for hsp70 in the mitochondrial matrix for translocation and folding of precursor proteins. *Nature*, **348**, 137–143.
- Kang, P.J., Angerman, E., Nakashima, K., Pringle, J.R., and Park, H.O. (2004) Interactions among Rax1p, Rax2p, Bud8p, and Bud9p in marking cortical sites for bipolar bud-site selection in yeast. *Molecular Biology of the Cell*, **15**, 5145–5157.
- Kaplan, C.D., Laprade, L., and Winston, F. (2003) Transcription elongation factors repress transcription initiation from cryptic sites. *Science*, **301**, 1096–1099.
- Kaplan, N., Moore, I.K., Fondufe-Mittendorf, Y. *et al.* (2009) The DNA-encoded nucleosome organization of a eukaryotic genome. *Nature*, **458**, 362–366.
- Kaplun, L., Ivantsiv, Y., Bakhrat, A., and Raveh, D. (2003) DNA damage response-mediated degradation of HO endonuclease via the ubiquitin system involves its nuclear export. *The Journal of Biological Chemistry*, **278**, 48727–48734.
- Kaput, J., Goltz, S., and Blobel, G. (1982) Nucleotide sequence of the yeast nuclear gene for cytochrome *c* peroxidase precursor. Functional implications of the pre sequence for protein transport into mitochondria. *The Journal of Biological Chemistry*, **257**, 15054–15058.
- Karsenti, E. and Vernos, I. (2001) The mitotic spindle: a self-made machine. *Science*, **294**, 543–547.
- Karst, S.M., Rutz, M.L., and Menees, T.M. (2000) The yeast retrotransposons Ty1 and Ty3 require the RNA lariat debranching enzyme, Dbr1p, for efficient accumulation of reverse transcripts. *Biochemical and Biophysical Research Communications*, **268**, 112–117.
- Kassavetis, G.A., Joazeiro, C.A., Pisano, M. *et al.* (1992) The role of the TATA-binding protein in the assembly and function of the multisubunit yeast RNA polymerase III transcription factor TFIIIB. *Cell*, **71**, 1055–1064.
- Kassir, Y., Adir, N., Boger-Nadjar, E. *et al.* (2003) Transcriptional regulation of meiosis in budding yeast. *International Review of Cytology*, **224**, 111–171.
- Kastenmayer, J.P., Ni, L., Chu, A. *et al.* (2006) Functional genomics of genes with small open reading frames (sORFs) in *S. cerevisiae*. *Genome Research*, **16**, 365–373.
- Katahira, J., Strasser, K., Podtelejnikov, A., Mann, M., Jung, J.U., and Hurt, E. (1999) The Mex67p-mediated nuclear mRNA export pathway is conserved from yeast to human. *The EMBO Journal*, **18**, 2593–2609.
- Katis, V.L., Galova, M., Rabitsch, K.P., Gregan, J., and Nasmyth, K. (2004a) Maintenance of cohesin at centromeres after meiosis I in budding yeast requires a kinetochore-associated protein related to MEI-S332. *Current Biology*, **14**, 560–572.
- Katis, V.L., Matos, J., Mori, S., Shirahige, K., Zachariae, W., and Nasmyth, K. (2004b) Spo13 facilitates monopolin recruitment to kinetochores and regulates maintenance of centromeric cohesion during yeast meiosis. *Current Biology*, **14**, 2183–2196.
- Katzmann, D.J., Babst, M., and Emr, S.D. (2001) Ubiquitin-dependent sorting into the multivesicular body pathway requires the function of a conserved endosomal protein sorting complex, ESCRT-I. *Cell*, **106**, 145–155.
- Katzmann, D.J., Sarkar, S., Chu, T., Audhya, A., and Emr, S.D. (2004) Multivesicular body sorting: ubiquitin ligase Rsp5 is required for the modification and sorting of carboxypeptidase S. *Molecular Biology of the Cell*, **15**, 468–480.
- Kaufman, B.A., Kolesar, J.E., Perlman, P.S., and Butow, R.A. (2003) A function for the mitochondrial chaperonin Hsp60 in the structure and transmission of mitochondrial DNA nucleoids in *Saccharomyces cerevisiae*. *The Journal of Cell Biology*, **163**, 457–461.
- Kaufmann, A. (2009) A plasmid collection for PCR-based gene targeting in the filamentous ascomycete *Ashbya gossypii*. *Fungal Genetics and Biology*, **46**, 595–603.
- Kaur, R., Domergue, R., Zupancic, M.L., and Cormack, B.P. (2005) A yeast by any other name, *Candida glabrata* and its interaction with the host. *Current Opinion in Microbiology*, **8**, 378–384.
- Kaur, R., Ma, B., and Cormack, B.P. (2007) A family of glycosylphosphatidylinositol-linked aspartyl proteases is required for virulence of *Candida glabrata*. *Proceedings of the National Academy of Sciences of the United States of America*, **104**, 7628–7633.
- Kavanaugh, L.A., Fraser, J.A., and Dietrich, F.S. (2006) Recent evolution of the human pathogen *Cryptococcus neoformans* by intervarietal transfer of a 14-gene fragment. *Molecular Biology and Evolution*, **23**, 1879–1890.
- Kazuki, Y. and Oshimura, M. (2011) Human artificial chromosomes for gene delivery and the development of animal models. *Molecular Therapy: The Journal of the American Society of Gene Therapy*, **19**, 1591–1601.
- Kealey, J.T., Liu, L., Santi, D.V., Betlach, M.C., and Barr, P.J. (1998) Production of a polyketide natural product in nonpolyketide-producing prokaryotic and eukaryotic hosts. *Proceedings of the National Academy of Sciences of the United States of America*, **95**, 505–509.
- Keasling, J.D. (2010) Manufacturing molecules through metabolic engineering. *Science*, **330**, 1355–1358 (review).
- Kee, Y. and Huijbregtse, J.M. (2007) Regulation of catalytic activities of HECT ubiquitin ligases. *Biochemical and Biophysical Research Communications*, **354**, 329–333.
- Kee, Y., Lyon, N., and Huijbregtse, J.M. (2005) The Rsp5 ubiquitin ligase is coupled to and antagonized by the Ubp2 deubiquitinating enzyme. *The EMBO Journal*, **24**, 2414–2424.
- Keegan, L., Gill, G., and Ptashne, M. (1986) Separation of DNA binding from the transcription-activating function of a eukaryotic regulatory protein. *Science*, **231**, 699–704.
- Keeney, S. and Neale, M.J. (2006) Initiation of meiotic recombination by formation of DNA double-strand breaks: mechanism and regulation. *Biochemical Society Transactions*, **34**, 523–525.
- Keeney, S. (2001) Mechanism and control of meiotic recombination initiation. *Current Topics in Developmental Biology*, **52**, 1–53.
- Kegel, A., Martinez, P., Carter, S.D., and Astrom, S.U. (2006) Genome wide distribution of illegitimate recombination events in *Kluyveromyces lactis*. *Nucleic Acids Research*, **34**, 1633–1645.
- Keleher, C.A., Redd, M.J., Schultz, J., Carlson, M., and Johnson, A.D. (1992) Ssn6–Tup1 is a general repressor of transcription in yeast. *Cell*, **68**, 709–719.
- Kelleher, R.J.3rd, Flanagan, P.M., and Kornberg, R.D. (1990) A novel mediator between activator proteins and the RNA polymerase II transcription apparatus. *Cell*, **61**, 1209–1215.
- Keller, P.J. and Knop, M. (2009) Evolution of mutational robustness in the yeast genome, a link to essential genes and meiotic recombination hotspots. *PLoS Genetics*, **5**, e1000533.
- Keller, W. and Minvielle-Sebastia, L. (1997) A comparison of mammalian and yeast pre-mRNA 3'-end processing. *Current Opinion in Cell Biology*, **9**, 329–336 (review).
- Keller, W. (1984) The RNA lariat: a new ring to the splicing of mRNA precursors. *Cell*, **39**, 423–425.
- Keller, W. (1995) No end yet to messenger RNA 3' processing! *Cell*, **81**, 829–832 (review).
- Kellis, M., Patterson, N., Endrizzi, M., Birren, B., and Lander, E.S. (2003) Sequencing and comparison of yeast species to identify genes and regulatory elements. *Nature*, **423**, 241–254.
- Kellis, M., Birren, B.W., and Lander, E.S. (2004) Proof and evolutionary analysis of ancient genome duplication in the yeast *Saccharomyces cerevisiae*. *Nature*, **428**, 617–624.
- Kenna, M.A., Brachmann, C.B., Devine, S.E., and Boeke, J.D. (1998) Invading the yeast nucleus: a nuclear localization signal at the C terminus of Ty1 integrase is required for transposition *in vivo*. *Molecular and Cellular Biology*, **18**, 1115–1124.
- Kennedy, B.K., Austriaco, N.R., Zhang, J., and Guarente, L. (1995) Mutation in the silencing gene SIR4 can delay aging in *S. cerevisiae*. *Cell*, **80**, 485–496.
- Keogh, M.C., Podolny, V., and Buratowski, S. (2003) Bur1 kinase is required for efficient transcription elongation by RNA polymerase II. *Molecular and Cellular Biology*, **23**, 7005–70018.
- Kerrest, A., Anand, R.P., Sundararajan, R. *et al.* (2009) SRS2 and SGS1 prevent chromosomal breaks and stabilize triplet repeats by restraining recombination. *Nature Structural & Molecular Biology*, **16**, 159–167.
- Kersten, S., Desvergne, B., and Wahli, W. (2000) Roles of PPARs in health and disease. *Nature*, **405**, 421–424.
- Ketel, C., Wang, H.S.W., McClellan, M. *et al.* (2009) Neocentromeres form efficiently at

- multiple possible loci in *Candida albicans*. *PLoS Genetics*, **5**, e1000400.
- Khaw, T.S., Katakura, Y., Ninomiya, K. *et al.* (2007) Enhancement of ethanol production by promoting surface contact between starch granules and arming yeast in direct ethanol fermentation. *Journal of Bioscience and Bioengineering*, **103**, 95–97.
- Köhler, A., Pascual-García, P., Llopis, A., Zapater, M., Posas, F., Hurt, E., and Rodríguez-Navarro, S. (2006) The mRNA export factor Sus1 is involved in Spt/Ada/Gcn5 acetyltransferase-mediated H2B deubiquitinylation through its interaction with Ubp8 and Sgf11. *Molecular Biology of the Cell*, **17**, 4228–4236.
- Kief, D.R. and Warner, J.R. (1981) Hierarchy of elements regulating synthesis of ribosomal proteins in *Saccharomyces cerevisiae*. *Molecular and Cellular Biology*, **1**, 1016–1023.
- Kiel, J.A.K.W. (2010) Autophagy in unicellular eukaryotes. *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences*, **365**, 819–830.
- Kim, T. and Buratowski, S. (2007) Two *Saccharomyces cerevisiae* JmjC domain proteins demethylate histone H3 Lys36 in transcribed regions to promote elongation. *The Journal of Biological Chemistry*, **282**, 20827–20835.
- Kim, S.H. and Lin, R.J. (1996) Spliceosome activation by PRP2 ATPase prior to the first transesterification reaction of pre-mRNA splicing. *Molecular and Cellular Biology*, **16**, 6810–6819.
- Kim, T.K. and Roeder, R.G. (1993) Transcriptional activation in yeast by the proline-rich activation domain of human CTF1. *The Journal of Biological Chemistry*, **268**, 20866–20869.
- Kim, T.K. and Roeder, R.G. (1994) Involvement of the basic repeat domain of TATA-binding protein (TBP) in transcription by RNA polymerases I, II, and III. *The Journal of Biological Chemistry*, **269**, 4891–4894.
- Kim, C.H. and Warner, J.R. (1983) Messenger RNA for ribosomal proteins in yeast. *Journal of Molecular Biology*, **165**, 79–89.
- Kim, S.-H. and Yi, S.V. (2006) Correlated asymmetry of sequence and functional divergence between duplicate proteins of *Saccharomyces cerevisiae*. *Molecular Biology and Evolution*, **23**, 1068–1075.
- Kim, J., Tzamarías, D., Harrison, S.C., and Struhl, K. (1993) Adaptability at the protein–DNA interface is an important aspect of sequence recognition by bZIP proteins. *Proceedings of the National Academy of Sciences of the United States of America*, **90**, 4513–4517.
- Kim, Y.J., Bjorklund, S., Li, Y., Sayre, M.H., and Kornberg, R.D. (1994) A multiprotein mediator of transcriptional activation and its interaction with the C-terminal repeat domain of RNA polymerase II. *Cell*, **77**, 599–608.
- Kim, J.M., Vanguri, S., Boeke, J.D., Gabriel, A., and Voytas, D.F. (1998) Transposable elements and genome organization: a comprehensive survey of retrotransposons revealed by the complete *Saccharomyces cerevisiae* genome sequence. *Genome Research*, **8**, 464–478.
- Kim, J., Huang, W.-P., Stromhaug, P.E., and Klionsky, D.J. (2002) Convergence of multiple autophagy and cytoplasm to vacuole targeting components to a perivacuolar membrane compartment prior to *de novo* vesicle formation. *The Journal of Biological Chemistry*, **277**, 763–773.
- Kim, Y.J., Oh, Y.K., Kang, W., Lee, E.Y., and Park, S. (2005) Production of human caseinomacropptide in recombinant *Saccharomyces cerevisiae* and *Pichia pastoris*. *Journal of Industrial Microbiology & Biotechnology*, **32**, 402–408.
- Kim, H., Hu, W., and Kluger, Y. (2006) Unraveling condition specific gene transcriptional regulatory networks in *Saccharomyces cerevisiae*. *BMC Bioinformatics*, **7**, 165.
- Kim, J., Guermah, M., and Roeder, R.G. (2010) The human paf complex acts in chromatin transcription elongation both independently and cooperatively with SII/TFIIS. *Cell*, **140**, 491–503.
- Kim, H.S., Hong, J.T., Kim, Y., and Han, S.B. (2011) Stimulatory effect of β -glucans on immune cells. *Immune Network*, **11**, 191–195.
- Kimmelman, J., Kaldis, P., Hengartner, C.J. *et al.* (1999) Activating phosphorylation of the Kin28p subunit of yeast TFIIB by Cak1p. *Molecular and Cellular Biology*, **19**, 4774–4787.
- Kimura, Y., Rutherford, S.L., Miyata, Y. *et al.* (1997) Cdc37 is a molecular chaperone with specific functions in signal transduction. *Genes and Development*, **11**, 1775–1785.
- King, D.S. and Beggs, J.D. (1990) Interactions of PRP2 protein with pre-mRNA splicing complexes in *Saccharomyces cerevisiae*. *Nucleic Acids Research*, **18**, 6559–6564.
- King, R.W., Peters, J.M., Tugendreich, S., Rolfe, M., Hieter, P., and Kirschner, M.W. (1995) A 20S complex containing CDC27 and CDC16 catalyzes the mitosis-specific conjugation of ubiquitin to cyclin B. *Cell*, **81**, 269–278.
- King, N.L., Deutsch, E., Ranish, J.A. *et al.* (2006) Analysis of the *Saccharomyces cerevisiae* proteome with PeptideAtlas. *Genome Biology*, **7**, 106.
- Kirchhausen, T. (2000) Three ways to make a vesicle. *Nat. Rev. Mol. Cell. Biol.*, **1**, 187–198.
- Kirchhausen, T. (2000) Three ways to make a vesicle. *Nature Reviews Molecular Cell Biology*, **1**, 187–198.
- Kirchner, J., Connolly, C.M., and Sandmeyer, S. B. (1995) Requirement of RNA polymerase III transcription factors for in vitro position-specific integration of a retroviruslike element. *Science*, **267**, 1488–491.
- Kirino, Y. and Suzuki, T. (2005) Human mitochondrial diseases associated with tRNA wobble modification deficiency. *RNA Biology*, **2**, 41–44.
- Kirmizis, A., Santos-Rosa, H., Penkett, C.J. *et al.* (2007) Arginine methylation at histone H3R2 controls deposition of H3K4 trimethylation. *Nature*, **449**, 928–932.
- Kispal, G., Csere, P., Guiard, B., and Lill, R. (1997) The ABC transporter Atm1p is required for mitochondrial iron homeostasis. *FEBS Letters*, **418**, 346–350.
- Kispal, G., Csere, P., Prohl, C., and Lill, R. (1999) The mitochondrial proteins Atm1p and Nfs1p are essential for biogenesis of cytosolic Fe/S proteins. *The EMBO Journal*, **18**, 3981–3989.
- Kitada, K., Yamaguchi, E., Hamada, K., and Arisawa, M. (1997) Structural analysis of a *Candida glabrata* centromere and its functional homology to the *Saccharomyces cerevisiae* centromere. *Current Genetics*, **31**, 122–127.
- Kjeldsen, T. (2000) Yeast secretory expression of insulin precursors. *Applied Microbiology and Biotechnology*, **54**, 277–286.
- Klabunde, J., Kunze, G., Gellissen, G., and Hollenberg, C.P. (2003) Integration of heterologous genes in several yeast species using vectors containing a *Hansenula polymorpha*-derived rDNA-targeting element. *FEMS Yeast Research*, **4**, 185–193.
- Kladde, M.P., Xu, M., and Simpson, R.T. (1999) DNA methyltransferases as probes for chromatin structure in yeast. *Methods in Molecular Biology (Clifton, NJ)*, **119**, 395–416 (review).
- Kleinschmidt, J.A., Escher, C., and Wolf, D.H. (1988) Proteinase yscE of yeast shows homology with the 20S cylinder particles of *Xenopus laevis*. *FEBS Letters*, **239**, 35–40.
- Klevecz, R.R., Li, C.M., Marcus, I., and Frankel, P.H. (2006) Collective behaviour in gene regulation: the cell is an oscillator, the cell cycle a developmental process. *FEBS Journal*, **275**, 2372–2384.
- Klinner, U., Fluthgraf, S., Freese, S., and Passoth, V. (2005) Aerobic induction of respiro-fermentative growth by decreasing oxygen tensions in the respiratory yeast *Pichia stipitis*. *Applied Microbiology and Biotechnology*, **67**, 247–253.
- Klionsky, D.J. and Ohsumi, Y. (1999) Vacuolar import of proteins and organelles from the cytoplasm. *Annual Review of Cell and Developmental Biology*, **15**, 1–32 (review).
- Klionsky, D.J. (2007) Autophagy: from phenomenology to molecular understanding in less than a decade. *Nature Reviews Molecular Cell Biology*, **8**, 931–937.
- Klis, F.M. (1994) Review: cell wall assembly in yeast. *Yeast (Chichester, England)*, **10**, 851–869 (review).
- Klopf, E., Paskova, L., Solé, C. *et al.* (2009) Cooperation between the INO80 complex and histone chaperones determines adaptation of stress gene transcription in the yeast *Saccharomyces cerevisiae*. *Molecular and Cellular Biology*, **29**, 4994–5007.
- Knight, S.A., Sepuri, N.B., Pain, D., and Dancis, A. (1998) Mt-Hsp70 homolog, Ssc2p, required for maturation of yeast frataxin and mitochondrial iron homeostasis. *The Journal of Biological Chemistry*, **273**, 18389–18393.
- Künkele, K.P., Heins, S., Dembowski, M. *et al.* (1998) The preprotein translocation channel of the outer membrane of mitochondria. *Cell*, **93**, 1009–1019.
- Knodler, A., Konrad, G., and Mayinger, P. (2008) Expression of yeast lipid phosphatase Sac1p is regulated by phosphatidylinositol-4-phosphate. *BMC Molecular Biology*, **9**, 16.
- Knop, M., Schiffer, H.H., Rupp, S., and Wolf, D. H. (1993) Vacuolar/lysosomal proteolysis: proteases, substrates, mechanisms. *Current Opinion in Cell Biology*, **5**, 990–996 (review).
- Knop, M. (2006) Evolution of the Hemiascomycete yeasts: on life styles and the importance of inbreeding. *Bioessays*, **28**, 696–708.
- Knop, M. (2011) Yeast cell morphology and sexual reproduction – a short overview and some considerations. *Comptes Rendus Biologies*, **334**, 599–606.

- Kobor, M.S., Archambault, J., Lester, W. *et al.* (1999) An unusual eukaryotic protein phosphatase required for transcription by RNA polymerase II and CTD dephosphorylation in *S. cerevisiae*. *Molecular Cell*, **4**, 55–62.
- Kobor, M.S., Venkatasubrahmanyam, S., Meneghini, M.D. *et al.* (2004) A protein complex containing the conserved Swi2/Snf2-related ATPase Swr1p deposits histone variant H2A.Z into euchromatin. *PLoS Biology*, **2**, E131.
- Koehler, C.M., Merchant, S., Oppliger, W. *et al.* (1998) Tim9p, an essential partner subunit of Tim10p for the import of mitochondrial carrier proteins. *The EMBO Journal*, **17**, 6477–6486.
- Koehler, C.M., Merchant, S., and Schatz, G. (1999) How membrane proteins travel across the mitochondrial intermembrane space. *Trends in Biochemical Sciences*, **24**, 428–432 (review).
- Koehler, C.M., Murphy, M.P., Bally, N.A. *et al.* (2000) Tim18p, a new subunit of the TIM22 complex that mediates insertion of imported proteins into the yeast mitochondrial inner membrane. *Molecular and Cellular Biology*, **20**, 1187–1193.
- Koepp, D.M. and Silver, P.A. (1996) A GTPase controlling nuclear trafficking: running the right way or walking RANDOMly? *Cell*, **87**, 1–4.
- Koerber, R.T., Rhee, H.S., Jiang, C., and Pugh, B.F. (2009) Interaction of transcriptional regulators with specific nucleosomes across the *Saccharomyces cerevisiae* genome. *Molecular Cell*, **35**, 889–902.
- Koh, S.S., Ansari, A.Z., Ptashne, M., and Young, R.A. (1998) An activator target in the RNA polymerase II holoenzyme. *Molecular Cell*, **1**, 895–904.
- Kohler, A. and Hurt, E. (2007) Exporting RNA from the nucleus to the cytoplasm. *Nature Reviews Molecular Cell Biology*, **8**, 761–773.
- Kohler, A., Cascio, P., Leggett, D.S., Woo, K.M., Goldberg, A.L., and Finley, D. (2001) The axial channel of the proteasome core particle is gated by the Rpt2 ATPase and controls both substrate entry and product release. *Molecular Cell*, **7**, 1143–1152.
- Köhler, A., Pascual-García, P., Llopis, A., Zapatero, M., Posas, F., Hurt, E., and Rodríguez-Navarro, S. (2006) The mRNA export factor Sus1 is involved in Spt/Ada/Gcn5 acetyltransferase-mediated H2B deubiquitinylation through its interaction with Ubp8 and Sgf11. *Molecular Biology of the Cell*, **17**, 4228–4236.
- Kohlwein, S.D., Daum, G., Schneider, R., and Paltauf, F. (1996) Phospholipids: synthesis, sorting, subcellular traffic – the yeast approach. *Trends in Cell Biology*, **6**, 260–266.
- Kokoska, R.J., Stefanovic, L., Tran, H.T., Resnick, M.A., Gordenin, D.A., and Petes, T. D. (1998) Destabilization of yeast micro- and minisatellite DNA sequences by mutations affecting a nuclease involved in Okazaki fragment processing (*rad27*) and DNA polymerase delta (*pol3+*). *Molecular and Cellular Biology*, **18**, 2779–2788.
- Kolaczowska, A., Kolaczowski, M., Delahodde, A., and Goffeau, A. (2002) Functional dissection of Pdr1p, a regulator of multidrug resistance in *Saccharomyces cerevisiae*. *Molecular Genetics and Genomics*, **267**, 96–106.
- Koleske, A.J. and Young, R.A. (1994) An RNA polymerase II holoenzyme responsive to activators. *Nature*, **368**, 466–469.
- Koleske, A.J., Buratowski, S., Nonet, M., and Young, R.A. (1992) A novel transcription factor reveals a functional link between the RNA polymerase II CTD and TFIID. *Cell*, **69**, 883–894.
- Kolitz, S.E. and Lorsch, J.R. (2010) Eukaryotic initiator tRNA: finely tuned and ready for action. *FEBS Letters*, **584**, 396–404.
- Kolling, R. and Hollenberg, C.P. (1994) The ABC-transporter Ste6 accumulates in the plasma membrane in a ubiquitinated form in endocytosis mutants. *The EMBO Journal*, **13**, 3261–3271.
- Kolling, R. and Losko, S. (1997) The linker region of the ABC-transporter Ste6 mediates ubiquitination and fast turnover of the protein. *The EMBO Journal*, **16**, 2251–2261.
- Komachi, K., Redd, M.J., and Johnson, A.D. (1994) The WD repeats of Tup1 interact with the homeodomain of alpha2. *Genes and Development*, **8**, 2857–2867.
- Komiya, T., Rospert, S., Schatz, G., and Mihara, K. (1997) Binding of mitochondrial precursor proteins to the cytoplasmic domains of the import receptors Tom70 and Tom20 is determined by cytoplasmic chaperones. *The EMBO Journal*, **16**, 4267–4275.
- Konarska, M.M. and Sharp, P.A. (1987) Interactions between small nuclear ribonucleoprotein particles in formation of spliceosomes. *Cell*, **49**, 763–774.
- Konarska, M.M., Grabowski, P.J., Padgett, R.A., and Sharp, P.A. (1985) Characterization of the branch site in lariat RNAs produced by splicing of mRNA precursors. *Nature*, **313**, 552–557.
- Kondo, A. and Ueda, M. (2004) Yeast cell-surface display – applications of molecular display. *Applied Microbiology and Biotechnology*, **64**, 28–40.
- Kondo, H., Rabouille, C., Newman, R. *et al.* (1997) p47 is a cofactor for p97-mediated membrane fusion. *Nature*, **388**, 75–78.
- Kondo, A., Shigechi H, Abe M, Uyama K, Matsumoto T, Takahashi S, Ueda M, Tanaka A, Kishimoto M, Fukuda H. (2002) High-level ethanol production from starch by a flocculent *Saccharomyces cerevisiae* strain displaying cell-surface glucoamylase. *Applied Microbiology and Biotechnology*, **2002**, 291–296.
- Konig, P. and Richmond, T.J. (1993) The X-ray structure of the GCN4-bZIP bound to ATF/CREB site DNA shows the complex depends on DNA flexibility. *Journal of Molecular Biology*, **233**, 139–154.
- Kooistra, R., Hooykaas, P.J.J., and Steensma, H. Y. (2004) Efficient gene targeting in *Kluyveromyces fragilis*. *Yeast (Chichester, England)*, **21**, 781–792.
- Koonin, E.V., Wolf, Y.I., and Aravind, L. (2001) Prediction of the archaeal exosome and its connections with the proteasome and the translation and transcription machineries by a comparative-genomic approach. *Genome Research*, **11**, 240–252.
- Korbel, D., Wurth, S., Kaser, M., and Langer, T. (2004) Membrane protein turnover by the m-AAA protease in mitochondria depends on the transmembrane domains of its subunits. *EMBO Reports*, **5**, 698–703.
- Korber, P. and Becker, P.B. (2010) Nucleosome dynamics and epigenetic stability. *Essays in Biochemistry*, **48**, 63–74.
- Kornberg, R.D. and Lorch, Y. (1992) Chromatin structure and transcription. *Annual Review of Cell Biology*, **8**, 563–587 (review).
- Kornberg, R.D. and Lorch, Y. (1995) Interplay between chromatin structure and transcription. *Current Opinion in Cell Biology*, **7**, 371–375 (review).
- Kornberg, R.D. and Lorch, Y. (1999) Twenty-five years of the nucleosome, fundamental particle of the eukaryote chromosome. *Cell*, **98**, 285–294 (review).
- Kornberg, R. (2006) *Molecular basis of transcription*. Nobel Lecture, http://nobelprize.org/nobel_prizes/chemistry/laureates/2006/kornberg-lecture.html.
- Koshland, D. and Hartwell, L.H. (1987) The structure of sister minichromosome DNA before anaphase in *Saccharomyces cerevisiae*. *Science*, **238**, 1713–1736.
- Koski, R.A., Clarkson, S.G., Kurjan, J., Hall, B. D., and Smith, M. (1980) Mutations at the yeast SUP4 tRNATyr locus; transcription of the mutant genes *in vitro*. *Cell*, **22**, 415–425.
- Kosman, D.J. (2003) Molecular mechanisms of iron uptake in fungi. *Molecular Microbiology*, **47**, 1185–1197.
- Kostelansky, M.S., Schluter, C., Tam, Y.Y. *et al.* (2007) Molecular architecture and functional model of the complete yeast ESCRT-I heterotetramer. *Cell*, **129**, 485–498.
- Kostova, Z. and Wolf, D.H. (2003) For whom the bell tolls: protein quality control of the endoplasmic reticulum and the ubiquitin–proteasome connection. *The EMBO Journal*, **22**, 2309–2317.
- Kostriken, R., Strathern, J.N., Klar, A.J., Hicks, J.B., and Heffron, F. (1983) A site-specific endonuclease essential for mating type switching in *Saccharomyces cerevisiae*. *Cell*, **35**, 167–174.
- Kozul, R. and Fischer, G. (2009) A prominent role for segmental duplications in modeling eukaryotic genomes. *Comptes Rendus Biologies*, **332**, 254–266.
- Kozul, R., Caburet, S., Dujon, B., and Fischer, G. (2004) Eukaryotic genome evolution through the spontaneous duplication of large chromosomal segments. *The EMBO Journal*, **23**, 234–243.
- Kozul, R., Dujon, B., and Fischer, G. (2006) Stability of large segmental duplications in the yeast genome. *Genetics*, **172**, 2211–2222.
- Kotani, T., Zhang, X., Schiltz, R.L. *et al.* (1998) TBP-associated factors in the PCAF histone acetylase complex. *Cold Spring Harbor Symposia on Quantitative Biology*, **63**, 493–499 (review).
- Koufopanou, V., Hughes, J., Bell, G., and Burt, A. (2006) The spatial scale of genetic differentiation in a model organism, the wild yeast *Saccharomyces paradoxus*. *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences*, **361**, 1941–1946.
- Kovac, L., Lachowicz, T.M., and Slonimski, P.P. (1967) Biochemical genetics of oxidative phosphorylation. *Science*, **158**, 1564–1567.
- Kovermann, P., Truscott, K.N., Guiard, B. *et al.* (2002) Tim22, the essential core of the mitochondrial protein insertion complex, forms a voltage-activated and signal-gated channel. *Molecular Cell*, **9**, 363–373.
- Kozjak, V., Wiedemann, N., Milenkovic, D. *et al.* (2003) An essential role of Sam50 in the protein sorting and assembly machinery of the mitochondrial outer membrane. *The Journal of Biological Chemistry*, **278**, 48520–48523.
- Krahulec, S., Petschacher, B., Wallner, M., Longus, K., Klimacek, M., and Nidetzky, B.

- (2010) Fermentation of mixed glucose–xylose substrates by engineered strains of *Saccharomyces cerevisiae*: role of the coenzyme specificity of xylose reductase, and effect of glucose on xylose utilization. *Microbial Cell Factories*, **9**, 16.
- Krainer, A.R., Maniatis, T., Ruskin, B., and Green, M.R. (1984) Excision of an intact intron as a novel lariat structure during pre-mRNA splicing *in vitro*. *Cell*, **36**, 993–1005.
- Kramara, J., Willcox, S., Gunisova, S. *et al.* (2010) Tay1 protein, a novel telomere binding factor from *Yarrowia lipolytica*. *The Journal of Biological Chemistry*, **285**, 38078–38092.
- Kreft, S.G., Lin Wang, L., and Hochstrasser, M. (2006) Membrane topology of the yeast endoplasmic reticulum-localized ubiquitin ligase Doa10 and comparison with its human ortholog TEB4 (MARCH-VI). *The Journal of Biological Chemistry*, **281**, 4646–4653.
- Kren, A., Mamnun, Y.M., Bauer, B.E. *et al.* (2003) War1p, a novel transcription factor controlling weak acid stress response in yeast. *Molecular and Cellular Biology*, **23**, 1775–1785.
- Krieg, R., Stucka, R., Clark, S., and Feldmann, H. (1991) The use of a synthetic tRNA gene as a novel approach to study *in vivo* transcription and chromatin structure in yeast. *Nucleic Acids Research*, **19**, 3849–3855.
- Krimmer, T., Rapaport, D., Ryan, M.T. *et al.* (2001) Biogenesis of porin of the outer mitochondrial membrane involves an import pathway via receptors and the general import pore of the TOM complex. *The Journal of Cell Biology*, **152**, 289–300.
- Krivoruchko, A., Siewers, V., and Nielsen, J. (2011) Opportunities for yeast metabolic engineering: lessons from synthetic biology. *Journal of Biotechnology*, **6**, 262–276 (review).
- Krogan, N.J., Kim, M., Ahn, S.H. *et al.* (2002) RNA polymerase II elongation factors of *Saccharomyces cerevisiae*: a targeted proteomics approach. *Molecular and Cellular Biology*, **22**, 6979–6992.
- Krogan, N.J., Keogh, M.C., Datta, N. *et al.* (2003) A Snf2 family ATPase complex required for recruitment of the histone H2A variant Htz1. *Molecular Cell*, **12**, 1565–1576.
- Krogan, N.J., Cagney, G., Yu, H. *et al.* (2006) Global landscape of protein complexes in the yeast *Saccharomyces cerevisiae*. *Nature*, **440**, 637–643.
- Kron, S.J., Styles, C.A., and Fink, G.R. (1994) Symmetric cell division in pseudohyphae of the yeast *Saccharomyces cerevisiae*. *Molecular Biology of the Cell*, **5**, 1003–1022.
- Kronidou, N.G., Oppliger, W., Bolliger, L. *et al.* (1994) Dynamic interaction between Isp45 and mitochondrial hsp70 in the protein import system of the yeast mitochondrial inner membrane. *Proceedings of the National Academy of Sciences of the United States of America*, **91**, 12818–12822.
- Krysan, D.J., Ting, E.L., Abeijon, C., Kroos, L., and Fuller, R.S. (2005) Yapsins are a family of aspartyl proteases required for cell wall integrity in *Saccharomyces cerevisiae*. *Eukaryotic Cell*, **4**, 1364–1374.
- Kuberl, A., Schneider, J., Thallinger, G.G. *et al.* (2011) High-quality genome sequence of *Pichia pastoris* CBS7435. *Journal of Biotechnology*, **154**, 312–320.
- Kubota, Y., Takase, Y., Komori, Y. *et al.* (2003) A novel ring-like complex of *Xenopus* proteins essential for the initiation of DNA replication. *Genes and Development*, **17**, 1141–1152.
- Kuehn, M.J., and Schekman, R. (1997) COPII and secretory cargo capture into transport vesicles. *Current Opinion in Cell Biology*, **9**, 477–483 (review).
- Kuehn, M.J., Herrmann, J.M., and Schekman, R. (1998) COPII–cargo interactions direct protein sorting into ER-derived transport vesicles. *Nature*, **391**, 187–190.
- Kuehne, H.A., Murphy, H.A., Francis, C.A., and Sniegowski, P.D. (2007) Allopatric divergence, secondary contact, and genetic isolation in wild yeast populations. *Current Biology*, **17**, 407–411.
- Kueng, S., Hegemann, B., Peters, B.H. *et al.* (2006) Wapl controls the dynamic association of cohesin with chromatin. *Cell*, **127**, 955–967.
- Kuge, S. and Jones, N. (1994) YAP1 dependent activation of TRX2 is essential for the response of *Saccharomyces cerevisiae* to oxidative stress by hydroperoxides. *The EMBO Journal*, **13**, 655–664.
- Kuhn, K.M., DeRisi, J.L., Brown, P.O., and Sarnow, P. (2001) Global and specific translational regulation in the genomic response of *Saccharomyces cerevisiae* to a rapid transfer from a fermentable to a nonfermentable carbon source. *Molecular and Cellular Biology*, **21**, 916–927.
- Kuhne, C. and Linder, P. (1993) A new pair of B-type cyclins from *Saccharomyces cerevisiae* that function early in the cell cycle. *The EMBO Journal*, **12**, 3437–3447.
- Kumanovics, A., Chen, O.S., Li, L. *et al.* (2008) Identification of FRA1 and FRA2 as genes involved in regulating the yeast iron regulon in response to decreased mitochondrial iron–sulfur cluster synthesis. *The Journal of Biological Chemistry*, **283**, 10276–10286.
- Kumar, R., Reynolds, D.M., Shevchenko, A., Shevchenko, A., Goldstone, S.D., and Dalton, S. (2000) Forkhead transcription factors, Fkh1p and Fkh2p, collaborate with Mcm1p to control transcription required for M-phase. *Current Biology*, **10**, 896–906.
- Kumar, A., Cheung, K.-H., Tosches, N. *et al.* (2002) The TRIPLES database: a community resource for yeast molecular biology. *Nucleic Acids Research*, **30**, 73–75.
- Kunau, W.H., Böhne, S., de la Garza, M.M. *et al.* (1988) Comparative enzymology of β -oxidation. *Biochemical Society Transactions*, **16**, 418–420.
- Kung, L.A. and Snyder, M. (2006) Proteome chips for whole-organism assays. *Nature Reviews Molecular Cell Biology*, **7**, 617–622 (review).
- Kuo, M. and Grayhack, E. (1994) A library of yeast genomic MCM1 binding sites contains genes involved in cell cycle control, cell wall and membrane structure, and metabolism. *Molecular and Cellular Biology*, **14**, 348–359.
- Kuo, D., Licon, K., Bandyopadhyay, S. *et al.* (2010a) Coevolution within a transcriptional network by compensatory *trans* and *cis* mutations. *Genome Research*, **20**, 1672–1678.
- Kuo, D., Tan, K., Zinman, G., Ravasi, T., Bar-Joseph, Z., and Ideker, T. (2010b) Evolutionary divergence in the fungal response to fluconazole revealed by soft clustering. *Genome Biology*, **11**, R77.
- Kuras, L., Borggreffe, T., and Kornberg, R.D. (2003) Association of the mediator complex with enhancers of active genes. *Proceedings of the National Academy of Sciences of the United States of America*, **100**, 13887–13891.
- Kurdistani, S.K. and Grunstein, M. (2003) Histone acetylation and deacetylation in yeast. *Nature Reviews Molecular Cell Biology*, **4**, 276–284 (review).
- Kurjan, J. and Herskowitz, I. (1982) Structure of a yeast pheromone gene (MF alpha): apurative alpha-factor precursor contains four tandem copies of mature alpha-factor. *Cell*, **30**, 933–943.
- Kurjan, J., Hall, B.D., Gillam, S., and Smith, M. (1980) Mutations at the yeast *SUP4* tRNA^{Tyr} locus: DNA sequence changes in mutants lacking suppressor activity. *Cell*, **20**, 701–709.
- Kuroda, K. and Ueda, M. (2011) Cell surface engineering of yeast for applications in white biotechnology. *Biotechnology Letters*, **33**, 1–9 (review).
- Kuroda, K., Kobayashi, K., Tsumura, H., Komeda, T., Chiba, Y., and Jigami, Y. (2006) Production of Man5GlcNAc2-type sugar chain by the methylotrophic yeast *Ogataea minuta*. *FEMS Yeast Research*, **6**, 1052–1062.
- Kurtz, S. and Shore, D. (1991) RAP1 protein activates and silences transcription of mating-type genes in yeast. *Genes and Development*, **5**, 616–628.
- Kurtzman, C.P. and Fell, J.W. (2000) *The Yeasts: A Taxonomic Study*, Elsevier, Amsterdam.
- Kurtzman, C.P. and Robnett, C.J. (2003) Phylogenetic relationships among yeasts of the “*Saccharomyces* complex” determined from multigene sequence analyses. *FEMS Yeast Research*, **3**, 417–432.
- Kurtzman, C.P. and Robnett, C.J. (2007) Multigene phylogenetic analysis of the *Trichomonascus*, *Wickerhamiella* and *Zygoascus* yeast clades, and the proposal of *Sugiyamaella* gen. nov. and 14 new species combinations. *FEMS Yeast Research*, **7**, 141–151.
- Kurtzman, C.P., Fell, W., and Boekshout, T. (eds) (2011) *The Yeasts: A Taxonomic Study*, 4th edn, Elsevier, Amsterdam.
- Kurtzman, C.P., Fell, W., and Boekshout, T. (eds.) *The yeasts, fifth edition: a taxonomic study*, Elsevier, Amsterdam, 2011.
- Kurtzman, C.P. (2003) Phylogenetic circumscription of *Saccharomyces*, *Kluyveromyces* and other members of the *Saccharomycetaceae*, and the proposal of the new genera *Lachancea*, *Nakaseomyces*, *Naumovia*, *Vanderwaltozyma* and *Zygotorulaspota*. *FEMS Yeast Research*, **4**, 233–245.
- Kurtzman, C.P. (2005) Description of *Komagataella phaffii* sp. nov. and the transfer of *Pichia pseudopastoris* to the methylotrophic yeast genus *Komagataella*. *International Journal of Systematic and Evolutionary Microbiology*, **55**, 973–976.
- Kurtzman, C.P. (2009) Biotechnological strains of *Komagataella* (*Pichia*) *pastoris* are *Komagataella phaffii* as determined from multigene sequence analysis. *Journal of Industrial Microbiology & Biotechnology*, **36**, 1435–1438.
- Kurtzman, C.P. (2011a) Summary of species characteristics, in *The Yeasts: A Taxonomic Study*, vol. 2 (eds C.P. Kurtzman, J.W. Fell,

- and T. Boekhout), Elsevier, Amsterdam, pp. 224–277.
- Kurtzman, C.P. (2011b) *Yarrowia van der Walt*, and von Arx – 1980 in *The Yeasts: A Taxonomic Study*, vol. 2 (eds C.P. Kurtzman, J.W. Fell, and T. Boekhout), Elsevier, Amsterdam, pp. 927–929.
- Kurtzman, C.P. (2011c) Scheffersomyces Kurtzman, and M. Suzuki – 2010, in *The Yeasts: A Taxonomic Study*, vol. 2 (eds C.P. Kurtzman, J.W. Fell, and T. Boekhout), Elsevier, Amsterdam, pp. 775–784.
- Kurz, T., Ozliü, N., Rudolf, F. *et al.* (2005) The conserved protein Dcn1/Dcn1p is required for cullin neddylation in *C. elegans* and *S. cerevisiae*. *Nature*, **435**, 1257–1261.
- Kurz, T., Chou, Y.C., Willems, A.R. *et al.* (2008) Dcn1 functions as a scaffold-type E3 ligase for cullin neddylation. *Molecular Cell*, **29**, 23–35.
- Kutty, S.N. and Philip, R. (2008) Marine yeasts – a review. *Yeast (Chichester, England)*, **25**, 465–483.
- Kwon, Y.T., Reiss, Y., Fried, V.A. *et al.* (1998) The mouse and human genes encoding the recognition component of the N-end rule pathway. *Proceedings of the National Academy of Sciences of the United States of America*, **95**, 7898–7903.
- Labib, K., Tercero, J.A., and Diffley, J.F. (2000) Uninterrupted MCM2–7 function required for DNA replication fork progression. *Science*, **288**, 1643–1647.
- Labouesse, M., Dujardin, G., and Slonimski, P. P. (1985) The yeast nuclear gene *NAM2* is essential for mitochondrial DNA integrity and can cure a mitochondrial RNA-maturase deficiency. *Cell*, **41**, 133–143.
- Lachance, M.A. (2011) Kluyveromyces van der Walt (1971), in *The Yeasts: A Taxonomic Study*, vol. 2 (eds C.P. Kurtzman, J.W. Fell, and T. Boekhout), Elsevier, Amsterdam, pp. 471–477.
- Lacroute, F. (1971) Non-Mendelian mutation allowing ureidosuccinic acid uptake in yeast. *Journal of Bacteriology*, **106**, 519–522.
- Lafontaine, I. and Dujon, B. (2010) Origin and fate of pseudogenes in Hemiascomycetes: a comparative analysis. *BMC Genomics*, **11**, 260.
- Lafontaine, I., Fischer, G., Talla, E., and Dujon, B. (2004) Gene relics in the genome of the yeast *Saccharomyces cerevisiae*. *Genetics*, **335**, 1–17.
- Lafuente, M.J., Gancedo, C., Jauniaux, J.C., and Gancedo, M. (2000) Mth1 receives the signal given by the glucose sensors Snf3 and Rgt2 in *Saccharomyces cerevisiae*. *Molecular Microbiology*, **35**, 161–172.
- Lahaye, A., Stahl, H., Thines-Sempoux, D., and Foury, F. (1991) PIF1: a DNA helicase in yeast mitochondria. *The EMBO Journal*, **10**, 997–1007.
- Laloux, I., Dubois, E., Dewerchin, M., and Jacobs, E. (1990) *TEC1*, a gene involved in the activation of Ty1 and Ty1-mediated gene expression in *Saccharomyces cerevisiae*: cloning and molecular analysis. *Molecular and Cellular Biology*, **10**, 3541–3550.
- Lam, M.H., Urban-Grimal, D., Bugnicourt, A. *et al.* (2009) Interaction of the deubiquitinating enzyme Ubp2 and the E3 ligase Rsp5 is required for transporter/receptor sorting in the multivesicular body pathway. *PLoS One*, **4**, e4259.
- Lammer, D., Mathias, N., Laplaza, J.M. *et al.* (1998) Modification of yeast Cdc53p by the ubiquitin-related protein rub1p affects function of the SCFCdc4 complex. *Genes and Development*, **12**, 914–926.
- Lang, G.L. and Murray, A.W. (2008) Estimating the per-base mutation rate in the yeast *Saccharomyces cerevisiae*. *Genetics*, **178**, 67–82.
- Lang, W.H., Morrow, B.E., Ju, Q., Warner, J.R., and Reeder, R.H. (1994) A model for transcription termination by RNA polymerase I. *Cell*, **79**, 527–534.
- Lange, N. and Steinbüchel, A. (2011) β -Carotene production by *Saccharomyces cerevisiae* with regard to plasmid stability and culture media. *Applied Microbiology and Biotechnology*, **91**, 1611–1622.
- Lange, H., Kaut, A., Kispal, G., and Lill, R. (2000) A mitochondrial ferredoxin is essential for biogenesis of cellular iron–sulfur proteins. *Proceedings of the National Academy of Sciences of the United States of America*, **97**, 1050–1055.
- Lange, H., Lisowsky, T., Gerber, J., Muhlenhoff, U., Kispal, G., and Lill, R. (2001) An essential function of the mitochondrial sulphydryl oxidase Erv1p/ALR in the maturation of cytosolic Fe/S proteins. *EMBO Reports*, **2**, 715–720.
- Langer, T., Kaser, M., Klanner, C., and Leonhard, K. (2001) AAA proteases of mitochondria: quality control of membrane proteins and regulatory functions during mitochondrial biogenesis. *Biochemical Society Transactions*, **29**, 431–436.
- Langer, T. (2000) AAA proteases: cellular machines for degrading membrane proteins. *Trends in Biochemical Sciences*, **25**, 247–251.
- Langford, C.J. and Gallwitz, D. (1983) Evidence for an intron-contained sequence required for the splicing of yeast RNA polymerase II transcripts. *Cell*, **33**, 519–527.
- Langford, C.J., Klinz, F.J., Donath, C., and Gallwitz, D. (1984) Point mutations identify the conserved, intron-contained TACTAAC box as an essential splicing signal sequence in yeast. *Cell*, **36**, 645–653.
- Laplante, M. and Sabatini, D.M. (2009) An Emerging Role of mTOR in Lipid Biosynthesis. *Curr. Biol.* **19**, 1046–1052.
- Laplaza, J.M., Bostick, M., Scholes, D.T., Curcio, M.J., and Callis, J. (2004) *Saccharomyces cerevisiae* ubiquitin-like protein Rub1 conjugates to cullin proteins Rtt101 and Cul3 *in vivo*. *The Biochemical Journal*, **377**, 459–467.
- Laplaza, J.M., Torres, B.R., Jin, Y.S., and Jeffries, T.W. (2006) Sh ble and Cre adapted for functional genomics and metabolic engineering of *Pichia stipitis*. *Enzyme and Microbial Technology*, **38**, 741–747.
- Lardenois, A., Liua, Y., Walther, T. *et al.* (2011) Execution of the meiotic noncoding RNA expression program and the onset of gametogenesis in yeast require the conserved exosome subunit Rrp6. *Proceedings of the National Academy of Sciences of the United States of America*, **108**, 1058–1063.
- Larionov, V.L., Kouprina, N., and Karpova, T. (1984) Stability of recombinant plasmids containing the ARS sequence of yeast extrachromosomal rDNA in several strains of *Saccharomyces cerevisiae*. *Genetics*, **28**, 229–235.
- Larson, G.P., Castanotto, D., Rossi, J.J., and Malafa, M.P. (1994) Isolation and functional analysis of a *Kluyveromyces lactis* RAP1 homologue. *Genetics*, **150**, 35–41.
- Larson, D.R., Zenklusen, D., Wu, B., Chao, J.A., and Singer, R.H. (2011) Real-time observation of transcription initiation and elongation on an endogenous yeast gene. *Science*, **332**, 475–478.
- Lartigue, C., Vashee, S., Algire, M. *et al.* (2009) Creating bacterial strains from genomes that have been cloned and engineered in yeast. *Science*, **325**, 1693–1696.
- Lashkari, D.A., DeRisi, J.L., McCusker, J.H. *et al.* (1997) Yeast microarrays for genome wide parallel genetic and gene expression analysis. *Proceedings of the National Academy of Sciences of the United States of America*, **94**, 13057–13062.
- Lasserre, J.P., Nicaud, J.M., Pagot, Y., Joubert-Caron, R., Caron, M., and Hardouin, J. (2010) First complexomic study of alkane-binding protein complexes in the yeast *Yarrowia lipolytica*. *Talanta*, **80**, 1576–1585.
- Latterich, M. and Schekman, R. (1994) The karyogamy gene *KAR2* and novel proteins are required for ER-membrane fusion. *Cell*, **78**, 87–98.
- Latterich, M., Frohlich, K.U., and Schekman, R. (1995) Membrane fusion and the cell cycle: Cdc48p participates in the fusion of ER membranes. *Cell*, **82**, 885–893.
- Laurent, B.C., Benton, B.K., Kladden, M.P., and Laurent, B.C. (1992) An essential *Saccharomyces cerevisiae* gene homologous to SNF2 encodes a helicase-related protein in a new family. *Molecular and Cellular Biology*, **12**, 1893–902.
- Lauwers, E. and Andre, B. (2006) Association of yeast transporters with detergent-resistant membranes correlates with their cell-surface location. *Traffic (Copenhagen, Denmark)*, **7**, 1045–1059.
- Lavoie, B.D., Hogan, E., and Koshland, D. (2002) *In vivo* dissection of the chromosome condensation machinery: reversibility of condensation distinguishes contributions of condensin and cohesin. *The Journal of Cell Biology*, **156**, 805–815.
- Lavoie, H., Hogues, H., Mallick, J., Sellam, A., Nantel, A., and Whiteway, M. (2010) Evolutionary tinkering with conserved components of a transcriptional regulatory network. *PLoS Biology*, **8**, e1000329.
- Lawrence, D.S. (2001) Functional proteomics: large-scale analysis of protein kinase activity. *Genome Biology*, **2** (2): REVIEWS1007.
- Laxman, S., Sutter, B.M., and Tu, B.P. (2010) Behavior of a metabolic cycling population at the single cell level as visualized by fluorescent gene expression reporters. *PLoS One*, **5**, e12595.
- Layer, J.H., Miller, S.G., and Weil, P.A. (2010) Direct transactivator-transcription factor IID (TFIID) contacts drive yeast ribosomal protein gene transcription. *The Journal of Biological Chemistry*, **285**, 15489–15499.
- Lazar, T., Gotte, M., and Gallwitz, D. (1997) Vesicular transport: how many Ypt/Rab-GTPases make a eukaryotic cell? *Trends in Biochemical Sciences*, **22**, 468–472 (review).
- Lazarow, P.B. and Fujiki, Y. (1985) Biogenesis of peroxisomes. *Annual Review of Cell Biology*, **1**, 489–530.
- Lazowska, J., Jacq, C., and Slonimski, P.P. (1980) Sequence of introns and flanking exons in wild-type and box 3 mutants of

- cytochrome *b* reveals an interlaced splicing protein coded by an intron. *Cell*, **22**, 333–348.
- Le Dall, M.T., Nicaud, J.M., and Gaillardin, C. (1994) Multiple-copy integration in the yeast *Yarrowia lipolytica*. *Current Genetics*, **26**, 38–44.
- Lelandais, G., Tanty, V., Geneix, C., Etchebest, C., Jacq, C., and Devaux, F. (2008) Genome adaptation to chemical stress, clues from comparative transcriptomics in *Saccharomyces cerevisiae* and *Candida glabrata*. *Genome Biology*, **9**, R164.
- Lechner, J. and Ortiz, J. (1996) The *S. cerevisiae* kinetochore. *FEBS Letters*, **389**, 70–74.
- Lecrenier, N., Van Der Bruggen, P., and Foury, F. (1997) Mitochondrial DNA polymerases from yeast to man: a new family of polymerases. *Genetics*, **185**, 147–152.
- Leder, P., Tiemeier, D., and Enquist, L. (1977) EK2 derivatives of bacteriophage lambda useful in the cloning of DNA from higher organisms: the lambda gtWES system. *Science*, **196**, 175–157.
- Lee, M.C.S. and Miller, E.A. (2007) Molecular mechanisms of COPII vesicle formation. *Seminars in Cell and Developmental Biology*, **18**, 424–434.
- Lee, M.G. and Nurse, P. (1987) Complementation used to clone a human homologue of the fission yeast cell cycle control gene *cdc2*. *Nature*, **327**, 31–35.
- Lee, D., Horikoshi, M., and Roeder, R.G. (1991a) Interaction of TFIID in the minor groove of the TATA element. *Cell*, **7**, 1241–1250.
- Lee, J.Y., Rohlman, C.E., Molony, L.A., and Engelke, D.R. (1991b) Characterization of *RPR1*, an essential gene encoding the RNA component of *Saccharomyces cerevisiae* nuclear RNase P. *Molecular and Cellular Biology*, **11**, 721–730.
- Lee, K.K., Prochasson, P., Florens, L., Swanson, S.K., Washburn, M.P., Workman, J.L. (2004) Proteomic analysis of chromatin-modifying complexes in *Saccharomyces cerevisiae* identifies novel subunits. *Biochemical Society Transactions*, **32**, 899–903.
- Lee, T.I., Wyrick, J.J., Koh, S.S., Jennings, E. G., Gadbois, E.L., and Young, R.A. (1998) Interplay of positive and negative regulators in transcription initiation by RNA polymerase II holoenzyme. *Mol. Cell. Biol.*, **18**, 4455–4462.
- Lee, G.W., Melchior, F., Matunis, M.J., Mahajan, R., Tian, Q., and Anderson, P. (1998a) Modification of Ran GTPase-activating protein by the small ubiquitin-related modifier SUMO-1 requires Ubc9, an E2-type ubiquitin-conjugating enzyme homologue. *The Journal of Biological Chemistry*, **273**, 6503–6507.
- Lee, T.I., Wyrick, J.J., Koh, S.S., Jennings, E.G., Gadbois, E.L., and Young, R.A. (1998b) Interplay of positive and negative regulators in transcription initiation by RNA polymerase II holoenzyme. *Molecular and Cellular Biology*, **18**, 4455–4462.
- Lee, T.I., Causton, H.C., Holstege, F.C. *et al.* (2000) Redundant roles for the TFIID and SAGA complexes in global transcription. *Nature*, **405**, 701–704.
- Lee, T.I., Rinaldi, N.J., Robert, F. *et al.* (2002) Transcriptional regulatory networks in *Saccharomyces cerevisiae*. *Science*, **298**, 799–804.
- Lee, C.K., Shibata, Y., Rao, B., Strahl, B.D., and Lieb, J.D. (2004) Evidence for nucleosome depletion at active regulatory regions genome-wide. *Nature Genetics*, **36**, 900–905.
- Lee, W., Tillo, D., Bray, N. *et al.* (2007) A high-resolution atlas of nucleosome occupancy in yeast. *Nature Genetics*, **39**, 1235–1244.
- Lee, H.-Y., Chou, J.-Y., Cheong, L. *et al.* (2008a) Incompatibility of nuclear and mitochondrial genomes causes hybrid sterility between two yeast species. *Cell*, **135**, 1065–1073.
- Lee, P., Cho, B.R., Joo, H.S., and Hahn, J.S. (2008b) Yeast Yak1 kinase, a bridge between PKA and stress-responsive transcription factors, Hsf1 and Msn2/Msn4. *Molecular Microbiology*, **70**, 882–895.
- Lee, P., Paik, S.M., Shin, C.S., Huh, W.K., and Hahn, J.S. (2011) Regulation of yeast Yak1 kinase by PKA and autophosphorylation-dependent 14-3-3 binding. *Molecular Microbiology*, **79**, 633–646.
- Leeuw, T., Wu, C., Schrag, J.D., Whiteway, M., Thomas, D.Y., and Leberer, E. (1998) Interaction of a G-protein beta-subunit with a conserved sequence in Ste20/PAK family protein kinases. *Nature*, **391**, 191–195.
- Lefebvre, O., Carles, C., Conesa, C. *et al.* (1992) TFC3: gene encoding the B-block binding subunit of the yeast transcription factor IIIC. *Proceedings of the National Academy of Sciences of the United States of America*, **89**, 10512–10516.
- Lefebvre, O., Ruth, J., and Sentenac, A. (1994) A mutation in the largest subunit of yeast TFIIC affects tRNA and 5S RNA synthesis. Identification of two classes of suppressors. *The Journal of Biological Chemistry*, **269**, 23374–23381.
- Lehle, L., Strahl, S., and Tanner, W. (2006) Protein glycosylation, conserved from yeast to man: a model organism helps elucidate congenital human diseases. *Angewandte Chemie (International Edition in English)*, **45**, 6802–6818.
- Leh-Louis, V., Wirth, B., Poitier, S., Souciet, J.L., and Despons, L. (2004) Expansion and contraction of the DUP240 multigene family in *Saccharomyces cerevisiae* populations. *Genetics*, **167**, 1611–1619.
- Leh-Louis, V., Despons, L., Friedrich, A. *et al.* (2012) *An interspecies yeast hybrid reveals early steps of genome resolution following polyploidization*. G3 (in press).
- Lejeune, C., Lollier, M., Demuyter, C. *et al.* (2007) Characterization of natural hybrids of *Saccharomyces bayanus* var. *uvarum*. *FEMS Yeast Research*, **7**, 540–549.
- Lelandais, G. and Devaux, F. (2010) Comparative functional genomics of stress responses in yeasts. *Omics*, **14**, 501–515.
- Lelandais, G., Goudot, C., and Devaux, F. (2011) The evolution of gene expression regulatory networks in yeasts. *Comptes Rendus Biologies*, **334**, 655–661.
- Lemaire, M., Xie, J., Meisterernst, M., and Collart, M.A. (2000) The NC2 repressor is dispensable in yeast mutated for the Sin4p component of the holoenzyme and plays roles similar to Mot1p *in vivo*. *Molecular Microbiology*, **36**, 163–173.
- Lemoine, F.J., Degtyareva, N.P., Lobachev, K., and Petes, T.D. (2005) Chromosomal translocations in yeast induced by low levels of DNA polymerase: a model for chromosome fragile sites. *Cell*, **120**, 587–598.
- Lengronne, A., Katou, Y., Mori, S. *et al.* (2004) Cohesin relocation from sites of chromosomal loading to places of convergent transcription. *Nature*, **430**, 573–578.
- Lengyel, P. and Soll, D. (1969) Mechanism of protein biosynthesis. *Bacteriological Reviews*, **33**, 264–301 (review).
- Leon, S., Erpapazoglou, Z., and Haguenaer-Tsapir, R. (2008) Ear1p and Ssh4p are new adaptors of the ubiquitin ligase Rsp5p for cargo ubiquitylation and sorting at multivesicular bodies. *Molecular Biology of the Cell*, **19**, 2379–2388.
- Lepingle, A., Casaregola, S., Neuveglise, C. *et al.* (2000) Genomic exploration of the hemiascomycetous yeasts, 14. *Debaryomyces hansenii* var. *hansenii*. *FEBS Letters*, **487**, 82–86.
- Lesage, P. and Todeschini, A.L. (2005) Happy together: the life and times of Ty retrotransposons and their hosts. *Cytogenetic and Genome Research*, **110**, 70–90.
- Leuenberger, D., Bally, N.A., Schatz, G., and Koehler, C.M. (1999) Different import pathways through the mitochondrial intermembrane space for inner membrane proteins. *The EMBO Journal*, **18**, 4816–4822.
- Leveillard, T., Kassavetis, G.A., and Geiduschek, E.P. (1991) *Saccharomyces cerevisiae* transcription factors IIIB and IIIC bend the DNA of a tRNA^{Gln} gene. *The Journal of Biological Chemistry*, **266**, 5162–5168.
- Leveillard, T., Kassavetis, G.A., and Geiduschek, E.P. (1993) Repression and redirection of *Saccharomyces cerevisiae* tRNA synthesis from upstream of the transcriptional start site. *The Journal of Biological Chemistry*, **268**, 3594–3603.
- Levin, D.E. (2005) Cell wall integrity signaling in *Saccharomyces cerevisiae*. *Microbiology and Molecular Biology Reviews*, **69**, 262–291.
- Levinger, L. and Varshavsky, A. (1980) Separation of nucleosomes containing and lacking ubiquitin-H2A semihistone. *Proceedings of the National Academy of Sciences of the United States of America*, **77**, 3244–3248.
- Levy, S.F. and Siegal, M.L. (2008) Network hubs buffer environmental variation in *Saccharomyces cerevisiae*. *PLoS Biology*, **6**, e264.
- Levy, J. (1994) Sequencing the yeast genome: an international achievement. *Yeast (Chichester, England)*, **10**, 1689–1706 (review).
- Lew, D.J. and Burke, D.J. (2003) The spindle assembly and spindle position checkpoints. *Annual Review of Genetics*, **37**, 251–282.
- Lew, D.J. and Reed, S.I. (1995) A cell cycle checkpoint monitors cell morphogenesis in budding yeast. *The Journal of Cell Biology*, **129**, 739–749.
- Lew, D.J. (2003) The morphogenesis checkpoint: how yeast cells watch their figures. *Current Opinion in Cell Biology*, **15**, 648–653.
- Lewis, M.J., Sweet, D.J., and Pelham, H.R. (1990) The *ERD2* gene determines the specificity of the luminal ER protein retention system. *Cell*, **61**, 1359–63.
- Lewis, M.J., Nichols, B.J., Prescianotto-Baschong, C., Riezman, H., and Pelham, H.R. (2000) Specific retrieval of the exocytic SNARE Snc1p from early yeast endosomes. *Molecular Biology of the Cell*, **11**, 23–38.
- Lewis, A., Felberbaum, R., and Hochstrasser, M. (2007) A nuclear envelope protein linking nuclear pore basket assembly, SUMO

- protease regulation, and mRNA surveillance. *The Journal of Cell Biology*, **178**, 813–827.
- Li, S.J. and Hochstrasser, M. (2000) The yeast *ULP2* (SMT4) gene encodes a novel protease specific for the ubiquitin-like Smt3 protein. *Molecular and Cellular Biology*, **20**, 2367–2377.
- Li, S.J. and Hochstrasser, M. (2003) The Ulp1 SUMO isopeptidase: distinct domains required for viability, nuclear envelope localization, and substrate specificity. *The Journal of Cell Biology*, **160**, 1069–1081.
- Li, H. and Johnson, A.D. (2010) Evolution of transcription networks – lessons from yeasts. *Current Biology*, **20**, R746–753.
- Li, F. and Johnston, M. (1997) Grr1 of *Saccharomyces cerevisiae* is connected to the ubiquitin proteolysis machinery through Skp1: coupling glucose sensing to gene expression and the cell cycle. *The EMBO Journal*, **16**, 101–110.
- Li, C.M. and Klevecz, R.R. (2006) A rapid genome-scale response of the transcriptional oscillator to perturbation reveals a period-doubling path to phenotypic change. *Proceedings of the National Academy of Sciences of the United States of America*, **103**, 16254–16259.
- Li, S.H. and Li, X.J. (2004) Huntingtin–protein interactions and the pathogenesis of Huntington’s disease. *Trends in Genetics*, **20**, 146–154.
- Li, J. and Zhu, Z. (2010) Research and development of next generation of antibody-based therapeutics. *Acta Pharmacologica Sinica*, **31**, 1198–1207 (review).
- Li, Y., Flanagan, P.M., Tschochner, H., and Kornberg, R.D. (1994) RNA polymerase II initiation factor interactions and transcription start site selection. *Science*, **263**, 805–807.
- Li, Y., Bjorklund, S., Jiang, Y.W. *et al.* (1995) Yeast global transcriptional regulators Sin4 and Rgr1 are components of mediator complex/RNA polymerase II holoenzyme. *Proceedings of the National Academy of Sciences of the United States of America*, **92**, 10864–10868.
- Li, Y., Bjorklund, S., Kim, Y.J., and Kornberg, R.D. (1996) Yeast RNA polymerase II holoenzyme. *Methods in Enzymology*, **273**, 172–175.
- Li, R., Yu, D.S., Tanaka, M., Zheng, L., Berger, S.L., and Stillman, B. (1998) Activation of chromosomal DNA replication in *Saccharomyces cerevisiae* by acidic transcriptional activation domains. *Molecular and Cellular Biology*, **18**, 1296–1302.
- Li, B., Nierras, C.R., and Warner, J.R. (1999) Transcriptional elements involved in the repression of ribosomal protein synthesis. *Molecular and Cellular Biology*, **19**, 5393–5404.
- Li, J., Saxena, S., Pain, D., and Dancis, A. (2001) Adrenodoxin reductase homolog (Arh1p) of yeast mitochondria required for iron homeostasis. *The Journal of Biological Chemistry*, **276**, 1503–1509.
- Li, F., Long, T., Lu, Y., Ouyang, Q., and Tang, C. (2004) The yeast cell-cycle network is robustly designed. *Proceedings of the National Academy of Sciences of the United States of America*, **101**, 4781–4786.
- Li, J., Lee, W.L., and Cooper, J.A. (2005) NudEL targets dynein to microtubule ends through LIS1. *Nature Cell Biology*, **7**, 686–690.
- Li, H., Ilin, S., Wang, W. *et al.* (2006a) Molecular basis for site-specific read-out of histone H3K4me3 by the BPTF PHD finger of NURF. *Nature*, **442**, 91–95.
- Li, W., Sun L., Liang, Q., Wang, J., Mo, W., and Zhou, B. (2006a) Yeast AMID homologue Ndi1p displays respiration-restricted apoptotic activity and is involved in chronological aging. *Molecular Biology of the Cell*, **17**, 1802–1811.
- Li, H., Tsang, C.K., Watkins, M., Bertram, P.G., and Zheng, X.F. (2006b) Nutrient regulates Tor1 nuclear localization and association with rDNA promoter. *Nature*, **442**, 1058–1061.
- Li, W., Li, W., Sun, L. *et al.* (2006c) Yeast AMID homologue Ndi1p displays respiration-restricted apoptotic activity and is involved in chronological aging. *Molecular Biology of the Cell*, **17**, 1802–1811.
- Li, J., Min, R., Vizeacoumar, F.J., Jinb, K., Xina, X., and Zhang, Z. (2010) Exploiting the determinants of stochastic gene expression in *Saccharomyces cerevisiae* for genome-wide prediction of expression noise. *Proceedings of the National Academy of Sciences of the United States of America*, **107**, 10472–10477.
- Li, J., Richter, K., and Buchner, J. (2011) Mixed Hsp90–cochaperone complexes are important for the progression of the reaction cycle. *Nature Structural & Molecular Biology*, **18**, 61–66.
- Li, D. (2010a) A *de novo* originated gene depresses budding yeast mating pathway and is repressed by the protein encoded by its antisense strand. *Cell Research*, **20**, 408–420.
- Li, Y. (2010b) Commonly used tag combinations for tandem affinity purification. *Biotechnology and Applied Biochemistry*, **55**, 73–83.
- Liakopoulos, D., Doenges, G., Matuschewski, K., and Jentsch, S. (1998) A novel protein modification pathway related to the ubiquitin system. *The EMBO Journal*, **17**, 2208–2214.
- Liakopoulos, D., Busgen, T., Brychzy, A., Jentsch, S., and Pause, A. (1999) Conjugation of the ubiquitin-like protein NEDD8 to cullin-2 is linked to von Hippel-Lindau tumor suppressor function. *Proceedings of the National Academy of Sciences of the United States of America*, **96**, 5510–5515.
- Liang, C., Weinreich, M., and Stillman, B. (1995) ORC and Cdc6p interact and determine the frequency of initiation of DNA replication in the genome. *Cell*, **81**, 667–676.
- Liang, G., Klose, R.J., Gardner, K.E., and Zhang, Y. (2007) Yeast Jhd2p is a histone H3 Lys4 trimethyl demethylase. *Nature Structural & Molecular Biology*, **14**, 243–245.
- Liao, S.M., Zhang, J., Jeffery, D.A. *et al.* (1995) A kinase–cyclin pair in the RNA polymerase II holoenzyme. *Nature*, **374**, 193–196.
- Libuda, D.E. and Winston, F. (2006) Amplification of histone genes by circular chromosome formation in *Saccharomyces cerevisiae*. *Nature*, **443**, 1003–1007.
- Licitra, E.J. and Liu, J.O. (1996) A three-hybrid system for detecting small ligand–protein receptor interactions. *Proceedings of the National Academy of Sciences of the United States of America*, **93**, 12817–12821.
- Lida, T., Sumita, T., Ohta, A., and Takagi, M. (2000) The cytochrome P450ALK multigene family of an *n*-alkane-assimilating yeast, *Yarrowia lipolytica*, cloning and characterization of genes coding for new CYP52 family members. *Yeast (Chichester, England)*, **16**, 1077–1087.
- Lieb, J.D. and Clarke, N.D. (2005) Control of transcription through intragenic patterns of nucleosome composition. *Cell*, **123**, 1187–1190.
- Lieb, J.D., Liu, X., Botstein, D., and Brown, P.O. (2001) Promoter-specific binding of Rap1 revealed by genome-wide maps of protein–DNA association. *Nature Genetics*, **28**, 327–334.
- Liljelund, P., Mariotte, S., Buhler, J.M., and Sentenac, A. (1992) Characterization and mutagenesis of the gene encoding the A49 subunit of RNA polymerase A in *Saccharomyces cerevisiae*. *Proceedings of the National Academy of Sciences of the United States of America*, **89**, 9302–9305.
- Lill, R. and Kispal, G. (2000) Maturation of cellular Fe–S proteins: an essential function of mitochondria. *Trends in Biochemical Sciences*, **25**, 352–356 (review).
- Lill, R. and Kispal, G. (2001) Mitochondrial ABC transporters. *Research in Microbiology*, **152**, 331–340 (review).
- Lill, R. and Muhlenhoff, U. (2006) Iron–sulfur protein biogenesis in eukaryotes: components and mechanisms. *Annual Review of Cell and Developmental Biology*, **22**, 457–486 (review).
- Lill, R. and Muhlenhoff, U. (2008) Maturation of iron–sulfur proteins in eukaryotes: mechanisms, connected processes, and diseases. *Annual Review of Biochemistry*, **77**, 669–700.
- Lill, R., Diekert, K., Kaut, A. *et al.* (1999) The essential role of mitochondria in the biogenesis of cellular iron–sulfur proteins. *Biological Chemistry*, **380**, 1157–1166 (review).
- Lill, R., Dutkiewicz, R., Elsässer, H.P. *et al.* (2006) Mechanisms of iron–sulfur protein maturation in mitochondria, cytosol and nucleus of eukaryotes. *Biochimica et Biophysica Acta*, **1763**, 652–667 (review).
- Lim, R.Y. and Fahrenkrog, B. (2006) The nuclear pore complex up close. *Current Opinion in Cell Biology*, **18**, 342–347.
- Lim, C.R., Kimata, Y., Ohdate, H. *et al.* (2000) The *Saccharomyces cerevisiae* RuvB-like protein, Tih2p, is required for cell cycle progression and RNA polymerase II-directed transcription. *The Journal of Biological Chemistry*, **275**, 22409–22417.
- Lim, R.Y., Huang, N.P., Köser, J. *et al.* (2006) Flexible phenylalanine–glycine nucleoporins as entropic barriers to nucleocytoplasmic transport. *Proceedings of the National Academy of Sciences of the United States of America*, **103**, 9512–9517.
- Lim, R.Y., Fahrenkrog, B., Köser, J., Schwarz-Herion, K., Deng, J., and Aebi, U. (2007a) Nanomechanical basis of selective gating by the nuclear pore complex. *Science*, **318**, 640–643.
- Lim, R.Y., Köser, J., Huang, N.P., Schwarz-Herion, K., and Aebi, U. (2007b) Nanomechanical interactions of phenylalanine–glycine nucleoporins studied by single molecule force–volume spectroscopy. *Journal of Structural Biology*, **159**, 277–289.
- Lin, Z. and Li, W.H. (2011) Expansion of hexose transporter genes was associated with the evolution of aerobic fermentation in

- yeasts. *Molecular Biology and Evolution*, **28**, 131–142.
- Lin, Y.S., Carey, M., Ptashne, M., and Green, M. R. (1990) How different eukaryotic transcriptional activators can cooperate promiscuously. *Nature*, **345**, 359–361.
- Lin, Y., Shiraga, S., Tsumuraya, T. *et al.* (2004) Comparison of two forms of catalytic antibody displayed on yeast-cell surface. *Journal of Molecular Catalysis B: Enzymatic*, **28**, 247.
- Lindgren, C.C. (1949) *The Yeast Cell: Its Genetics and Cytology*, Educational Publishers, St Louis, MO.
- Linder, P. (2006) DEAD-box proteins: a family affair – active and passive players in RNP-remodeling. *Nucleic Acids Research*, **34**, 4168–4180.
- Lindquist, S. and Craig, E.A. (1988) The heat shock proteins. *Annual Review of Genetics*, **55**, 631–677 (review).
- Lindquist, S. and Kim, G. (1996) Heat shock protein 104 expression is sufficient for thermotolerance in yeast. *Proceedings of the National Academy of Sciences of the United States of America*, **93**, 5301–5306.
- Lindstrom, D.L. and Gottschling, D.E. (2009) The mother enrichment program, a genetic system for facile replicative life span analysis in *Saccharomyces cerevisiae*. *Genetics*, **183**, 413–422.
- Lindstrom, D.L., Squazzo, S.L., Muster, N. *et al.* (2003) Dual roles for Spt5 in pre-mRNA processing and transcription elongation revealed by identification of Spt5-associated proteins. *Molecular and Cellular Biology*, **23**, 1368–1378.
- Lindstrom, D.L., Leverich, C.K., Henderson, K., and Gottschling, D.E. (2011) Replicative age induces mitotic recombination in the ribosomal RNA gene cluster of *Saccharomyces cerevisiae*. *PLoS Genetics*, **7**, e1002015.
- Lingner, J., Radtke, I., Wahle, E., and Keller, W. (1991) Purification and characterization of poly(A) polymerase from *Saccharomyces cerevisiae*. *The Journal of Biological Chemistry*, **266**, 8741–8746.
- Lipford, J.R. and Bell, S.P. (2001) Nucleosomes positioned by ORC facilitate the initiation of DNA replication. *Molecular Cell*, **7**, 21–30.
- Lipke, P.N. and Kurjan, J. (1992) Sexual agglutination in budding yeasts: structure, function, and regulation of adhesion glycoproteins. *Microbiological Reviews*, **56**, 180–194 (review).
- Lipke, P.N. and Ovalle, R. (1998) Cell wall architecture in yeast: new structure and new challenges. *Journal of Bacteriology*, **180**, 3735–3740 (review).
- Lippincott, J., Shannon, K.B., Shou, W., Deshaies, R.J., and Li, R. (2001) The Tem1 small GTPase controls actomyosin and septin dynamics during cytokinesis. *Journal of Cell Science*, **114**, 1379–1386.
- Lipson, C., Alalou, G., Bajore, M. *et al.* (2008) A proteasomal ATPase contributes to dislocation of endoplasmic reticulum-associated degradation (ERAD) substrates. *The Journal of Biological Chemistry*, **283**, 7166–7175.
- Lithgow, T., Junne, T., Suda, K., Gratzner, S., and Schatz, G. (1994) The mitochondrial outer membrane protein Mas22p is essential for protein import and viability of yeast. *Proceedings of the National Academy of Sciences of the United States of America*, **91**, 11973–11977.
- Liti, G. and Louis, E.J. (2005) Yeast evolution and comparative genomics. *Annual Review of Microbiology*, **59**, 135–153.
- Liti, G. and Schacherer, J. (2011) The rise of yeast population genomics. *Comptes Rendus Biologies*, **334**, 612–619.
- Liti, G., Barton, D.B.H., and Louis, E.J. (2006) Sequence diversity, reproductive isolation and species concepts in *Saccharomyces*. *Genetics*, **174**, 839–850.
- Liti, G., Carter, D.M., Moses, A.M. *et al.* (2009) Population genomics of domestic and wild yeasts. *Nature*, **458**, 337–341.
- Liu, Y.J. and Hall, B.D. (2004) Bodyplan evolution of ascomycetes, as inferred from an RNA polymerase II phylogeny. *Proceedings of the National Academy of Sciences of the United States of America*, **101**, 4507–4512.
- Liu, H., Tan, X., Veenhuis, M., McCollum, D., and Cregg, J.M. (1992) An efficient screen for peroxisome-deficient mutants of *Pichia pastoris*. *Journal of Bacteriology*, **174**, 4943–4951.
- Liu, H., Styles, C.A., and Fink, G.R. (1993) Elements of the yeast pheromone response pathway required for filamentous growth of diploids. *Science*, **262**, 1741–1744.
- Liu, C.L., Kaplan, T., Kim, M. *et al.* (2005a) Single-nucleosome mapping of histone modifications in *S. cerevisiae*. *PLoS Biology*, **3**, e328.
- Liu, X., Noll, D.M., Lieb, J.D., and Clarke, N.D. (2005b) DIP-chip: rapid and accurate determination of DNA-binding specificity. *Genome Research*, **15**, 421–427.
- Liu, B., Gong, X., Chang, S., Yang, Y., Song, M., Duan, D., Wang, L., Ma, Q., and Wu, J. (2009) Disruption of the OCH1 and MNN1 genes decrease N-glycosylation on glycoprotein expressed in *Kluyveromyces lactis*. *Journal of Biotechnology*, **143**, 95–102.
- Liu, J., Sun, Y., Drubin, D.G., and Oster, G.F. (2009a) The mechanochemistry of endocytosis. *PLoS Biology*, **7**, e1000204.
- Liu, Y., Mimura, S., Kishi, T., and Kamura, T. (2009b) A longevity protein, Lag2, interacts with SCF complex and regulates SCF function. *The EMBO Journal*, **28**, 3366–3377.
- Liu, J., Sun, Y., Oster, G.F., and Drubin, D.G. (2010) Mechanochemical crosstalk during endocytic vesicle formation. *Current Opinion in Cell Biology*, **22**, 36.
- Liu, X., Bushnell, D.A., Silva, D.A., Huang, X., and Kornberg, R.D. (2011) Initiation complex structure and promoter proofreading: X-ray studies of early RNA polymerase II transcribing complexes reveal the basis of abortive initiation and its role in promoter control. *Science*, **333**, 633–637.
- Livingstone-Zatchej, M. and Thoma, F. (1999) Mapping of nucleosome positions in yeast. *Methods in Molecular Biology (Clifton, NJ)*, **119**, 363–378 (review).
- Llorente, B., Malpertuy, A., Neuvéglise, C. *et al.* (2000) Genomic exploration of the hemiascomycetous yeasts, 18. Comparative analysis of chromosome maps and synteny with *Saccharomyces cerevisiae*. *FEBS Letters*, **487**, 101–112.
- Llorente, B., Smith, C.E., and Symington, L.S. (2008) Break-induced replication, what is it and what is it for? *Cell Cycle (Georgetown, Tex.)*, **7**, 859–864.
- Lloyd, D. and Murray, D.B. (2006) The temporal architecture of eukaryotic growth. *FEBS Letters*, **580**, 2830–2835 (review).
- Lloyd, A.T. and Sharp, P.M. (1993) Synonymous codon usage in *Kluyveromyces lactis*. *Yeast*, **9**, 1219–1228.
- Lünsdorf, H., Gurrnkonda, C., Adnan, A., Khanna, N., and Rinas, U. (2011) Virus-like particle production with yeast: ultrastructural and immunocytochemical insights into *Pichia pastoris* producing high levels of the hepatitis B surface antigen. *Microbial Cell Factories*, **10**, 48.
- Lochmüller, H., Stucka, R., and Feldmann, H. (1989) A hot-spot for transposition of various Ty elements on chromosome V in *Saccharomyces cerevisiae*. *Current Genetics*, **16**, 247–252.
- Lodi, T. and Guiard, B. (1991) Complex transcriptional regulation of the *Saccharomyces cerevisiae* CYB2 gene encoding cytochrome *b₂*: CYP1(HAP1) activator binds to the CYB2 upstream activation site UAS1-B2. *Molecular and Cellular Biology*, **11**, 3762–3772.
- Lodi, T., Alberti, A., Guiard, B., and Ferrero, I. (1999) Regulation of the *Saccharomyces cerevisiae* DLD1 gene encoding the mitochondrial protein D-lactate ferricytochrome *c* oxidoreductase by HAP1 and HAP2/3/4/5. *Molecular & General Genetics*, **262**, 623–632.
- Loewith, R., Jacinto, E., Wullschlegel, S. *et al.* (2002) Two TOR complexes, only one of which is rapamycin sensitive, have distinct roles in cell growth control. *Molecular Cell*, **10**, 457–468.
- Loftus, B.J., Fung, E., Roncaglia, P. *et al.* (2005) The genome of the basidiomycetous yeast and human pathogen *Cryptococcus neoformans*. *Science*, **307**, 1321–1324.
- Lohman, T.M., Tomko, E.J., and Wu, C.G. (2008) Non-hexameric DNA helicases and translocases: mechanisms and regulation. *Nature Reviews Molecular Cell Biology*, **9**, 391–401.
- Lohr, D., Venkov, P., and Zlatanova, J. (1995) Transcriptional regulation in the yeast GAL gene family: a complex genetic network. *The FASEB Journal*, **9**, 777–787 (review).
- Lohr, D. (1997) Nucleosome transactions on the promoters of the yeast GAL and PHO genes. *The Journal of Biological Chemistry*, **272**, 26795–26798 (review).
- Lommel, L., Ortolan, T., Chen, L., Madura, K., and Sweder, K.S. (2002) Proteolysis of a nucleotide excision repair protein by the 26S proteasome. *Current Genetics*, **42**, 9–20.
- Longatti, A. and Tooze, S.A. (2009) Vesicular trafficking and autophagosome formation. *Cell Death and Differentiation*, **16**, 956–965.
- Longley, M.J., Clark, S., Yu Wai Man, C. *et al.* (2006) Mutant POLG2 disrupts DNA polymerase gamma subunits and causes progressive external ophthalmoplegia. *American Journal of Human Genetics*, **78**, 1026–1034.
- Longo, V.D., Ellerby, L., Bredesen, D.E., Valentine, J.S., and Gralla, E.B. (1997) Human Bcl-2 reverses survival defects in yeast lacking superoxide dismutase and delays death of wild-type yeast. *The Journal of Cell Biology*, **137**, 1581–1588.

- Longtine, M.S. and Bi, E. (2003) Regulation of septin organization and function in yeast. *Trends in Cell Biology*, **13**, 403–409.
- Longtine, M.S., Theesfeld, C.L., McMillan, J.N., Weaver, E., Pringle, J.R., and Lew, D.J. (2000) Septin-dependent assembly of a cell cycle-regulatory module in *Saccharomyces cerevisiae*. *Molecular and Cellular Biology*, **20**, 4049–4061.
- Loo, S., Fox, C.A., Rine, J., Kobayashi, R., Stillman, B., and Bell, S. (1995) The origin recognition complex in silencing, cell cycle progression, and DNA replication. *Molecular Biology of the Cell*, **6**, 741–756.
- Lorch, Y., Zhang, M., and Kornberg, R.D. (1999) Histone octamer transfer by a chromatin-remodeling complex. *Cell*, **96**, 389–392.
- Lorch, Y., Beve, J., Gustafsson, C.M., Myers, L. C., and Kornberg, R.D. (2000) Mediator-nucleosome interaction. *Molecular Cell*, **6**, 197–201.
- Lord, J.M., Roberts, L.M., and Stirling, C.J. (2005) Quality control: another player joins the ERAD cast. *Current Biology*, **15**, R963–R964 (review).
- Lorentzen, E. and Conti, E. (2005) Structural basis of 3' end RNA recognition and exoribonucleolytic cleavage by an exosome RNase PH core. *Molecular Cell*, **20**, 473–481.
- Lorentzen, E. and Conti, E. (2006) The exosome and the proteasome: nano-compartments for degradation. *Cell*, **125**, 651–654.
- Lorick, K.L., Jensen, J.P., Fang, S., Ong, A.M., Hatakeyama, S., and Weissman, A.M. (1999) RING fingers mediate ubiquitin-conjugating enzyme (E2)-dependent ubiquitination. *Proceedings of the National Academy of Sciences of the United States of America*, **96**, 11364–11369.
- Losada, A., Hirano, M., and Hirano, T. (1998) Identification of *Xenopus* SMC protein complexes required for sister chromatid cohesion. *Genes and Development*, **12**, 1986–1997.
- Losko, S., Kopp, F., Kranz, A., and Kolling, R. (2001) Uptake of the ATP-binding cassette (ABC) transporter Ste6 into the yeast vacuole is blocked in the *doa4* mutant. *Molecular Biology of the Cell*, **12**, 1047–1059.
- Lottspeich, F. and Kellermann, J. (2011) ICPL labeling strategies for proteome research. *Methods in Molecular Biology (Clifton, NJ)*, **753**, 55–64.
- Lotz, G.P., Lin, H., Harst, A., and Obermann, W. M. (2003) Aha1 binds to the middle domain of Hsp90, contributes to client protein activation, and stimulates the ATPase activity of the molecular chaperone. *The Journal of Biological Chemistry*, **278**, 17228–17235.
- Lou, H., Komata, M., Katou, Y. et al. (2008) Mrc1 and DNA polymerase epsilon function together in linking DNA replication and the S phase checkpoint. *Molecular Cell*, **32**, 106–117.
- Louis, E.J. and Borts, R.H. (1995) A complete set of marked telomeres in *Saccharomyces cerevisiae* for physical mapping and cloning. *Genetics*, **139**, 125–136.
- Louis, E.J. and Haber, J.E. (1992) The structure and evolution of subtelomeric Y repeats in *Saccharomyces cerevisiae*. *Genetics*, **119**, 303–315.
- Louis, V.L., Despons, L., Friedrich, A., Martin, T., Durrens, P., Casarégola, S., Neuvéglise, C., Fairhead, C., Marck, C., Cruz, J.A., Straub, M. L., Kugle, R.V., Sacerdot, C., Uzunov, Z., Thierry, A., Weiss, S., Bleykasten C., De Montigny, J., Jacques, N., Jung, P., Lemaire, M., Mallet, S., Morel, G., Richard, G.F., Sarkar, A., Savel, G., Schacherer, J., Seret, M. L., Talla, E., Samson, G., Jubin, C., Poulain, J., Vacherie, B., Barbe, V., Pelletier, E., Sherman, D.J., Westhof, E., Weissenbach, J., Baret, P.V., Wincker, P., Gaillardin, C., Dujon, B., and Souciet, J.L. (2012) Pichia sorbitophila, an Interspecies Yeast Hybrid, Reveals Early Steps of Genome Resolution After Polyploidization. *G3 (Bethesda)*, **2**, 299–311.
- Louis, E.J. (1995) The chromosome ends of *S. cerevisiae*. *Yeast (Chichester, England)*, **11**, 1553–1573.
- Louvion, J.F., Havaux-Copf, B., and Picard, D. (1993) Fusion of GAL4-VP16 to a steroid-binding domain provides a tool for gratuitous induction of galactose-responsive genes in yeast. *Genetics*, **131**, 129–134.
- Lowe, T.M. and Eddy, S.R. (1999) A computational screen for methylation guide snoRNAs in yeast. *Science*, **283**, 168–171.
- Lowell, J.E. and Pillus, L. (1998) Telomere tales: chromatin, telomerase and telomere function in *Saccharomyces cerevisiae*. *Cellular and Molecular Life Sciences*, **54**, 32–49 (review).
- Luciau-Danila, A., Delaveau, T., Lelandais, G., Devaux, F., and Jacq, C. (2003) Competitive promoter occupancy by two yeast paralogous transcription factors controlling the multidrug resistance phenomenon. *The Journal of Biological Chemistry*, **278**, 52641–52650.
- Lue, N.F. (2010) The plasticity of telomere maintenance mechanisms in yeast. *Trends in Biochemical Sciences*, **35**, 8.
- Lum, R., Tkach, J.M., Vierling, E., and Glover, J. R. (2004) Evidence for an unfolding/threading mechanism for protein disaggregation by *Saccharomyces cerevisiae* Hsp104. *The Journal of Biological Chemistry*, **279**, 29139–29146.
- Luna, R., Gaillard, H., Gonzalez-Aguilera, C., and Aguilera, A. (2008) Biogenesis of mRNPs: integrating different processes in the eukaryotic nucleus. *Chromosoma*, **117**, 319–331.
- Luna, R., Rondón, A.G., and Aguilera, A. (2012) New clues to understand the role of THO and other functionally related factors in mRNP biogenesis. *Biochimica et Biophysica Acta*, **1819**, 514–520.
- Lundblad, V. and Blackburn, E.H. (1993) An alternative pathway for yeast telomere maintenance rescues *est1* sequences. *Cell*, **73**, 347–360.
- Lundblad, V. (2003) Telomere replication: an Est fest. *Current Biology*, **13**, R439–R441.
- Lupashin, V.V., Hamamoto, S., and Schekman, R.W. (1996) Biochemical requirements for the targeting and fusion of ER-derived transport vesicles with purified yeast Golgi membranes. *The Journal of Cell Biology*, **132**, 277–289.
- Luscombe, N.L., Madan Babu, M., Haiyuan, Yu., Snyder, M., Teichmann, S.A., and Gerstein, M. (2004) Genomic analysis of regulatory network dynamics reveals large topological changes. *Nature*, **431**, 308.
- Lustig, A.J. and Petes, T.D. (1986) Identification of yeast mutants with altered telomere structure. *Proceedings of the National Academy of Sciences of the United States of America*, **83**, 1398–1402.
- Lustig, A.J., Kurtz, S., and Shore, D. (1990) Involvement of the silencer and UAS binding protein RAP1 in regulation of telomere length. *Science*, **250**, 549–553.
- Lustig, A.J. (1998) Mechanisms of silencing in *Saccharomyces cerevisiae*. *Current Opinion in Genetics & Development*, **8**, 233–239 (review).
- Lutfiyya, L.L., Iyer, V.R., DeRisi, J.L., DeVit, M.J., Brown, P.O., and Johnston, M. (1998) Characterization of three related glucose repressors and genes they regulate in *Saccharomyces cerevisiae*. *Genetics*, **150**, 1377–1391.
- Luttik, M.A., Overkamp, K.M., Kötter, P., de Vries, S., van Dijken, J.P., and Pronk, J.T. (1998) The *Saccharomyces cerevisiae* NDE1 and NDE2 genes encode separate mitochondrial NADH dehydrogenases catalyzing the oxidation of cytosolic NADH. *The Journal of Biological Chemistry*, **273**, 24529–24534.
- Lutz, T., Neupert, W., and Herrmann, J.M. (2003) Import of small Tim proteins into the mitochondrial intermembrane space. *The EMBO Journal*, **22**, 4400–4408.
- Lyapina, S., Cope, G., Shevchenko, A. et al. (2001) COP9 signalosome promotes cleavage of NEDD8–CUL1 conjugates. *Science*, **292**, 1382–1385.
- Lydall, D., Ammerer, G., and Nasmyth, K. (1991) A new role for MCM1 in yeast: cell cycle regulation of *SWI5* transcription. *Genes and Development*, **5**, 2405–2419.
- Lydall, D. (2003) Hiding at the ends of yeast chromosomes: telomeres, nucleases and checkpoint pathways. *Journal of Cell Science*, **116**, 4057–4065 (review).
- Lykke-Andersen, S., Brodersen, D.E., and Jensen, T.H. (2009) Origins and activities of the eukaryotic exosome. *Journal of Cell Science*, **122**, 1487–1494.
- Lyman, S.K. and Schekman, R. (1995) Interaction between BiP and Sec63p is required for the completion of protein translocation into the ER of *Saccharomyces cerevisiae*. *The Journal of Cell Biology*, **131**, 1163–1171.
- Lyman, S.K. and Schekman, R. (1997) Binding of secretory precursor polypeptides to a translocon subcomplex is regulated by BiP. *Cell*, **88**, 85–96.
- Lynch, M., Sung, W., Morris, K. et al. (2008) A genome-wide view of the spectrum of spontaneous mutations in yeast. *Proceedings of the National Academy of Sciences of the United States of America*, **105**, 9272–9277.
- Lynch, D.B., Logue, M.E., Butler, G., and Wolfe, K.H. (2010) Chromosomal G+C content evolution in yeasts, systematic interspecies differences, and GC-poor troughs at centromeres. *Genome Biology and Evolution*, **2**, 572–583.
- Lynch, M. (2007) *The Origins of Genome Architecture*, Sinauer Associates, Sunderland, MA.
- Lyons, T.J., Gasch, A.P., Gaither, L.A., Botstein, D., Brown, P.O., and Eide, D.J. (2000) Genome-wide characterization of the Zap1p zinc-responsive regulon in yeast. *Proceedings of the National Academy of Sciences of the United States of America*, **97**, 7957–7962.

- Lyons, T.J., Villa, N.Y., Regalla, L.M., Kupchak, B.R., Vagstad, A., and Eide, D.J. (2004) Metalloregulation of yeast membrane steroid receptor homologs. *Proceedings of the National Academy of Sciences of the United States of America*, **101**, 5506–5511.
- Ma, J. and Ptashne, M. (1987) A new class of yeast transcriptional activators. *Cell*, **51**, 113–119.
- Ma, L.J., Ibrahim, A.S., Skory, C. *et al.* (2009) Genomic analysis of the basal lineage fungus *Rhizopus oryzae* reveals a whole-genome duplication. *PLoS Genetics*, **5**, e1000549.
- Ma, C., Agrawal, G., and Subramani, S. (2011) Peroxisome assembly, matrix and membrane protein biogenesis. *The Journal of Cell Biology*, **193**, 7–16.
- Ma, D. (2001) Applications of yeast in drug discovery. *Progress in Drug Research*, **57**, 117–162.
- Maassen, N., Freese, S., Schruoff, B., Passoth, V., and Klinner, U. (2008) Nonhomologous end joining and homologous recombination DNA repair pathways in integration mutagenesis in the xylose-fermenting yeast *Pichia stipitis*. *FEMS Yeast Research*, **8**, 735–743.
- Maccacchini, M.L., Rudin, Y., Blobel, G., and Schatz, G. (1979) Import of proteins into mitochondria: precursor forms of the extramitochondrially made F₁-ATPase subunits in yeast. *Proceedings of the National Academy of Sciences of the United States of America*, **76**, 343–347.
- Macino, G., Coruzzi, G., Nobrega, F.G., Li, M., and Tzagoloff, A. (1979) Use of the UGA terminator as a tryptophan codon in yeast mitochondria. *Proceedings of the National Academy of Sciences of the United States of America*, **76**, 3784–3785.
- Macleod, C.J. and Greig, D. (2008) Prezygotic reproductive isolation between *Saccharomyces cerevisiae* and *Saccharomyces paradoxus*. *BMC Evolutionary Biology*, **8**, 1.
- Madden, K. and Snyder, M. (1998) Cell polarity and morphogenesis in budding yeast. *Annual Review of Microbiology*, **52**, 687–744.
- Madeo, F., Frohlich, E., and Frohlich, K.U. (1997) A yeast mutant showing diagnostic markers of early and late apoptosis. *The Journal of Cell Biology*, **139**, 729–734.
- Madhani, H.D. and Guthrie, C. (1992) A novel base-pairing interaction between U2 and U6 snRNAs suggests a mechanism for the catalytic activation of the spliceosome. *Cell*, **71**, 803–817.
- Madhani, H.D., Styles, C.A., and Fink, G.R. (1997) Filamentous growth in yeast. *Cell*, **91**, 673–684.
- Madison, J.T., Everett, G.A., and Kung, H.K. (1966) On the nucleotide sequence of yeast tyrosine transfer RNA. *Cold Spring Harbor Symposia on Quantitative Biology*, **31**, 409–416.
- Madzak, C., Gaillardin, C., and Beckerich, J.M. (2004) Heterologous protein expression and secretion in the non-conventional yeast *Yarrowia lipolytica*, a review. *Journal of Biotechnology*, **109**, 63–81.
- Maekawa, H., Priest, C., Lechner, J., Pereira, G., and Schiebel, E. (2007) The yeast centrosome translates the positional information of the anaphase spindle into a cell cycle signal. *The Journal of Cell Biology*, **179**, 423–436.
- Magasanik, B. and Kaiser, C.A. (2002) Nitrogen regulation in *Saccharomyces cerevisiae*. *Genetics*, **290**, 1–18.
- Mager, W.H. and Winderickx, J. (2005) Yeast as a model for medical and medicinal research. *Trends in Pharmacological Sciences*, **26**, 265–273.
- Magwene, P.M., Kaytçıt, Ö., Granek, J.A., Reininga, J.M., Scholl, Z., and Murray, D. (2011) Outcrossing, mitotic recombination, and life-history trade-offs shape genome evolution in *Saccharomyces cerevisiae*. *Proceedings of the National Academy of Sciences of the United States of America*, **108**, 1987–1992.
- Mah, A.S., Jang, J., and Deshaies, R.J. (2001) Protein kinase Cdc15 activates the Dbf2–Mob1 kinase complex. *Proceedings of the National Academy of Sciences of the United States of America*, **98**, 7325–7330.
- Mahajan, R., Gerace, L., and Melchior, F. (1998) Molecular characterization of the SUMO-1 modification of RanGAP1 and its role in nuclear envelope association. *The Journal of Cell Biology*, **140**, 259–270.
- Mahapatra, S., Dewari, P.S., Bhardwaj, A., and Bhargava, P. (2011) Yeast H2A.Z. FACT complex and RSC regulate transcription of tRNA gene through differential dynamics of flanking nucleosomes. *Nucleic Acids Research*, **39**, 4023–4034.
- Mai, B. and Breeden, L. (1997) Xbp1, a stress-induced transcriptional repressor of the *Saccharomyces cerevisiae* Swi4/Mbp1 family. *Molecular and Cellular Biology*, **17**, 6491–6501.
- Mai, B. and Breeden, L. (2000) CLN1 and its repression by Xbp1 are important for efficient sporulation in budding yeast. *Molecular and Cellular Biology*, **20**, 478–487.
- Maillet, L. and Collart, M.A. (2002) Interaction between Not1p, a component of the CCR4–NOT complex, a global regulator of transcription, and Dhh1p, a putative RNA helicase. *The Journal of Biological Chemistry*, **277**, 2835–2842.
- Majors, J.E., Swanstrom, R., DeLorbe, W.J. *et al.* (1981) DNA intermediates in the replication of retroviruses are structurally (and perhaps functionally) related to transposable elements. *Cold Spring Harbor Symposia on Quantitative Biology*, **45**, 731–738.
- Makde, R.D., England, J.R., Yennawar, H.P., and Tan, S. (2010) Structure of RCC1 chromatin factor bound to the nucleosome core particle. *Nature*, **467**, 562–566.
- Makio, T., Stanton, L.H., Lin, C.C., Goldfarb, D. S., Weis, K., and Wozniak, R.W. (2009) The yeast nucleoporins Nup170 and Nup157 are essential for nuclear pore complex assembly. *The Journal of Cell Biology*, **185**, 459–73.
- Malca, H., Shomron, N., and Ast, G. (2003) The U1 snRNP base pairs with the 5' splice site within a penta-snRNP complex. *Molecular and Cellular Biology*, **23**, 3442–3455.
- Malkus, P., Jiang, F., and Schekman, R. (2002) Concentrative sorting of secretory cargo proteins into COPII-coated vesicles. *The Journal of Cell Biology*, **159**, 915–921.
- Mallory, M.J., Cooper, K.F., and Strich, R. (2007) Meiosis-specific destruction of the Ume6p repressor by the Cdc20-directed APC/C. *Molecular Cell*, **27**, 951–961.
- Malone, C.D. and Hannon, G.J. (2009) Small RNAs as guardians of the genome. *Cell*, **136**, 656–668.
- Malpartida, F. and Serrano, R. (1980) Purification of the yeast plasma membrane ATPase solubilized with a novel zwitterionic detergent. *FEBS Letters*, **111**, 69–72.
- Malpertuy, A., Tekai, F., Casaregola, S. *et al.* (2000) Genomic exploration of the hemiascomycetous yeasts, 19. Ascomycetes-specific genes. *FEBS Letters*, **487**, 113–121.
- Mandal, A.K., Lee, P., Chen, J.A. *et al.* (2007) Cdc37 has distinct roles in protein kinase quality control that protect nascent chains from degradation and promote posttranslational maturation. *The Journal of Cell Biology*, **176**, 319–328.
- Mandel, C.R., Bai, Y., and Tong, L. (2008) Protein factors in pre-mRNA 3'-end processing. *Cellular and Molecular Life Sciences*, **65**, 1099–1122.
- Mangus, D.A., Smith, M.M., McSweeney, J.M., and Jacobson, A. (2004) Identification of factors regulating poly(A) tail synthesis and maturation. *Molecular and Cellular Biology*, **24**, 4196–4206.
- Maniatis, T. and Reed, R. (2002) An extensive network of coupling among gene expression machines. *Nature*, **416**, 499–506.
- Maniatis, T., Kee, S.G., Efstratiadis, A., and Kafatos, F.C. (1976) Amplification and characterization of a beta-globin gene synthesized *in vitro*. *Cell*, **8**, 163–182.
- Maniura-Weber, K., Helm, M., Engemann, K. *et al.* (2006) Molecular dysfunction associated with the human mitochondrial 3302A>G mutation in the MTTL1 (mt-tRNA^{Leu(UUR)}) gene. *Nucleic Acids Research*, **34**, 6404–6415.
- Mann, C., Buhler, J.M., Treich, I., and Sentenac, A. (1987) RPC40, a unique gene for a subunit shared between yeast RNA polymerases A and C. *Cell*, **48**, 627–637.
- Mannhaupt, G. and Feldmann, H. (2007) Genomic evolution of the proteasome system among hemiascomycetous yeasts. *Journal of Molecular Evolution*, **65**, 529–540.
- Mannhaupt, G., Pilz, U., and Feldmann, H. (1988) A series of shuttle vectors using chloramphenicol acetyltransferase as a reporter enzyme in yeast. *Gene*, **67**, 287–294.
- Mannhaupt, G., Schnall, R., Karpov, V., Vetter, I., and Feldmann, H. (1999) Rpn4p acts as a transcription factor by binding to PACE, a nonamer box found upstream of 26S proteasomal and other genes in yeast. *FEBS Letters*, **450**, 27–34.
- Manning-Krieg, U.C., Scherer, P.E., and Schatz, G. (1991) Sequential action of mitochondrial chaperones in protein import into the matrix. *The EMBO Journal*, **10**, 3273–3280.
- Marahrens, Y. and Stillman, B. (1992) A yeast chromosomal origin of DNA replication defined by multiple functional elements. *Science*, **255**, 817–823.
- Marcet-Houben, M. and Gabaldón, T. (2009) The tree versus the forest, the fungal tree of life and the topological diversity within the yeast phylome. *PLoS One*, **4**, e4357.
- Marcet-Houben, M. and Gabaldón, T. (2010) Acquisition of prokaryotic genes by fungal genomes. *Trends in Genetics*, **26**, 5–8.

- Marcet-Houben, M., Marceddu, G., and Gabaldón, T. (2009) Phylogenomics of the oxidative phosphorylation in fungi reveals extensive gene duplication followed by functional divergence. *BMC Evolutionary Biology*, **9**, 295.
- Marchler, G., Schuller, C., Adam, G., and Ruis, H. (1993) A *Saccharomyces cerevisiae* UAS element controlled by protein kinase A activates transcription in response to a variety of stress conditions. *The EMBO Journal*, **12**, 1997–2003.
- Marck, C., Lefebvre, O., Carles, C. *et al.* (1993) The TFIIIB-assembling subunit of yeast transcription factor TFIIIC has both tetratricopeptide repeats and basic helix–loop–helix motifs. *Proceedings of the National Academy of Sciences of the United States of America*, **90**, 4027–4031.
- Marck, C., Kachouri-Lafond, R., Lafontaine, I., Westhof, E., Dujon, B., and Grosjean, H. (2006) The RNA polymerase III-dependent family of genes in hemiascomycetes, comparative RNomics, decoding strategies, transcription and evolutionary implications. *Nucleic Acids Research*, **34**, 1816–1835.
- Margottin, F., Dujardin, G., Gerard, M., Egly, J. M., Huet, J., and Sentenac, A. (1991) Participation of the TATA factor in transcription of the yeast U6 gene by RNA polymerase C. *Science*, **251**, 424–426.
- Marini, V. and Krejci, L. (2010) Srs2: the “odd-job man” in DNA repair. *DNA Repair*, **9**, 268–275 (review).
- Marini, A.M., Soussi-Boudekou, S., Vissers, S., and André, B. (1997) A family of ammonium transporters in *Saccharomyces cerevisiae*. *Molecular and Cellular Biology*, **17**, 4282–4293.
- Marini, A.M., Matassi, G., Raynal, V., André, B., Cartron, J.P., and Chérif-Zahar, B. (2000) The human Rhesus-associated RhAG protein and a kidney homologue promote ammonium transport in yeast. *Nature Genetics*, **26**, 341–344.
- Marini, A.M., Boeckstaens, M., and André, B. (2006a) From yeast ammonium transporters to Rhesus proteins, isolation and functional characterization. *Transfusion Clinique et Biologique*, **13**, 95–96.
- Marini, A.M., Boeckstaens, M., Benjelloun, F., Chérif-Zahar, B., and André, B. (2006b) Structural involvement in substrate recognition of an essential aspartate residue conserved in Mep/Amt and Rh-type ammonium transporters. *Current Genetics*, **49**, 364–374.
- Marinoni, G., Manuel, M., Petersen, R.F., Hvidtfeldt, J., Slo, P., and Piskur, J. (1999) Horizontal transfer of genetic material among *Saccharomyces* yeasts. *Journal of Bacteriology*, **181**, 6488–6496.
- Maroney, P.A., Romfo, C.M., and Nilsen, T.W. (2000) Functional recognition of 5'- splice site by U4/U6. U5 tri-snRNP defines a novel ATP-dependent step in early spliceosome assembly. *Molecular Cell*, **6**, 317–328.
- Marques, A.C., Vinckenbosch, N., Brawand, D., and Kaessmann, H. (2008) Functional diversification of duplicate genes through subcellular adaptation of encoded proteins. *Genome Biology*, **9**, R54.
- Marques-Bonet, T., Girirajan, S., and Eichler, E. E. (2009) The origins and impact of primate segmental duplications. *Trends in Genetics*, **25**, 443–454.
- Marquina, D., Santos, A., and Peinado, J.M. (2002) Biology of killer yeasts. *International Microbiology*, **5**, 65–71.
- Marres, C.A., de Vries, S., and Grivell, L.A. (1991) Isolation and inactivation of the nuclear gene encoding the rotenone-insensitive internal NADH: ubiquinone oxidoreductase of mitochondria from *Saccharomyces cerevisiae*. *European Journal of Biochemistry*, **195**, 857–862.
- Marshall, O.J., Chueh, A.C., Wong, L.H., and Choo, K.H. (2008) Neocentromeres, new insights into centromere structure, disease development, and karyotype evolution. *American Journal of Human Genetics*, **82**, 261–282.
- Marston, A.L. and Amon, A. (2004) Meiosis: cell-cycle controls shuffle and deal. *Nature Reviews Molecular Cell Biology*, **5**, 983–997.
- Martchenko, M., Levitin, A., Hogues, H., Nantel, A., and Whiteway, M. (2007) Transcriptional rewiring of fungal galactose-metabolism circuitry. *Current Biology*, **17**, 1007–1013.
- Martin, D.E. and Hall, M.N. (2005) The expanding TOR signaling network. *Current Opinion in Cell Biology*, **17**, 158–166 (review).
- Martin, R., Sibley, A.P., Schneller, J.M., Keith, G., Stahl, A.J.C., and Dirheimer, G. (1978) Primary structure of yeast mitochondrial DNA-coded phenylalanine-tRNA. *Nucleic Acids Research*, **5**, 4579–4592.
- Martin, A., Schneider, S., and Schwer, B. (2002) Prp43 is an essential RNA-dependent ATPase required for release of lariat-intron from the spliceosome. *The Journal of Biological Chemistry*, **277**, 17743–17750.
- Martin, N., Ruedi, E.A., Leduc, R., Sun, F.J., and Caetano-Anolles, G. (2007) Gene-interleaving patterns of synteny in the *Saccharomyces cerevisiae* genome, are they proof of an ancient genome duplication event? *Biology Direct*, **2**, 23.
- Martin, G., Doublé, S., and Keller, W. (2008) Determinants of substrate specificity in RNA-dependent nucleotidyl transferases. *Biochimica et Biophysica Acta*, **1779**, 206–216 (review).
- Martineau, C.N., Le Dall, M.T., Melki, R., Beckerich, J.M., and Kabani, M. (2012) Molecular and functional characterization of the only known hemiascomycete ortholog of the carboxyl terminus of Hsc70-interacting protein CHIP in the yeast *Yarrowia lipolytica*. *Cell Stress & Chaperones*, **17**, 229–241.
- Martinez, J.L., Sychrova, H., and Ramos, J. (2011) Monovalent cations regulate expression and activity of the Hak1 potassium transporter in *Debaryomyces hansenii*. *Fungal Genetics and Biology*, **48**, 177–184.
- Martinez-Pastor, M.T., Marchler, G., Schuller, C., Marchler-Bauer, A., Ruis, H., and Estruch, F. (1996) The *Saccharomyces cerevisiae* zinc finger proteins Msn2p and Msn4p are required for transcriptional induction through the stress response element (STRE). *The EMBO Journal*, **15**, 2227–2235.
- Martschenko, M., Levitin, M., Hogues, H., Nantel, A., and Whiteway, M. (2007) Transcriptional rewiring of fungal galactose-metabolism circuitry. *Current Biology*, **17**, 1007–1013.
- Martzen, M.R., McCraith, S.M., Spinelli, F.M. *et al.* (1999) A biochemical genomics approach for identifying genes by the activity of their products. *Science*, **286**, 1153–1155.
- Marx, H., Mecklenbräuker, A., Gasser, B., Sauer, M., and Mattanovich, D. (2009) Directed gene copy number amplification in *Pichia pastoris* by vector integration into the ribosomal DNA locus. *FEMS Yeast Research*, **9**, 1260–1270.
- Marz, U. (2011) Report Code: CHM053A, BBC Research Market forecasting, www.bbcresearch.com.
- Marzioch, M., Erdmann, R., Veenhuis, M., and Kunau, W.H. (1994) PAS7 encodes a novel yeast member of the WD-40 protein family essential for import of 3-oxoacyl-CoA thiolase, a PTS2-containing protein, into peroxisomes. *The EMBO Journal*, **13**, 4908–4918.
- Marzluf, G.A. (1997) Genetic regulation of nitrogen metabolism in the fungi. *Microbiology and Molecular Biology Reviews*, **61**, 17–32.
- Marzouki, N., Camier, S., Ruet, A., Moenne, A., and Sentenac, A. (1986) Selective proteolysis defines two DNA binding domains in yeast transcription factor tau. *Nature*, **323**, 176–178.
- Masai, H., Taniyama, C., Oginio, K. *et al.* (2006) Phosphorylation of MCM4 by Cdc7 kinase facilitates its interaction with Cdc45 on the chromatin. *The Journal of Biological Chemistry*, **281**, 39249–39261.
- Masison, D.C. and Wickner, R.B. (1995) Prion-inducing domain of yeast Ure2p and protease resistance of Ure2p in prion-containing cells. *Science*, **270**, 93–95.
- Masison, D.C., Kirkland, P.A., and Sharma, D. (2009) Influence of Hsp70s and their regulators on yeast prion propagation. *Prion*, **3**, 65–73.
- Mason, D.L. and Michaelis, S. (2002) Requirement of the N-terminal extension for vacuolar trafficking and transport activity of yeast Ycf1p, an ATP-binding cassette transporter. *Molecular Biology of the Cell*, **13**, 4443–4455.
- Massey, S.E., Moura, G., Beltrao, P. *et al.* (2003) Comparative evolutionary genomics unveils the molecular mechanism of reassignment of the CTG codon in *Candida* spp. *Genome Research*, **13**, 544–557.
- Massoud, T.F., Paulmurugan, R., De, A., Ray, P., and Gambhir, S.S. (2007) Reporter gene imaging of protein–protein interactions in living subjects. *Current Opinion in Biotechnology*, **18**, 31–37.
- Mast, F.D., Fagarasanu, A., Knobloch, B., and Rachubinski, R.A. (2010) Peroxisome biogenesis, something old, something new, something borrowed. *Physiology (Bethesda)*, **25**, 347–356.
- Mata, J. and Nurse P. (1998) Discovering the poles in yeast. *Trends in Cell Biology*, **8**, 163–167. Review.
- Mathias, N., Johnson, S., Winey, M. *et al.* (1996) Cdc53p acts in concert with Cdc4p and Cdc34p to control the G₁-to-S-phase transition and identifies a conserved family of proteins. *Molecular and Cellular Biology*, **16**, 6634–6643.
- Matsui, T., Segall, J., Weil, P.A., and Roeder, R. G. (1980) Multiple factors required for accurate initiation of transcription by purified RNA polymerase II. *The Journal of Biological Chemistry*, **255**, 11992–11996.

- Matsumoto, T., Fukuda, H., Ueda, M., Tanaka, A., and Kondo, A. (2002) Construction of yeast strains with high cell surface lipase activity by using novel display systems based on the Flo1p flocculation functional domain. *Applied and Environmental Microbiology*, **68**, 4517–4522.
- Matsumoto, T., Ito, M., Fukuda, H., and Kondo, A. (2004) Enantioselective transesterification using lipase-displaying yeast whole-cell biocatalyst. *Applied Microbiology and Biotechnology*, **64**, 481–485.
- Matsuoka, K., Morimitsu, Y., Uchida, K., and Schekman, R. (1998a) Coat assembly directs v-SNARE concentration into synthetic COPII vesicles. *Molecular Cell*, **2**, 703–708.
- Matsuoka, K., Orci, L., Amherdt, M. *et al.* (1998b) COPII-coated vesicle formation reconstituted with purified coat proteins and chemically defined liposomes. *Cell*, **93**, 263–275.
- Matsuoka, K., Schekman, R., Orci, L., and Heuser, J.E. (2001) Surface structure of the COPII-coated vesicle. *Proceedings of the National Academy of Sciences of the United States of America*, **98**, 13705–13709.
- Matsushika, A., Inoue, H., Kodaki, T., and Sawayama, S. (2009) Ethanol production from xylose in engineered *Saccharomyces cerevisiae* strains: current state and perspectives. *Applied Microbiology and Biotechnology*, **84**, 37–53.
- Mattaj, I. (1998) Nuclear transport of tRNA. *Current Biology*, **8**, 305–309.
- Mattanovich, D., Callewaert, N., Rouzé, P., Lin, Y.C., Graf, A., Redl, A., Tiels, P., Gasser, B., and De Schutter, K. (2009a). HYPERLINK “http://www.ncbi.nlm.nih.gov/pubmed/19835590” Open access to sequence: browsing the *Pichia pastoris* genome. *Microb Cell Fact.*, **8**, 53.
- Mattanovich, D., Graf, A., Stadlmann, J. *et al.* (2009a) Genome, secretome and glucose transport highlight unique features of the protein production host *Pichia pastoris*. *Microbial Cell Factories*, **8**, 29.
- Mattanovich, D., Callewaert, N., Rouzé, P. *et al.* (2009b) Open access to sequence: browsing the *Pichia pastoris* genome. *Microbial Cell Factories*, **8**, 53.
- Mattanovich, D., Branduardi, P., Dato, L., Gasser, B., Sauer, M., and Porro, D. (2011) Recombinant protein production in yeasts. *Applied Microbiology and Biotechnology*, **89**, 939–948 (review).
- Mattila, P.K., Quintero-Monzon, O., Kugler, J. *et al.* (2004) A high-affinity interaction with ADP-actin monomers underlies the mechanism and *in vivo* function of Srv2/ cyclase-associated protein. *Molecular Biology of the Cell*, **15**, 5158–5171.
- Matunis, M.J., Wu, J., and Blobel, G. (1998) SUMO-1 modification and its role in targeting the Ran GTPase-activating protein, RanGAP1, to the nuclear pore complex. *The Journal of Cell Biology*, **140**, 499–509.
- Matz, M.V., Fradkov, A.F., Labas, Y.A. *et al.* (1999) Fluorescent proteins from non-bioluminescent *Anthozoa* species. *Nature Biotechnology*, **17**, 969–973.
- Mavrich, T.N., Ioshikhes, I.P., Venters, B.J. *et al.* (2008) A barrier nucleosome model for statistical positioning of nucleosomes throughout the yeast genome. *Genome Research*, **18**, 1073–1083.
- Maxam, A.M. and Gilbert, W. (1977) A new method for sequencing DNA. *Proceedings of the National Academy of Sciences of the United States of America*, **74**, 560–564.
- Mayer, T.U., Braun, T., and Jentsch, S. (1998) Role of the proteasome in membrane extraction of a short-lived ER-transmembrane protein. *The EMBO Journal*, **17**, 3251–3257.
- Mayer, A., Lidschreiber, M., Siebert, M., Leike, K., Soding, J., and Cramer, P. (2010) Uniform transitions of the general RNA polymerase II transcription complex. *Nature Structural & Molecular Biology*, **17**, 1272–1278.
- Mayinger, P. (2009) Regulation of Golgi function via phosphoinositide lipids. *Seminars in Cell & Developmental Biology*, **20**, 793–800.
- Maytal-Kivity, V., Piran, R., Pick, E., Hofmann, K., and Glickman, M.H. (2002) COP9 signalosome components play a role in the mating pheromone response of *S. cerevisiae*. *EMBO Reports*, **3**, 1215–1221.
- Mazurie, A., Bottani, S., and Vergassola, M. (2005) An evolutionary and functional assessment of regulatory network motifs. *Genome Biology*, **6**, R35.
- McCarthy, J.E.G. (1998) Posttranscriptional control of gene expression in yeast. *Microbiology and Molecular Biology Reviews*, **62**, 1492–1553.
- McClain, W.H. (1993) Rules that govern tRNA identity in protein synthesis. *Journal of Molecular Biology*, **234**, 257–280.
- McEachern, M.J. and Blackburn, E.H. (1994) A conserved sequence motif within the exceptionally diverse telomeric sequences of budding yeasts. *Proceedings of the National Academy of Sciences of the United States of America*, **91**, 3453–3457.
- McEachern, M.J. and Haber, J.E. (2006) Break-induced replication and recombinational telomere elongation in yeast. *Annual Review of Biochemistry*, **75**, 111–135.
- McGrath, J.P., Jentsch, S., and Varshavsky, A. (1991) *UBA1*: an essential yeast gene encoding ubiquitin-activating enzyme. *The EMBO Journal*, **10**, 227–236.
- McGuinness, B.E., Hirota, T., Kudo, N.R., Peters, J.M., and Nasmyth, K. (2005) Shugoshin prevents dissociation of cohesin from centromeres during mitosis in vertebrate cells. *PLoS Biology*, **3**, e86.
- McInerney, C.J., Partridge, J.F., Mikesell, G.E., Creemer, D.P., and Breeden, L.L. (1997) A novel Mcm1-dependent element in the *SWI4*, *CLN3*, *CDC6*, and *CDC47* promoters activates M/G₁-specific transcription. *Genes and Development*, **11**, 1277–1288.
- McIsaac, R.S., Silverman, S.J., McClean, M.N. *et al.* (2011) Fast-acting and nearly gratuitous induction of gene expression and protein depletion in *Saccharomyces cerevisiae*. *Molecular Biology of the Cell*, **22**, 4447–4459.
- McLaughlin, C.S. and Hartwell, L.H. (1969) Mutants of yeast defective in the initiation of protein biosynthesis. *Cold Spring Harbor Symposia on Quantitative Biology*, **34**, 317–319.
- McLaughlin, C.S., Warner, J.R., Edmonds, M., Nakazato, H., and Vaughan, M.H. (1973) Polyadenylic acid sequences in yeast messenger ribonucleic acid. *The Journal of Biological Chemistry*, **248**, 1466–1471.
- McMurray, M.A. and Gottschling, D.E. (2003) An age-induced switch to hyper-recombinational state. *Science*, **301**, 1908–1911.
- McMurray, M.A. and Gottschling, D.E. (2004) Genetic instability in aging yeast, a metastable hyperrecombinational state. *Cold Spring Harbor Symposia on Quantitative Biology*, **69**, 339–348.
- McNeil, J.B. and Smith, M. (1985) *Saccharomyces cerevisiae* *CYC1* mRNA 5'-end positioning: analysis by *in vitro* mutagenesis, using synthetic duplexes with random mismatch base pairs. *Molecular and Cellular Biology*, **5**, 3545–3551.
- McNew, J.A., Sogaard, M., Lampen, N.M. *et al.* (1997) Ykt6p, a prenylated SNARE essential for endoplasmic reticulum–Golgi transport. *The Journal of Biological Chemistry*, **272**, 17776–17783.
- McPheeters, D.S. and Abelson, J. (1992) Mutational analysis of the yeast U2 snRNA suggests a structural similarity to the catalytic core of group I introns. *Cell*, **71**, 819–831.
- McPheeters, D.S. and Muhlenkamp, P. (2003) Spatial organization of protein–RNA interactions in the branch site-3/splice site region during pre-mRNA splicing in yeast. *Molecular and Cellular Biology*, **23**, 4174–4186.
- McQuibban, G.A., Saurya, S., and Freeman, M. (2003) Mitochondrial membrane remodelling regulated by a conserved rhomboid protease. *Nature*, **423**, 537–541.
- Medicherla, B., Kostova, Z., Schaefer, A., and Wolf, D.H. (2004) A genomic screen identifies Dsk2p and Rad23p as essential components of ER-associated degradation. *EMBO Reports*, **5**, 692–697.
- Meimaridou, E., Gooljar, S.B., and Chapple, J.P. (2009) From hatching to dispatching: the multiple cellular roles of the Hsp70 molecular chaperone machinery. *Journal of Molecular Endocrinology*, **42**, 1–9.
- Meinecke, M., Cismowski, C., Schliebs, W. *et al.* (2010) The peroxisomal importomer constitutes a large and highly dynamic pore. *Nature Cell Biology*, **12**, 273–277.
- Meinhart, A. and Cramer, P. (2004) Recognition of RNA polymerase II carboxy-terminal domain by 3'-RNA processing factors. *Nature*, **430**, 223–226.
- Meisinger, C., Wiedemann, N., Rissler, M. *et al.* (2006) Mitochondrial protein sorting: differentiation of β -barrel assembly by Tom7-mediated segregation of Mdm10. *The Journal of Biological Chemistry*, **281**, 22819–22826.
- Meisterernst, M. and Roeder, R.G. (1991) Family of proteins that interact with TFIID and regulate promoter activity. *Cell*, **67**, 557–567.
- Mekouar, M., Blanc-Lenfle, I., Ozanne, C. *et al.* (2010) Detection and analysis of alternative splicing in *Yarrowia lipolytica* reveal structural constraints facilitating nonsense-mediated decay of intron-retaining transcripts. *Genome Biology*, **11**, R65.
- Melake, T., Passoth, V., and Klinner, U. (1996) Characterization of the genetic system of the xylose-fermenting yeast *Pichia stipitis*. *Current Microbiology*, **33**, 237–242.
- Melchior, F., Schergaut, M., and Pichler, A. (2003) SUMO: ligases, isopeptidases and nuclear pores. *Trends in Biochemical Sciences*, **28**, 612–618.

- Mellor, J. and Morillon, A. (2004) ISWI complexes in *Saccharomyces cerevisiae*. *Biochimica et Biophysica Acta*, **1677**, 100–112 (review).
- Mellor, J., Fulton, S.M., Dobson, M.J., Wilson, W., Kingsman, S.M., and Kingsman, A.J. (1985) A retrovirus-like strategy for expression of a fusion protein encoded by yeast transposon Ty1. *Nature*, **313**, 243–246.
- Melo, A.M., Bandejas, T.M., and Teixeira, M. (2004) New insights into type II NAD(P)H: quinone oxidoreductases. *Microbiology and Molecular Biology Reviews*, **68**, 603–616.
- Memet, S., Saurin, W., and Sentenac, A. (1988) RNA polymerases B and C are more closely related to each other than to RNA polymerase A. *The Journal of Biological Chemistry*, **263**, 10048–10051.
- Menezes, R.A., Amaral, C., Delaunay, A., Toledano, M., and Rodrigues-Pousada, C. (2004) Yap8p activation in *Saccharomyces cerevisiae* under arsenic conditions. *FEBS Letters*, **566**, 141–146.
- Menezes, R.A., Amaral, C., Batista-Nascimento, L. et al. (2008) Contribution of Yap1 towards *Saccharomyces cerevisiae* adaptation to arsenic-mediated oxidative stress. *The Biochemical Journal*, **414**, 301–311.
- Mennella, T.A., Klinkenberg, L.G., and Zitomer, R.S. (2003) Recruitment of Tup1–Ssn6 by yeast hypoxic genes and chromatin-independent exclusion of TATA binding protein. *Eukaryotic Cell*, **2**, 1288–1303.
- Meraldi, P., McAinsh, A.D., Rheinbay, E., and Sorger, P.K. (2006) Phylogenetic and structural analysis of centromeric DNA and kinetochore proteins. *Genome Biology*, **7**, R23.
- Merico, A., Sulo, P., Piskur, J., and Compagno, C. (2007) Fermentative lifestyle in yeasts belonging to the *Saccharomyces* complex. *FEBS Journal*, **274**, 976–989.
- Merico, A., Galafassi, S., Piskur, J., and Compagno, C. (2009) The oxygen level determines the fermentation pattern in *Kluyveromyces lactis*. *FEMS Yeast Research*, **9**, 749–756.
- Merlet, J., Burger, J., Gomes, J.E., and Pintard, L. (2009) Regulation of cullin-RING E3 ubiquitin-ligases by neddylation and dimerization. *Cellular and Molecular Life Sciences*, **66**, 1924–1938.
- Merrick, W.C. and Hershey, J.W.B. (1996) The pathway and mechanism of eukaryotic protein synthesis, in *Translational Control* (eds J.W.B. Hershey, M.B. Matthews, and N. Sonenberg), Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, pp. 31–70.
- Mesecke, N., Terziyska, N., Kozany, C. et al. (2005) A disulfide relay system in the intermembrane space of mitochondria that mediates protein import. *Cell*, **121**, 1059–1069.
- Messenguy, F. and Dubois, E. (1993) Genetic evidence for a role for Mcm1 in the regulation of arginine metabolism in *Saccharomyces cerevisiae*. *Molecular and Cellular Biology*, **13**, 2586–2592.
- Messenguy, F. and Dubois, E. (2000) Control of arginine metabolism in yeast. *Food Technology and Biotechnology*, **38**, 277–285.
- Messenguy, F., Dubois, E., and Descamps, F. (1986) Nucleotide sequence of the ARGRII regulatory gene and amino acid sequence homologies between ARGRII, PPR1 and GAL4 regulatory proteins. *European Journal of Biochemistry*, **157**, 77–81.
- Messenguy, F., Dubois, E., and Boonchird, C. (1991) Determination of the DNA-binding sequences of ARGRII proteins to arginine anabolic and catabolic promoters. *Molecular and Cellular Biology*, **11**, 2852–2863.
- Messenguy, F. (1987) Multiplicity of regulatory mechanisms controlling amino acid biosynthesis in *Saccharomyces cerevisiae*. *Microbiological Sciences*, **4**, 150–153.
- Meyer, H.H., Shorter, J.G., Seemann, J., Pappin, D., and Warren, G. (2000) A complex of mammalian Ufd1 and Npl4 links the AAA-ATPase, p97, to ubiquitin and nuclear transport pathways. *The EMBO Journal*, **19**, 2181–2192.
- Meyer, P., Prodromou, C., Liao, C. et al. (2004) Structural basis for recruitment of the ATPase activator Aha1 to the Hsp90 chaperone machinery. *The EMBO Journal*, **23**, 1402–1410.
- Meyer, H.H. (2005) Golgi reassembly after mitosis: the AAA family meets the ubiquitin family. *Biochimica et Biophysica Acta*, **1744**, 481–492 (review).
- Miceli, M.H., Diaz, J.A., and Lee, S.A. (2011) Emerging opportunistic yeast infections. *Lancet Infectious Diseases*, **11**, 142–151.
- Michaelis, C., Ciosk, R., and Nasmyth, K. (1997) Cohesins: chromosomal proteins that prevent premature separation of sister chromatids. *Cell*, **91**, 35–45.
- Michel, F. and Dujon, B. (1983) Conservation of RNA secondary structures in two intron families including mitochondrial-, chloroplast- and nuclear-encoded members. *The EMBO Journal*, **2**, 33–38.
- Michel, F. and Ferat, J.L. (1995) Structure and activities of group II introns. *Annual Review of Biochemistry*, **64**, 435–461.
- Michel, F. and Westhoff, E. (1990) Modelling the three-dimensional architecture of group I catalytic introns based on comparative sequence analysis. *Journal of Molecular Biology*, **216**, 585–610.
- Michel, J.J., McCarville, J.F. and Xiong, Y. (2003) A role for *Saccharomyces cerevisiae* Cul8 ubiquitin ligase in proper anaphase progression. *The Journal of Biological Chemistry*, **278**, 22828–22837.
- Michels, C.A., Read, E., Nat, K., Charron, M.J. (1992) The telomere-associated MAL3 locus of *Saccharomyces* is a tandem array of repeated genes. *Yeast*, **8**, 655–665.
- Micklem, G., Rowley, A., Harwood, J., Nasmyth, K., and Diffley, J.F. (1993) Yeast origin recognition complex is involved in DNA replication and transcriptional silencing. *Nature*, **366**, 87–89.
- Micolonghi, C., Wesolowski-Louvel, M., and Bianchi, M.M. (2011) The Rag4 glucose sensor is involved in the hypoxic induction of KIPDC1 gene expression in the yeast *Kluyveromyces lactis*. *Eukaryotic Cell*, **10**, 146–148.
- Middelhoven, W.J., Coenen, A., Kraakman, B., and Sollewijn Gelpke, M.D. (1992) Degradation of some phenols and hydroxybenzoates by the imperfect ascomycetous yeasts *Candida parapsilosis* and *Arxula adeninivorans*, evidence for an operative gentisate pathway. *Antonie van Leeuwenhoek*, **62**, 181–187.
- Mihalik, A. and Csermely, P. (2011) Heat shock partially dissociates the overlapping modules of the yeast protein–protein interaction network: a systems level model of adaptation. *PLoS Computational Biology*, **7**, e1002187.
- Mihara, K. and Blobel, G. (1980) The four cytoplasmically made subunits of yeast mitochondrial cytochrome *c* oxidase are synthesized individually and not as a polyprotein. *Proceedings of the National Academy of Sciences of the United States of America*, **77**, 4160–4164.
- Mihara, K., Blobel, G., and Sato, R. (1982) *In vitro* synthesis and integration into mitochondria of porin, a major protein of the outer mitochondrial membrane of *Saccharomyces cerevisiae*. *Proceedings of the National Academy of Sciences of the United States of America*, **79**, 102–106.
- Milenkovic, D., Kozjak, V., Wiedemann, N. et al. (2004) Sam35 of the mitochondrial protein sorting and assembly machinery is a peripheral outer membrane protein essential for cell viability. *The Journal of Biological Chemistry*, **279**, 22781–22785.
- Milisa, I., Moro, F., Neupert, W., and Brunner, M. (2001) Modular structure of the TIM23 preprotein translocase of mitochondria. *The Journal of Biological Chemistry*, **276**, 25856–25861.
- Miller, J. and Gordon, C. (2005) The regulation of proteasome degradation by multi-ubiquitin chain binding proteins. *FEBS Letters*, **579**, 3224–3230.
- Miller, P.F. and Hinnebusch, A.G. (1989) Sequences that surround the stop codons of upstream open reading frames in GCN4 mRNA determine their distinct functions in translational control. *Genes and Development*, **3**, 1217–1225.
- Miller, R.K., Cheng, S.C., and Rose, M.D. (2000) Bim1p/Yeb1p mediates the Kar9p-dependent cortical attachment of cytoplasmic microtubules. *Molecular Biology of the Cell*, **11**, 2949–2959.
- Miller, C., Schwalb, B., Maier, K. et al. (2011) Dynamic transcriptome analysis measures rates of mRNA synthesis and decay in yeast. *Molecular Systems Biology*, **7**, 458.
- Miller-Fleming, L., Giorgini, F., and Outeiro, T. F. (2008) Yeast as a model for studying human neurodegenerative disorders. *Journal of Biotechnology*, **3**, 325–338 (review).
- Millon, L., Reboux, G., Drobacheff, C. et al. (1997) Multiple isolations of *Kluyveromyces lactis* from oral cavity of HIV-infected patients. *Journal de Mycologie Medicale*, **7**, 28–32.
- Minhas, A., Biswas, D., and Mondal, A.K. (2009) Development of host and vector for high-efficiency transformation and gene disruption in *Debaryomyces hansenii*. *FEMS Yeast Research*, **9**, 95–102.
- Minvielle-Sebastia, L. and Keller, W. (1999) mRNA polyadenylation and its coupling to other RNA processing reactions and to transcription. *Current Opinion in Cell Biology*, **11**, 352–357 (review).
- Miranda, I., Silva, R., and Santos, M.A.S. (2006) Evolution of the genetic code in yeasts. *Yeast (Chichester, England)*, **23**, 203–213.

- Misawa, N. (2011) Pathway engineering for functional isoprenoids. *Current Opinion in Biotechnology*, **22**, 627–633 (review).
- Mitchell, P. and Tollervey, D. (2001) mRNA turnover. *Current Opinion in Cell Biology*, **13**, 320–325.
- Mitchell, P. and Tollervey, D. (2003) An NMD pathway in yeast involving accelerated deadenylation and exosome mediated 3' → 5' degradation. *Molecular Cell*, **11**, 1405–1413.
- Mitchell, P., Petfalski, E., Shevchenko, A., Mann, M., and Tollervey, D. (1997) The exosome: a conserved eukaryotic RNA processing complex containing multiple 3' → 5' exoribonucleases. *Cell*, **91**, 457–466.
- Mitchell, M., Xue, S., Erdman, R., Randau, L., Söll, D., and Li, H. (2009) Crystal structure and assembly of the functional Nanoarchaeum equitans tRNA splicing endonuclease. *Nucleic Acids Res.*, **37**, 5793–5802.
- Mitchell, S.F., Walker, S.E., Algire, M.A. *et al.* (2010) The 5'-7-methylguanosine cap on eukaryotic mRNAs serves both to stimulate canonical translation initiation and block an alternative pathway. *Molecular Cell*, **39**, 950–962.
- Mitchison, J.M. (ed.) (1971) *The Biology of the Cell Cycle*, Cambridge University Press, Cambridge.
- Mitra, G. and Warner, J.R. (1984) A yeast ribosomal protein gene whose intron is in the 5' leader. *The Journal of Biological Chemistry*, **259**, 9218–9224.
- Mitrovich, Q.M. and Guthrie, C. (2007) Evolution of small nuclear RNAs in *S. cerevisiae*, *C. albicans*, and other hemiascomycetous yeasts. *RNA (New York, NY)*, **13**, 2066–2080.
- Miyahara, K., Hirata, D., and Miyakawa, T. (1996) yAP-1- and yAP-2-mediated, heat shock-induced transcriptional activation of the multidrug resistance ABC transporter genes in *Saccharomyces cerevisiae*. *Current Genetics*, **29**, 103–105.
- Mizuguchi, G., Shen, X., Landry, J., Wu, W.H., Sen, S., and Wu, C. (2004) ATP-driven exchange of histone H2AZ variant catalyzed by SWR1 chromatin remodeling complex. *Science*, **303**, 343–348.
- Mizuta, K., Tsujii, R., Warner, J.R., and Nishiyama, M. (1998) The C-terminal silencing domain of Rap1p is essential for the repression of ribosomal protein genes in response to a defect in the secretory pathway. *Nucleic Acids Research*, **26**, 1063–1069.
- Mlickova, K., Luo, Y., d'Andrea, S. *et al.* (2004a) Acyl-CoA oxidase, a key step for lipid accumulation in the yeast *Yarrowia lipolytica*. *Journal of Molecular Catalysis B: Enzymatic*, **28**, 81–85.
- Mlickova, K., Roux, E., Athenstaedt, K. *et al.* (2004b) Lipid accumulation, lipid body formation, and acyl coenzyme A oxidases of the yeast *Yarrowia lipolytica*. *Applied and Environmental Microbiology*, **70**, 3918–3924.
- Müller, S., Hoeghe, C., Pyrowolakis, G., and Jentsch, S. (2001) SUMO, ubiquitin's mysterious cousin. *Nature Reviews Molecular Cell Biology*, **2**, 202–210.
- Müller, H., Hennequin, C., Dujon, B., and Fairhead, C. (2007) Ascomycetes, the *Candida* MAT locus. Comparing MAT in the genomes of hemiascomycetous yeasts, in *Sex in Fungi: Molecular Determination and Evolutionary Implications* (eds J. Heitmann, J.W. Kronstad, J.W. Taylor, and L.A. Casselton), American Society for Microbiology, Washington, DC, pp. 185–201.
- Müller, H., Hennequin, C., Gallaud, J., Dujon, B., and Fairhead, C. (2008) The asexual yeast *Candida glabrata* maintains distinct α and α haploid mating types. *Eukaryotic Cell*, **7**, 848–858.
- Müller, H., Thierry, A., Coppée, J.Y. *et al.* (2009) Genomic polymorphism in the population of *Candida glabrata*: gene copy number variation and chromosomal translocations. *Fungal Genetics and Biology*, **46**, 264–276.
- Mnaimneh, S., Davierwala, A.P., Haynes, J. *et al.* (2004) Exploration of essential gene functions via titratable promoter alleles. *Cell*, **118**, 31–44.
- Moazed, D., Rudner, A.D., Huang, J., Hoppe, G. J., and Tanny, J.C. (2004) A model for step-wise assembly of heterochromatin in yeast. *Novartis Foundation Symposium*, **259**, 48–56 (review).
- Mockli, N., Deplazes, A., Hassa, P.O. *et al.* (2007) Yeast split-ubiquitin-based cytosolic screening system to detect interactions between transcriptionally active proteins. *Biotechniques*, **42**, 725–730.
- Moenne, A., Camier, S., Anderson, G., Margottin, F., Beggs, J., and Sentenac, A. (1990) The U6 gene of *Saccharomyces cerevisiae* is transcribed by RNA polymerase C (III) *in vivo* and *in vitro*. *The EMBO Journal*, **9**, 271–277.
- Mok, J., Im, H., and Snyder, M. (2009) Global identification of protein kinase substrates by protein microarray analysis. *Nature Protocols*, **4**, 1820–1827.
- Mokranjac, D., Paschen, S.A., Kozany, C. *et al.* (2003a) Tim50, a novel component of the TIM23 preprotein translocase of mitochondria. *The EMBO Journal*, **22**, 816–825.
- Mokranjac, D., Sichtung, M., Neupert, W., and Hell, K. (2003b) Tim14, a novel key component of the import motor of the TIM23 protein translocase of mitochondria. *The EMBO Journal*, **22**, 4945–4956.
- Molenaar, C.M., Prange, R., and Gallwitz, D. (1988) A carboxyl-terminal cysteine residue is required for palmitic acid binding and biological activity of the ras-related yeast YPT1 protein. *The EMBO Journal*, **7**, 971–976.
- Moller, K., Bro, C., Piskur, J., Nielsen, J., and Olsson, L. (2002a) Steady-state and transient-state analyses of aerobic fermentation in *Saccharomyces kluyveri*. *FEMS Yeast Research*, **2**, 233–244.
- Moller, K., Christensen, B., Forster, J., Piskur, J., Nielsen, J., and Olsson, L. (2002b) Aerobic glucose metabolism of *Saccharomyces kluyveri*: growth, metabolite production, and quantification of metabolic fluxes. *Biotechnology and Bioengineering*, **77**, 186–193.
- Moller, K., Langkjaer, R.B., Nielsen, J., Piskur, J., and Olsson, L. (2004) Pyruvate decarboxylases from the petite-negative yeast *Saccharomyces kluyveri*. *Molecular Genetics and Genomics*, **270**, 558–568.
- Monier, R., Stephenson, M.L., and Zamecnik, P. C. (1960) The preparation and some properties of a low molecular weight ribonucleic acid from baker's yeast. *Biochimica et Biophysica Acta*, **43**, 1.
- Monteilhet, C., Perrin, A., Thierry, A., Colleaux, L., and Dujon, B. (1990) Purification and characterization of the *in vitro* activity of I-Sce I, a novel and highly specific endonuclease encoded by a group I intron. *Nucleic Acids Research*, **18**, 1407–1413.
- Montgomery, D.L., Hall, B.D., Gillam, S., and Smith, M. (1978) Identification and isolation of the yeast cytochrome *c* gene. *Cell*, **14**, 673–680.
- Montgomery, D.L., Leung, D.W., Smith, M., Shalit, P., Faye, G., and Hall, B.D. (1980) Isolation and sequence of the gene for iso-2-cytochrome *c* in *Saccharomyces cerevisiae*. *Proceedings of the National Academy of Sciences of the United States of America*, **77**, 541–545.
- Moon, A.L., Janney, P.A., Louie, K.A., and Drubin, D.G. (1993) Cofilin is an essential component of the yeast cortical cytoskeleton. *The Journal of Cell Biology*, **120**, 421–435.
- Moore, M.S. and Blobel, G. (1995) Soluble factors required for nuclear protein import. *Cold Spring Harbor Symposia on Quantitative Biology*, **60**, 701–705.
- Moore, J.K. and Cooper, J.A. (2010) Coordinating mitosis with cell polarity: molecular motors at the cell cortex. *Seminars in Cell & Developmental Biology*, **21**, 283–289.
- Moore, J.K., Stuchell-Brereton, M.D., and Cooper, J.A. (2009) Function of Dynein in Budding Yeast: Mitotic Spindle Positioning in a Polarized Cell. *Cell Motil Cytoskeleton*, **66**, 546–555.
- Moore, J.K., Stuchell-Brereton, M.D., and Cooper, J.A. (2009) Function of dynein in budding yeast: mitotic spindle positioning in a polarized cell. *Cell Motility and the Cytoskeleton*, **66**, 546–555.
- Moqtaderi, Z. and Struhl, K. (2004) Genome-wide occupancy profile of the RNA polymerase III machinery in *Saccharomyces cerevisiae* reveals loci with incomplete transcription complexes. *Molecular and Cellular Biology*, **24**, 4118–4127.
- Moras, D., Lorber, B., Romby, P. *et al.* (1983) Yeast tRNA^{Asp}-aspartyl-tRNA synthetase: the crystalline complex. *Journal of Biomolecular Structure & Dynamics*, **1**, 209–223 (review).
- Moreno, S., Hayles, J., and Nurse, P. (1989) Regulation of p34^{cdc2} protein kinase during mitosis. *Cell*, **58**, 361–372.
- Moreno-Borchart, A.C. and Knop, M. (2003) Prospore membrane formation: how budding yeast gets shaped in meiosis. *Microbiological Research*, **158**, 83–90.
- Moretti, P., Freeman, K., Coodly, L., and Shore, D. (1994) Evidence that a complex of SIR proteins interacts with the silencer and telomere-binding protein RAP1. *Genes and Development*, **8**, 2257–2269.
- Morillon, A., Karabetsov, N., O'Sullivan, J., Kent, N., Proudfoot, N., and Mellor, J. (2003a) Isw1 chromatin remodeling ATPase coordinates transcription elongation and termination by RNA polymerase II. *Cell*, **115**, 425–435.
- Morillon, A., O'Sullivan, J., Azad, A., Proudfoot, N., and Mellor, J. (2003b) Regulation of elongating RNA polymerase II by forkhead transcription factors in yeast. *Science*, **300**, 492–495.
- Morin, M., Cescut, J., Beopoulos, A. *et al.* (2011) Transcriptomic analyses during the transition

- from biomass production to lipid accumulation in the oleaginous yeast *Yarrowia lipolytica*. *PLoS One*, **6**, e27966.
- Moriya, H. and Johnston, M. (2004) Glucose sensing and signaling in *Saccharomyces cerevisiae* through the Rgt2 glucose sensor and casein kinase I. *Proceedings of the National Academy of Sciences of the United States of America*, **101**, 1572–1577.
- Moro, F., Okamoto, K., Donzeau, M., Neupert, W., and Brunner, M. (2002) Mitochondrial protein import: molecular basis of the ATP-dependent interaction of MthSp70 with Tim44. *The Journal of Biological Chemistry*, **277**, 6874–6880.
- Morris, M.C., Kaiser, P., Rudyak, S., Baskerville, C., Watson, M.H., and Reed, S.I. (2003) Cks1-dependent proteasome recruitment and activation of CDC20 transcription in budding yeast. *Nature*, **423**, 1009–1013.
- Morrow, B.E., Ju, Q., and Warner, J.R. (1990) Purification and characterization of the yeast rDNA binding protein REB1. *The Journal of Biological Chemistry*, **265**, 20778–20783.
- Morse, R.H. (1999) Analysis of DNA topology in yeast chromatin. *Methods in Molecular Biology (Clifton, NJ)*, **119**, 379–393 (review).
- Morse, R.H. (2000) RAP, RAP, open up! New wrinkles for RAP1 in yeast. *Trends in Genetics*, **16**, 51–53 (review).
- Morsomme, P. and Riezman, H. (2002) Rab GTPases (Ypt1p) is involved in the selection of cargo proteins that bud from the ER. *Developmental Cell*, **2**, 307–317.
- Morsomme, P., Prescianotto-Baschong, C., and Riezman, H. (2003) The ER v-SNAREs are required for GPI-anchored protein sorting from other secretory proteins upon exit from the ER. *The Journal of Cell Biology*, **162**, 403–412.
- Mortimer, R.K. and Hawthorne, D.C. (1966) Genetic mapping in *Saccharomyces*. *Genetics*, **53**, 165–173.
- Mortimer, R.K. and Schild, D. (1991) Genetic mapping in *Saccharomyces*, in *The Molecular and Cellular Biology of the Yeast Saccharomyces* (eds J.R. Broach, J.R. Pringle, and E.W. Jones), Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, pp. 11–26.
- Mortimer, R.K., Contopoulou, C.R., and King, J. S. (1992) Genetic and physical maps of *Saccharomyces cerevisiae*, Edition 11. *Yeast*, **8**, 817–902.
- Moseley, J.B. and Goode, B.L. (2006) The yeast actin cytoskeleton: from cellular function to biochemical mechanism. *Microbiol Mol Biol Rev.*, **70**, 605–645.
- Moseley, J.B. and Goode, B.L. (2006) The yeast actin cytoskeleton: from cellular function to biochemical mechanism. *Microbiology and Molecular Biology Reviews*, **70**, 605–645.
- Moses, A.M., Chiang, D.Y., Kellis, M., Lander, E. S., and Eisen, M.B. (2003) Position specific variation in the rate of evolution in transcription factor binding sites. *BMC Evolutionary Biology*, **3**, 19.
- Moses, A.M., Chiang, D.Y., Pollard, D.A., Iyer, V. N., and Eisen, M.B. (2004) MONKEY: identifying conserved transcription-factor binding sites in multiple alignments using a binding site-specific evolutionary model. *Genome Biology*, **5**, R98.
- Moses, A.M., Liku, M.E., Li, J.J., and Durbin, R. (2007) Regulatory evolution in proteins by turnover and lineage-specific changes of cyclin-dependent kinase consensus sites. *Proceedings of the National Academy of Sciences of the United States of America*, **104**, 17713–17718.
- Moskvina, E., Imre, E.M., and Ruis, H. (1999) Stress factors acting at the level of the plasma membrane induce transcription via the stress response element (STRE) of the yeast *Saccharomyces cerevisiae*. *Molecular Microbiology*, **32**, 1263–1272.
- Mosrin, C., Riva, M., Beltrame, M., Cassar, E., Sentenac, A., and Thuriaux, P. (1990) The RPC31 gene of *Saccharomyces cerevisiae* encodes a subunit of RNA polymerase C (III) with an acidic tail. *Molecular and Cellular Biology*, **10**, 4737–4743.
- Mounolou, J.C., Jakob, H., and Slonimski, P.P. (1966) Mitochondrial DNA from yeast “petite” mutants: specific changes in buoyant density corresponding to different cytoplasmic mutations. *Biochemical and Biophysical Research Communications*, **24**, 218–224.
- Moy, T.I. and Silver, P.A. (2002) Requirements for the nuclear export of the small ribosomal subunit. *Journal of Cell Science*, **115**, 2985–2995.
- Mukherjee, S., Berger, M.F., Jona, G. *et al.* (2004) Rapid analysis of the DNA-binding specificities of transcription factors with DNA microarrays. *Nature Genetics*, **36**, 1331–1339.
- Mullally, J.E., Chernova, T., and Wilkinson, K.D. (2006) Doa1 is a Cdc48 adapter that possesses a novel ubiquitin binding domain. *Molecular and Cellular Biology*, **26**, 822–830.
- Muller, L.A.H. and McCusker, J.H. (2009) A multispecies-based taxonomic microarray reveals interspecies hybridization and introgression in *Saccharomyces cerevisiae*. *FEMS Yeast Research*, **9**, 143–152.
- Muniz, M., Morsomme, P. and Riezman, H. (2001) Protein sorting upon exit from the endoplasmic reticulum. *Cell*, **104**, 313–320.
- Murakami, H. and Nurse, P. (2000) DNA replication and damage checkpoints and meiotic cell cycle controls in the fission and budding yeasts. *The Biochemical Journal*, **349**, 1–12 (review).
- Murakami, H., Blobel, G., and Pain, D. (1990) Isolation and characterization of the gene for a yeast mitochondrial import receptor. *Nature*, **347**, 488–491.
- Murakami, Y., Naitou, M., Hagiwara, H. *et al.* (1995) Analysis of the nucleotide sequence of chromosome VI from *Saccharomyces cerevisiae*. *Nature Genetics*, **10**, 261–268.
- Muratani, M., Kung, C., Shokat, K.M., and Tansey, W.P. (2005) The F box protein Dsg1/Mdm30 is a transcriptional coactivator that stimulates Gal4 turnover and cotranscriptional mRNA processing. *Cell*, **120**, 887–899.
- Murawski, M., Szcześniak, B., Zożadek, T., Hopper, A.K., Martin, N.C., and Boguta, M. (1994) Maf1 mutation alters the subcellular localization of the Mod5 protein in yeast. *Acta Biochimica Polonica*, **41**, 441–448.
- Murphy, H.A. and Zeyl, C.W. (2010) Yeast sex; surprisingly high rates of outcrossing between asci. *PLoS One*, **5**, e10461.
- Murphy, H., Kuehne, H., Francis, C., and Sniegowski, P. (2006) Mate choice assays and mating propensity differences in natural yeast populations. *Biology Letters*, **2**, 553–556.
- Murray, J.M. and Carr, A.M. (2008) Smc5/6: a link between DNA repair and unidirectional replication? *Nature Reviews Molecular Cell Biology*, **9**, 177–182.
- Musso, G.A., Zhang, Z., and Emili, A. (2007) Experimental and computational procedures for the assessment of protein complexes on a genome-wide scale. *Chemical Reviews*, **107**, 3585–3600.
- Mutka, S.C., Bondi, S.M., Carney, J.R., Da Silva, N.A., and Kealey, J.T. (2006) Metabolic pathway engineering for complex polyketide biosynthesis in *Saccharomyces cerevisiae*. *FEMS Yeast Research*, **6**, 40–47.
- Myer, V.E. and Young, R.A. (1998) RNA polymerase II holoenzymes and subcomplexes. *The Journal of Biological Chemistry*, **273**, 27757–27760.
- Myers, L.C., Gustafsson, C.M., Bushnell, D.A. *et al.* (1999) The Med proteins of yeast and their function through the RNA polymerase II carboxy-terminal domain. *Genes and Development*, **12**, 45–54.
- Nagalakshmi, U., Wang, Z., Waern, K. *et al.* (2008) The transcriptional landscape of the yeast genome defined by RNA sequencing. *Science*, **320**, 1344–1349.
- Nagy, P.L., Cleary, M.L., Brown, P.O., and Lieb, J.D. (2003) Genomewide demarcation of RNA polymerase transcription units revealed by physical fractionation of chromatin. *Proceedings of the National Academy of Sciences of the United States of America*, **100**, 6364–6369.
- Nakafuku, M., Obara, T., Kaibuchi, K. *et al.* (1988) Isolation of a second yeast *Saccharomyces cerevisiae* gene (GPA2) coding for guanine nucleotide-binding regulatory protein: studies on its structure and possible functions. *Proceedings of the National Academy of Sciences of the United States of America*, **85**, 1374–1378.
- Nakai, Y., Nakai, M., Lill, R., Suzuki, T., and Hayashi, H. (2007) Thio modification of yeast cytosolic tRNA is an iron-sulfur protein-dependent pathway. *Molecular and Cellular Biology*, **27**, 2841–2847.
- Nakai, Y., Nakai, M., and Hayashi, H. (2008) Thio-modification of yeast cytosolic tRNA requires a ubiquitin-related system that resembles bacterial sulfur transfer systems. *The Journal of Biological Chemistry*, **283**, 27469–27476.
- Nakano, A., Brada, D., and Schekman, R. (1988) A membrane glycoprotein, Sec12p, required for protein transport from the endoplasmic reticulum to the Golgi apparatus in yeast. *The Journal of Cell Biology*, **107**, 851–863.
- Nakaño, A. and Muramatsu, M. (1989) A novel GTP-binding protein, Sar1p, is involved in transport from the endoplasmic reticulum to the Golgi apparatus. *Journal of Cell Biology*, **109**, 2677–2691.
- Nakao, Y., Kanamori, T., Itoh, T. *et al.* (2009) Genome sequence of the lager brewing yeast, an interspecies hybrid. *DNA Research*, **16**, 115–129.
- Nakase, M., Tani, M., Morita, T. *et al.* (2010) Mannosylinositol phosphorylceramide is a major sphingolipid component and is required for proper localization of

- plasma-membrane proteins in *Schizosaccharomyces pombe*. *Journal of Cell Science*, **123**, 1578–1587.
- Nakayama, K. and Wakatsuki, S. (2003) The structure and function of GGAs, the traffic controllers at the TGN sorting crossroads. *Cell Structure and Function*, **28**, 431–442.
- Namy, O., Duchateau-Nguyen, G., Hatin, I., Hermann-Le Denmat, S., Termier, M., and Rousset, J.P. (2003) Identification of stop codon readthrough genes in *Saccharomyces cerevisiae*. *Nucleic Acids Research*, **31**, 2289–2296.
- Narasimhan, M.L., Coca, M.A., Jin, J. *et al.* (2005) Osmotin is a homolog of mammalian adiponectin and controls apoptosis in yeast through a homolog of mammalian adiponectin receptor. *Molecular Cell*, **17**, 171–180.
- Nargang, F.E., Rapaport, D., Ritzel, R.G., Neupert, W., and Lill, R. (1998) Role of the negative charges in the cytosolic domain of TOM22 in the import of precursor proteins into mitochondria. *Molecular and Cellular Biology*, **18**, 3173–3181.
- Nasmyth, K.A. and Reed, S.I. (1980) Isolation of genes by complementation in yeast: molecular cloning of a cell-cycle gene. *Proceedings of the National Academy of Sciences of the United States of America*, **77**, 2119–2123.
- Nasmyth, K.A. and Tatchell, K. (1980) The structure of transposable yeast mating type loci. *Cell*, **19**, 753–764.
- Nasmyth, K., Seddon, A., and Ammerer, G. (1987) Cell cycle regulation of *SWI5* is required for mother-cell-specific *HO* transcription in yeast. *Cell*, **49**, 549–558.
- Nasmyth, K. (2001) Disseminating the genome: joining, resolving, and separating sister chromatids during mitosis and meiosis. *Annual Review of Genetics*, **35**, 673–745.
- Nasmyth, K. (2002) Segregating sister genomes: the molecular biology of chromosome separation. *Science*, **297**, 559–565 (review).
- Natsume, T. and Tanaka, T.U. (2010) Spatial regulation and organization of DNA replication within the nucleus. *Chromosome Research*, **18**, 7–17.
- Natsume, R., Eitoku, M., Akai, Y., Sano, N., Horikoshi, M., and Senda, T. (2007) Structure and function of the histone chaperone *CIA/ASF1* complexed with histones H3 and H4. *Nature*, **446**, 338–341.
- Naumov, G.I., Naumova, E.S., Masneuf-Pomarède, I. (2010) Genetic identification of new biological species *Saccharomyces arboricolus* Wang et Bai. *Antonie van Leeuwenhoek*, **98**, 1–7.
- Naumov, G.I. (1987) Genetic basis for classification and identification of the ascomycetous yeasts. *Studies in Mycology*, **30**, 469–475.
- Naumova, E.S., Naumov, G.I., Masneuf-Pomarède, I., and Aigle, M. (2005) Molecular genetic study of introgression between *Saccharomyces bayanus* and *S. cerevisiae*. *Yeast (Chichester, England)*, **22**, 1099–1115.
- Naumova, E.S., Naumov, G.I., Michailova, Y.V., Martynenko, N.N., and Masneuf-Pomarède, I. (2011) Genetic diversity study of the yeast *Saccharomyces bayanus* var. *ivarum* reveals introgressed subtelomeric *Saccharomyces cerevisiae* genes. *Research in Microbiology*, **162**, 204–213.
- Naumov, G.I., James, S.A., Naumova, E.S., Louis, E.J., and Roberts, I.N. (2000) Three new species in the *Saccharomyces sensu stricto* complex, *Saccharomyces cariocanus*, *Saccharomyces kudriavzevii* and *Saccharomyces mikatae*. *International Journal of Systematic and Evolutionary Microbiology*, **50**, 1931–1942.
- Navarrete, C., Siles, A., Martínez, J.L., Calero, F., and Ramos, J. (2009) Oxidative stress sensitivity in *Debaryomyces hansenii*. *FEMS Yeast Research*, **9**, 582–590.
- Nazarko, V.Y., Thevelein, J.M., and Sibirny, A.A. (2008) G-protein-coupled receptor Gpr1 and G-protein Gpa2 of cAMP-dependent signaling pathway are involved in glucose-induced pexophagy in the yeast *Saccharomyces cerevisiae*. *Cell Biology International*, **32**, 502–504.
- Necas, O. (1971) Cell wall synthesis in yeast protoplasts. *Bacteriological Reviews*, **35**, 149–170 (review).
- Nedea, E., He, X., Kim, M. *et al.* (2003) Organization and function of APT, a subcomplex of the yeast cleavage and polyadenylation factor involved in the formation of mRNA and small nucleolar RNA 3'-ends. *The Journal of Biological Chemistry*, **278**, 33000–33010.
- Neigeborn, L., Celenza, J.L., and Carlson, M. (1987) *SSN20* is an essential gene with mutant alleles that suppress defects in *SUC2* transcription in *Saccharomyces cerevisiae*. *Molecular and Cellular Biology*, **7**, 672–678.
- Nelisen, B., De Watcher, R., and Goffeau, A. (1997) Classification of all putative permeases and other membrane multispansers of the major facilitator superfamily encoded by the complete genome of *Saccharomyces cerevisiae*. *FEMS Microbiology Reviews*, **21**, 113–134.
- Nelson, N. (1989) Structure, molecular genetics, and evolution of vacuolar H⁺-ATPases. *Journal of Bioenergetics and Biomembranes*, **21**, 553–571 (review).
- Nelson, N. (2003) A journey from mammals to yeast with vacuolar H⁺-ATPase (V-ATPase). *Journal of Bioenergetics and Biomembranes*, **35**, 281–289 (review).
- Nemecek, J., Nakayashiki, T., and Wickner, R.B. (2009) A prion of yeast metacaspase homolog (Mca1p) detected by a genetic screen. *Proceedings of the National Academy of Sciences of the United States of America*, **106**, 1892–1896.
- Neumann, E., Schaefer-Ridder, M., Wang, Y., and Hofschneider, P.H. (1982) Gene transfer into mouse lymphoma cells by electroporation in high electric fields. *The EMBO Journal*, **1**, 841–845.
- Neupert, W. and Herrmann, J.M. (2007) Translocation of proteins into mitochondria. *Annu. Rev. Biochem.*, **76**, 723–749.
- Neupert, W. and Herrmann, J.M. (2007) Translocation of proteins into mitochondria. *Annual Review of Biochemistry*, **76**, 723–749.
- Neupert, W. and Pfanner, N. (1993) Roles of molecular chaperones in protein targeting to mitochondria. *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences*, **339**, 355–361 (review).
- Neupert, W. (1997) Protein import into mitochondria. *Annual Review of Biochemistry*, **66**, 863–917.
- Neuvéglise, C., Feldmann, H., Bon, E., Gaillardin, C., and Casarégola, S. (2002) Genomic evolution of the long terminal repeat retrotransposons in hemiascomycetous yeasts. *Genome Research*, **12**, 930–943.
- Neuvéglise, C., Chalvet, F., Wincker, P., Gaillardin, C., and Casarégola, S. (2005) Mutator-like element in the yeast *Yarrowia lipolytica* displays multiple alternative splicings. *Eukaryotic Cell*, **4**, 615–624.
- Neuvéglise, C., Marck, C., and Gaillardin, C. (2011) The intronome of budding yeasts. *Comptes Rendus Biologies*, **334**, 662–670.
- Neuwald, A.F., Aravind, L., Spouge, J.L., and Koonin, E.V. (1999) AAA⁺: a class of chaperone-like ATPases associated with the assembly, operation, and disassembly of protein complexes. *Genome Research*, **9**, 27–43.
- Nevitt, T. and Thiele, D.J. (2011) Host iron withholding demands siderophore utilization for *Candida glabrata* to survive macrophage killing. *PLoS Pathogenesis*, **7**, e1001322.
- Nevitt, T., Pereira, J., Azevedo, D., Guerreiro, P., and Rodrigues-Pousada, C. (2004) Expression of *YAP4* in *Saccharomyces cerevisiae* under osmotic stress. *The Biochemical Journal*, **379**, 367–374.
- Nevoigt, E. (2008) Progress in metabolic engineering of *Saccharomyces cerevisiae*. *Microbiology and Molecular Biology Reviews*, **72**, 379–412 (review).
- Newlon, C.S. and Theis, J.F. (1993) The structure and function of yeast ARS elements. *Current Opinion in Genetics & Development*, **3**, 752–758.
- Newlon, C.S. (1988) Yeast chromosome replication and segregation. *Microbiological Reviews*, **52**, 568–601.
- Newman, J.R., Ghaemmaghami, S., Ihmels, J. *et al.* (2006) Single cell proteomic analysis of *S. cerevisiae* reveals the architecture of biological noise. *Nature*, **441**, 840–846.
- Ng, R. and Abelson, J. (1980) Isolation and sequence of the gene for actin in *Saccharomyces cerevisiae*. *Proceedings of the National Academy of Sciences of the United States of America*, **77**, 3912–3916.
- Ng, H.H., Robert, F., Young, R.A., and Struhl, K. (2002) Genome-wide location and regulated recruitment of the RSC nucleosome-remodeling complex. *Genes and Development*, **16**, 806–819.
- Ng, H.H., Robert, F., Young, R.A., and Struhl, K. (2003) Targeted recruitment of Set1 histone methylase by elongating Pol II provides a localized mark and memory of recent transcriptional activity. *Molecular Cell*, **11**, 709–719.
- Ng, W., Sergeevko, T., Zeng, N., Brown, J.D., and Römisch, K. (2007) Characterization of the proteasome interaction with the Sec61 channel in the endoplasmic reticulum. *Journal of Cell Science*, **120**, 682–691.
- Nègre, N., Lavrov, S., Hennetin, J., Bellis, M., and Cavalli, G. (2006) Mapping the distribution of chromatin proteins by ChIP on chip. *Methods in Enzymology*, **410**, 316–341.
- Nguyen, C., Bolotin-Fukuhara, M., Wesolowski, M., and Fukuhara, H. (1995) The respiratory system of *Kluyveromyces lactis* escapes from Hap2 control. *Genetics*, **152**, 113–115.
- Nguyen, H.V., Gaillardin, C., and Neuvéglise, C. (2009) Differentiation of *Debaryomyces*

- hansenii* and *Candida famata* by rRNA gene intergenic spacer fingerprinting and reassessment of phylogenetic relationships among *D. hansenii*, *C. famata*, *D. fabryi*, *C. flaveri* (= *D. subglobosus*) and *D. prosopidis*, description of *D. vietnamensis* sp. nov. closely related to *D. nepalensis*. *FEMS Yeast Research*, **9**, 641–662.
- Nguyen, H.V., Legras, J.L., Neuvéglise, C., and Gaillardin, C. (2011) Deciphering the hybridization history leading to the lager lineage based on the mosaic genomes of *Saccharomyces bayanus* strains NBRC1948 and CBS380. *PLoS One*, **6**, e25821.
- Ni, L. and Snyder, M. (2001) A genomic study of the bipolar bud site selection pattern in *Saccharomyces cerevisiae*. *Molecular Biology of the Cell*, **12**, 2147–2170.
- Nickerson, D.P., Brett, C.L., and Merz, A.J. (2009) Vps-C complexes: gatekeepers of endolysosomal traffic. *Current Opinion in Cell Biology*, **21**, 543–551.
- Nickles, K. and McEachern, M.J. (2004) Characterization of *Kluyveromyces lactis* subtelomeric sequences including a distal element with strong purine/pyrimidine strand bias. *Yeast (Chichester, England)*, **21**, 813–830.
- Niedenthal, R.K., Riles, L., Johnston, M., and Hegemann, J.H. (1996) Green fluorescent protein as a marker for gene expression and subcellular localization in budding yeast. *Yeast*, **12**, 773–786.
- Niedenthal, R., Riles, L., Guldener, U., Klein, S., Johnston, M., and Hegemann, J.H. (1999) Systematic analysis of *S. cerevisiae* chromosome VIII genes. *Yeast (Chichester, England)*, **15**, 1775–1796.
- Nielsen, C.B., Friedman, B., Birren, B., Burge, C. B., and Galagan, J.E. (2004) Patterns of intron gain and loss in fungi. *PLoS Biology*, **2**, e422.
- Nielsen, J. (2009) System biology of lipid metabolism: from yeast to human. *FEBS Letters*, **583**, 3905–3913 (review).
- Nigam, J.N. (2001) Ethanol production from wheat straw hemicellulose hydrolysate by *Pichia stipitis*. *Journal of Biotechnology*, **87**, 17–27.
- Nigg, E.A. (1997) Nucleocytoplasmic transport: signals, mechanisms and regulation. *Nature*, **386**, 779–787.
- Nightingale, K.P., O'Neill, L.P., and Turner, B. M. (2006) Histone modifications: signalling receptors and potential elements of a heritable epigenetic code. *Current Opinion in Genetics & Development*, **16**, 125–136.
- Nikko, E. and André, B. (2007) Split-ubiquitin two-hybrid assay to analyze protein–protein interactions at the endosome: application to *Saccharomyces cerevisiae* Bro1 interacting with ESCRT complexes, the Doa4 ubiquitin hydrolase, and the Rsp5 ubiquitin ligase. *Eukaryotic Cell*, **6**, 1266–1277.
- Nilsen, T.W. (2003) The spliceosome: the most complex macromolecular machine in the cell? *Bioessays*, **25**, 1147–1149.
- Nilsson, B., Moks, T., Jansson, B. et al. (1987) A synthetic IgG-binding domain based on staphylococcal protein A. *Protein Engineering*, **1**, 107–113.
- Nilsson-Tillgren, T., Gjermansen, C., Kielland-Brandt, M.C. et al. (1981) Genetic differences between *Saccharomyces carlsbergensis* and *S. cerevisiae*. Analysis of chromosome III by single chromosome transfer. *Carlsberg Research Communication*, **46**, 65–76.
- Nissan, T.A., Bassler, J., Petfalski, E., Tollervey, D., and Hurt, E.C. (2002) 60S pre-ribosome formation viewed from assembly in the nucleolus until export to the cytoplasm. *The EMBO Journal*, **21**, 5539–5547.
- Nissan, T.A., Galani, K., Maco, B., Tollervey, D., Aebi, U., and Hurt, E. (2004) A pre-ribosome with a tadpole-like structure functions in ATP-dependent maturation of 60S subunits. *Molecular Cell*, **15**, 295–301.
- Niu, T.K., Pfeifer, A.C., Lippincott-Schwartz, J., Jackson, C.L. (2005) Dynamics of GBF1, a Brefeldin A-sensitive Arf1 exchange factor at the Golgi. *Molecular Biology of the Cell*, **16**, 1213–1222.
- Nolden, M., Ehses, S., Koppen, M., Bernacchia, A., Rugarli, E.I., and Langer, T. (2006) The m-AAA protease defective in hereditary spastic paraplegia controls ribosome assembly in mitochondria. *Cell*, **123**, 277–289.
- Nonet, M.L. and Young, R.A. (1989) Intragenic and extragenic suppressors of mutations in the heptapeptide repeat domain of *Saccharomyces cerevisiae* RNA polymerase II. *Genetics*, **123**, 715–724.
- Nordle, A.K., Rios, P., Gaulton, A., Pulido, R., Attwood, T.K., and Taberner, L. (2007) Functional assignment of MAPK phosphatase domains. *Proteins*, **69**, 19–31.
- Nosek, J., Tomaska, L., Bolotin-Fukuhara, M., and Miyakawa, I. (2006) Mitochondrial chromosome structure: an insight from analysis of complete yeast genomes. *FEMS Yeast Research*, **6**, 356–370 (review).
- Nothwang, H.G., Coux, O., Bey, F., and Scherrer, K. (1992) Prosomes and their multicatalytic proteinase activity. *European Journal of Biochemistry*, **207**, 621–630.
- Novick, P. and Schekman, R. (1979) Secretion and cell-surface growth are blocked in a temperature-sensitive mutant of *Saccharomyces cerevisiae*. *Proceedings of the National Academy of Sciences of the United States of America*, **76**, 1858–1862.
- Novick, P., Field, C., and Schekman, R. (1980) Identification of 23 complementation groups required for post-translational events in the yeast secretory pathway. *Cell*, **21**, 205–215.
- Novick, P., Ferro, S., and Schekman, R. (1981) Order of events in the yeast secretory pathway. *Cell*, **25**, 461–469.
- Novo, M., Bigey, F., Beyne, E. et al. (2009) Eukaryote-to-eukaryote gene transfer events revealed by the genome sequence of the wine yeast *Saccharomyces cerevisiae* EC1118. *Proceedings of the National Academy of Sciences of the United States of America*, **106**, 16333–16338.
- Nurse, P. and Bissett, Y. (1981) Gene required in G₁ for commitment to cell cycle and in G₂ for control of mitosis in fission yeast. *Nature*, **292**, 558–560.
- Nurse, P. and Thuriaux, P. (1980) Regulatory genes controlling mitosis in the fission yeast *Schizosaccharomyces pombe*. *Genetics*, **96**, 627–637.
- Nurse, P., Thuriaux, P., and Nasmyth, K. (1976) Genetic control of the cell division cycle in the fission yeast *S. pombe*. *Molecular & General Genetics*, **146**, 167–178.
- Nurse, P. (1990) Universal control mechanism regulating onset of M-phase. *Nature*, **344**, 503–508.
- Nurse, P. (2000) A long twentieth century of the cell cycle and beyond. *Cell*, **100**, 71–78.
- Nurse, P.M. (2001) *Cyclin dependent kinases and cell cycle control. Nobel Lecture*, http://nobelprize.org/nobel_prizes/medicine/laureates/2001/nurse-lecture.html.
- Oakes, M., Siddiqi, I., Vu, L., Aris, J., and Nomura, M. (1999) Transcription factor UAF, expansion and contraction of ribosomal DNA (rDNA) repeats, and RNA polymerase switch in transcription of yeast rDNA. *Molecular and Cellular Biology*, **19**, 8559–8569.
- O'Connell, B.C. and Harper, J.W. (2007) Ubiquitin proteasome system (UPS): what can chromatin do for you? *Current Opinion in Cell Biology*, **19**, 206–214.
- O'Connor-Cox, E.S.C., Lodolo, E.J., and Axcell, B.C. (1996) Mitochondrial relevance to yeast fermentation performance. *Journal of the Institute of Brewing*, **102**, 19–25.
- Odds, F.C. (2010) Molecular phylogenetics and epidemiology of *Candida albicans*. *Future Microbiology*, **5**, 67–79.
- O'Donnell, A.F., Apffel, A., Gardner, R.G., and Cyert, M.S. (2010) α -Arrestins Aly1 and Aly2 regulate intracellular trafficking in response to nutrient signaling. *Molecular Biology of the Cell*, **21**, 3552–3566.
- Ogawa, N., DeRisi, J., and Brown, P.O. (2000) New components of a system for phosphate accumulation and polyphosphate metabolism in *Saccharomyces cerevisiae* revealed by genomic expression analysis. *Molecular Biology of the Cell*, **11**, 4309–4321.
- Ogden, R.C., Knapp, G., Peebles, C.L. et al. (1980) Enzymatic removal of intervening sequences in the synthesis of yeast tRNAs, in *Transfer RNA – Biological Aspects* (eds D. Söll, J.N. Abelson, and P.R. Schimmel), Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, pp. 173–190.
- Ogura, T. and Wilkinson, A.J. (2001) AAA⁺ superfamily ATPases: common structure – diverse function. *Genes to Cells*, **6**, 575–597.
- Oh, S.D., Lao, J.P., Taylor, A.F., Smith, G.R., and Hunter, N. (2008) RecQ helicase, Sgs1, and XPF family endonuclease, Mus81–Mms4, resolve aberrant joint molecules during meiotic recombination. *Molecular Cell*, **31**, 324–336.
- Ohi, M.D., Vander Kooi, C.W., Rosenberg, J.A. et al. (2005) Structural and functional analysis of essential pre-mRNA splicing factor Prp19p. *Molecular and Cellular Biology*, **25**, 451–460.
- Ohkuma, M., Kobayashi, K., Kawai, S., Hwang, C.W., Ohta, A., and Takagi, M. (1995a) Identification of a centromeric activity in the autonomously replicating TRA region allows improvement of the host-vector system for *Candida maltosa*. *Molecular & General Genetics*, **249**, 447–455.
- Ohkuma, Y., Hashimoto, S., Wang, C.K., Horikoshi, M., and Roeder, R.G. (1995b) Analysis of the role of TFIIE in basal transcription and TFIIF-mediated carboxy-terminal domain phosphorylation through structure–function studies of TFIIE- α . *Molecular and Cellular Biology*, **15**, 4856–4866.
- Ohno, S. (1970) *Evolution by Gene Duplication*, Springer, Berlin.
- Ohshima, Y., Itoh, M., Okada, N., and Miyata, T. (1981) Novel models for RNA splicing that involve a small nuclear RNA. *Proceedings of the*

- National Academy of Sciences of the United States of America*, **78**, 4471–4474.
- Ohsumi, Y. (1999) Molecular mechanism of autophagy in yeast, *Saccharomyces cerevisiae*. *Philosophical Transactions of the Royal Society of London Series B-Biological Sciences*, **354**, 1577–1580. Review.
- Ohta, T., Michel, J.J., Schottelius, A.J., and Xiong, Y. (1999) ROC1, a homolog of APC11, represents a family of cullin partners with an associated ubiquitin ligase activity. *Molecular Cell*, **3**, 535–541.
- Oku, M. and Sakai, Y. (2008) Pexophagy in *Pichia pastoris*. *Methods in Enzymology*, **451**, 217–228.
- Okuda, Y., Sasaki, D., Nogami, S., Kaneko, Y., Ohya, Y., and Anraku, Y. (2003) Occurrence, horizontal transfer and degeneration of VDE intein family in Saccharomycete yeasts. *Yeast (Chichester, England)*, **20**, 563–573.
- Olazabal, I.M. and Machesky, L.M. (2001) Abp1p and cactin, new “hand-holds” for actin. *The Journal of Cell Biology*, **154**, 679–682.
- Olesen, J., Hahn, S., and Guarente, L. (1987) Yeast HAP2 and HAP3 activators both bind to the *CYC1* upstream activation site, UAS2, in an interdependent manner. *Cell*, **51**, 953–961.
- Oliphant, A.R., Brandl, C.J., and Struhl, K. (1989) Defining the sequence specificity of DNA-binding proteins by selecting binding sites from random-sequence oligonucleotides: analysis of yeast *GCN4* protein. *Molecular and Cellular Biology*, **9**, 2944–2949.
- Oliver, S.G., van der Aart, Q.J., Agostoni-Carbone, M.L. et al. (1992) The complete nucleotide sequence of yeast chromosome III. *Nature*, **357**, 38–46.
- Oliver, S.G. (1996) From DNA sequence to biological function. *Nature*, **379**, 597–600.
- Olofsson, K., Runquist, D., Hahn-Hägerdal, B., and Lidén, G. (2011) A mutated xylose reductase increases bioethanol production more than a glucose/xylose facilitator in simultaneous fermentation and co-fermentation of wheat straw. *AMB Express*, **1**, 4.
- Olson, M.V., Montgomery, D.L., Hopper, A.K., Page, G.S., Horodyski, F., and Hall, B.D. (1977) Molecular characterisation of the tyrosine tRNA genes of yeast. *Nature*, **267**, 639–641.
- Ong, S.E., Blagoev, B., Kratchmarova, I. et al. (2002) Stable isotope labeling by amino acids in cell culture, SILAC, as a simple and accurate approach to expression proteomics. *Molecular & Cellular Proteomics*, **1**, 376–386.
- Onischenko, E.A., Stanton, L.H., Madrid, A.S., Kieselbach, T., and Weis, K. (2009) Role of the NDC1-interaction network in yeast nuclear pore complex assembly and maintenance. *The Journal of Cell Biology*, **185**, 475–491.
- Onoda, F., Takeda, M., Seki, M. et al. (2004) SMC6 is required for MMS-induced interchromosomal and sister chromatid recombinations in *Saccharomyces cerevisiae*. *DNA Repair*, **3**, 429–439.
- Ooi, S.L., Shoemaker, D.D., and Boeke, J.D. (2003) DNA helicase gene interaction network defined using synthetic lethality analyzed by microarray. *Nature Genetics*, **35**, 277–286.
- Orci, L., Glick, B.S., and Rothman, J.E. (1986) A new type of coated vesicular carrier that appears not to contain clathrin: its possible role in protein transport within the Golgi stack. *Cell*, **46**, 171–184.
- Orci, L., Stamnes, M., Ravazzola, M., Amherdt, M., Perrelet, A., Söllner, T.H., and Rothman, J.E. (1997) Bidirectional transport by distinct populations of COPI-coated vesicles. *Cell*, **90**, 335–349.
- Orlean, P. and Menon, A.K. (2007) GPI anchoring of protein in yeast and mammalian cells, or: how we learned to stop worrying and love glycosphospholipids. *Journal of Lipid Research*, **48**, 993–1011.
- O'Rourke, S.M. and Herskowitz, I. (1998) The Hog1 MAPK prevents cross talk between the HOG and pheromone response MAPK pathways in *Saccharomyces cerevisiae*. *Genes and Development*, **12**, 2874–2886.
- O'Rourke, S.M., Herskowitz, I., and O'Shea, E. K. (2002) Yeast go the whole HOG for the hyperosmotic response. *Trends in Genetics*, **18**, 405–412.
- Ortolan, T.G., Tongaonkar, P., Lambertson, D., Chen, L., Schaubert, C., and Madura, K. (2000) The DNA repair protein rad23 is a negative regulator of multi-ubiquitin chain assembly. *Nature Cell Biology*, **2**, 601–608.
- Osada, S., Sutton, A., Muster, N. et al. (2001) The yeast SAS (something about silencing) protein complex contains a MYST-type putative acetyltransferase and functions with chromatin assembly factor ASF1. *Genes and Development*, **15**, 3155–3168.
- Osborn, A.J. and Elledge, S.J. (2003) Mrc1 is a replication fork component whose phosphorylation in response to DNA replication stress activates Rad53. *Genes and Development*, **17**, 1755–1767.
- O'Shea, E.K. and Herskowitz, I. (2000) The ins and outs of cell-polarity decisions. *Nature Cell Biology*, **2**, E39–E41.
- Osley, M.A., Fleming, A.B., Kao, C.F. (2006) Histone ubiquitylation and the regulation of transcription. *Results and Problems in Cell Differentiation*, **41**, 47–75. Review.
- Osley, M.A. (2006) Regulation of histone H2A and H2B ubiquitylation. *Briefings in Functional Genomics and Proteomics*, **5**, 179–189.
- Ossig, R., Dascher, C., Trepte, H.H., Schmitt, H.D., and Gallwitz, D. (1991) The yeast *SLY* gene products, suppressors of defects in the essential GTP-binding Ypt1 protein, may act in endoplasmic reticulum-to-Golgi transport. *Molecular and Cellular Biology*, **11**, 2980–2993.
- Ossig, R., Laufer, W., Schmitt, H.D., and Gallwitz, D. (1995) Functionality and specific membrane localization of transport GTPases carrying C-terminal membrane anchors of synaptobrevin-like proteins. *The EMBO Journal*, **14**, 3645–3653.
- Ostergaard, S., Olsson, L., and Nielsen, J. (2000) Metabolic engineering of *Saccharomyces cerevisiae*. *Microbiology and Molecular Biology Reviews*, **64**, 34–50.
- Osterlund, T., Nookaew, I., and Nielsen, J. (2011) Fifteen years of large scale metabolic modeling of yeast: developments and impacts. *Biotechnology Advances*, Epub ahead of print (review).
- Ostling, J., Carlberg, M., and Ronne, H. (1996) Functional domains in the Mig1 repressor. *Molecular and Cellular Biology*, **16**, 753–761.
- Oswald, M., Fischer, M., Dirninger, N., and Karst, F. (2007) Monoterpenoid biosynthesis in *Saccharomyces cerevisiae*. *FEMS Yeast Research*, **7**, 413–421.
- Ota, I.M. and Varshavsky, A. (1993) A yeast protein similar to bacterial two-component regulators. *Science*, **262**, 566–569.
- Otto, C., Yovkova, V., and Barth, G. (2011) Overproduction and secretion of α -ketoglutaric acid by microorganisms. *Applied Microbiology and Biotechnology*, **92**, 689–695.
- Ou, S.H., Wu, F., Harrich, D., García-Martínez, L.F., and Gaynor, R.B. (1995) Cloning and characterization of a novel cellular protein, TDP-43, that binds to human immunodeficiency virus type 1 TAR DNA sequence motifs. *Journal of Virology*, **69**, 3584–3596.
- Outeiro, T.F. and Giorgini, F. (2006) Yeast as a drug discovery platform in Huntington's and Parkinson's diseases. *Journal of Biotechnology*, **1**, 258–269 (review).
- Outeiro, T.F. and Lindquist, S. (2003) Yeast cells provide insight into alpha-synuclein biology and pathobiology. *Science*, **302**, 1772–1775.
- Outeiro, T.F. and Muchowski, P.J. (2004) Molecular genetics approaches in yeast to study amyloid diseases. *Journal of Molecular Neuroscience*, **23**, 49–60 (review).
- Outeiro, T.F., Putcha, P., Tetzlaff, J.E. et al. (2008) Formation of toxic oligomeric α -synuclein species in living cells. *PLoS One*, **3**, e1867.
- Overkamp, K.M., Bakker, B.M., Kötter, P. et al. (2000) *In vivo* analysis of the mechanisms for oxidation of cytosolic NADH by *Saccharomyces cerevisiae* mitochondria. *Journal of Bacteriology*, **182**, 2823–2830.
- Owsianik, G., Balzi, E.L., and Ghislain, M. (2002) Control of 26S proteasome expression by transcription factors regulating multidrug resistance in *Saccharomyces cerevisiae*. *Molecular Microbiology*, **43**, 1295–1308.
- Owsianowski, E., Walter, D., and Fahrenkrog, B. (2008) Negative regulation of apoptosis in yeast. *Biochimica et Biophysica Acta*, **1783**, 1303–1310.
- Ozcan, S., Dover, J., Rosenwald, A.G., Wolff, S., and Johnston, M. (1996a) Two glucose transporters in *Saccharomyces cerevisiae* are glucose sensors that generate a signal for induction of gene expression. *Proceedings of the National Academy of Sciences of the United States of America*, **93**, 12428–12432.
- Ozcan, S., Leong, T., and Johnston, M. (1996b) Rgt1 of *S. cerevisiae*, a regulator of glucose-induced genes, is both an activator and a repressor of transcription. *Molecular and Cellular Biology*, **16**, 6419–6426.
- Ozkaynak, E., Finley, D., and Varshavsky, A. (1984) The yeast ubiquitin gene: head-to-tail repeats encoding a polyubiquitin precursor protein. *Nature*, **312**, 663–666.
- Ozsarac, N., Bhattacharyya, M., Dawes, I.W., and Clancy, M.J. (1995) The *SPR3* gene encodes a sporulation-specific homologue of the yeast CDC3/10/11/12 family of bud neck microfilaments and is regulated by ABFI. *Genetics*, **164**, 157–162.
- Padgett, R.A., Hardy, S.F., and Sharp, P.A. (1983) Splicing of adenovirus RNA in a cell-free transcription system. *Proceedings of the National Academy of Sciences of the United States of America*, **80**, 5230–5234.
- Padgett, R.A., Konarska, M.M., Grabowski, P.J., Hardy, S.F., and Sharp, P.A. (1984) Lariat RNA's as intermediates and products in the

- splicing of messenger RNA precursors. *Science*, **225**, 898–903.
- Padgett, R.A., Grabowski, P.J., Konarska, M.M., Seiler, S., and Sharp, P.A. (1986) Splicing of messenger RNA precursors. *Annual Review of Biochemistry*, **55**, 1119–1150.
- Pahlman, I.L., Larsson, C., Averét, N. *et al.* (2002) Kinetic regulation of the mitochondrial glycerol-3-phosphate dehydrogenase by the external NADH dehydrogenase in *Saccharomyces cerevisiae*. *The Journal of Biological Chemistry*, **277**, 27991–27995.
- Pain, D., Murakami, H., and Blobel, G. (1990) Identification of a receptor for protein import into mitochondria. *Nature*, **347**, 444–449.
- Pajic, A., Tauer, R., Feldmann, H., Neupert, W., and Langer, T. (1994) Yta10p is required for the ATP-dependent degradation of polypeptides in the inner membrane of mitochondria. *FEBS Letters*, **353**, 201–206.
- Pak, J. and Segall, J. (2002) Regulation of the premiddle and middle phases of expression of the *NDT80* gene during sporulation of *Saccharomyces cerevisiae*. *Molecular and Cellular Biology*, **22**, 6417–6429.
- Pal, B., Chan, N.C., Helfenbaum, L., Tan, K., Tansey, W.P., and Gething, M.J. (2007) SCFCdc4-mediated degradation of the Hac1p transcription factor regulates the unfolded protein response in *Saccharomyces cerevisiae*. *Molecular Biology of the Cell*, **18**, 426–440.
- Palade, G. (1975) Intracellular aspects of the process of protein synthesis. *Science*, **189**, 347–358.
- Palancade, B., Zuccolo, M., Loeillet, S., and Nicolas, A. (2005) Pml39, a novel protein of the nuclear periphery required for nuclear retention of improper messenger ribonucleoproteins. *Molecular Biology of the Cell*, **6**, 5258–5268.
- Pal-Bhadra, M., Leibovitch, B.A., Gandhi, S.G. *et al.* (2004) Heterochromatic silencing and HP1 localization in *Drosophila* are dependent on the RNAi machinery. *Science*, **303**, 669–672.
- Palladino, F. and Gasser, S.M. (1994) Telomere maintenance and gene repression, a common end? *Current Opinion in Cell Biology*, **6**, 373–379.
- Palma, M., Goffeau, A., Spencer-Martins, I., and Baret, P.V. (2007) A phylogenetic analysis of the sugar porters in hemiascomycetous yeasts. *Journal of Molecular Microbiology and Biotechnology*, **12**, 241–248.
- Pan, X. and Heitman, J. (2002) Protein kinase A operates a molecular switch that governs yeast pseudohyphal differentiation. *Molecular and Cellular Biology*, **22**, 3981–3993.
- Panaretou, B. and Piper, P. (1996) *Isolation of yeast plasma membranes. Methods in Molecular Biology (Clifton, NJ)*, **53**, 117–121.
- Pannala, V.R., Bhartiya, S., and Venkatesh, K.V. (2010) Experimental and steady-state analysis of the GAL regulatory system in *Kluyveromyces lactis*. *FEBS Journal*, **277**, 2987–3002.
- Panzeri, L., Landonio, L., Stotz, A., and Philippsen, P. (1985) Role of conserved sequence elements in yeast centromere DNA. *The EMBO Journal*, **4**, 1867–1874.
- Papamichos-Chronakis, M., Conlan, R.S., Gounalaki, N., Copf, T., and Tzamarias, D. (2000) Hrs1/Med3 is a Cyc8–Tup1 corepressor target in the RNA polymerase II holoenzyme. *The Journal of Biological Chemistry*, **275**, 8397–8403.
- Papanikou, E. and Glick, B.S. (2009) The yeast Golgi apparatus: insights and mysteries. *FEBS Letters*, **583**, 3746–3751.
- Papp, B., Pal, C., and Hurst, L.D. (2003) Evolution of *cis*-regulatory elements in duplicated genes of yeast. *Trends Genetics*, **19**, 417–422.
- Parent, S.A., Fenimore, C.M., and Bostian, K.A. (1985) Vector systems for the expression, analysis and cloning of DNA sequences in *S. cerevisiae*. *Yeast*, **1**, 83–138. Review.
- Park, H.O., Chant, J., and Herskowitz, I. (1993) *BUD2* encodes a GTPase-activating protein for Bud1/Rsr1 necessary for proper bud-site selection in yeast. *Nature*, **365**, 269–274.
- Park, H.O., Bi, E., Pringle, J.R., and Herskowitz, I. (1997) Two active states of the Ras-related Bud1/Rsr1 protein bind to different effectors to determine yeast cell polarity. *Proceedings of the National Academy of Sciences of the United States of America*, **94**, 4463–4468.
- Park, H.O., Sanson, A., and Herskowitz, I. (1999) Localization of Bud2p, a GTPase-activating protein necessary for programming cell polarity in yeast to the presumptive bud site. *Genes and Development*, **13**, 1912–1917.
- Park, J.H., Jensen, B.C., Kifer, C.T., and Parsons, M. (2001) A novel nucleolar G-protein conserved in eukaryotes. *Cell Science*, **114**, 173–185.
- Park, E.Y., Ito, Y., Nariyama, M., Sugimoto, T., Lies, D., and Kato, T. (2011) The improvement of riboflavin production in *Ashbya gossypii* via disparity mutagenesis and DNA microarray analysis. *Applied Microbiology and Biotechnology*, **91**, 1315–1326.
- Parker, C.S. and Roeder, R.G. (1977) Selective and accurate transcription of the *Xenopus laevis* 5S RNA genes in isolated chromatin by purified RNA polymerase III. *Proceedings of the National Academy of Sciences of the United States of America*, **74**, 44–48.
- Parker, C.S., Jaehning, J.A., and Roeder, R.G. (1978) Faithful gene transcription by eukaryotic RNA polymerases in reconstructed systems. *Cold Spring Harbor Symposia on Quantitative Biology*, **42**, 577–587.
- Parlati, F., Dominguez, M., Bergeron, J.J., and Thomas, D.Y. (1995) *Saccharomyces cerevisiae* CNE1 encodes an endoplasmic reticulum (ER) membrane protein with sequence similarity to calnexin and calreticulin and functions as a constituent of the ER quality control apparatus. *The Journal of Biological Chemistry*, **270**, 244–253.
- Parlati, F., McNew, J.A., Fukuda, R., Miller, R., Sollner, T.H., and Rothman, J.E. (2000) Topological restriction of SNARE-dependent membrane fusion. *Nature*, **407**, 194–198.
- Parlati, F., Varlamov, O., Paz, K. *et al.* (2002) Distinct SNARE complexes mediating membrane fusion in Golgi transport based on combinatorial specificity. *Proceedings of the National Academy of Sciences of the United States of America*, **99**, 5424–5429.
- Parsell, D.A., Kowal, A.S., Singer, M.A., and Lindquist, S. (1994) Protein disaggregation mediated by heat-shock protein Hsp104. *Nature*, **372**, 475–478.
- Parsons, A.B., Geyer, R., Hughes, T.R., and Boone, C. (2003) Yeast genomics and proteomics in drug discovery and target validation. *Progress in Cell Cycle Research*, **5**, 159–166 (review).
- Paschen, S.A., Waizenegger, T., Stan, T. *et al.* (2003) Evolutionary conservation of biogenesis of beta-barrel membrane proteins. *Nature*, **426**, 862–866.
- Pascual-García, P., Govind, C.K., Queralt, E. *et al.* (2008) Sus1 is recruited to coding regions and functions during transcription elongation in association with SAGA and TREX2. *Genes and Development*, **22**, 2811–2822.
- Pascual-García, P. and Rodríguez-Navarro, S. (2009) A tale of coupling, Sus1 function in transcription and mRNA export. *RNA Biology*, **6**, 141–144.
- Patel, S. and Latterich, M. (1998) The AAA team: related ATPases with diverse functions. *Trends in Cell Biology*, **8**, 65–71 (review).
- Patel, S.S., Belmont, B.J., Sante, J.M., and Rexach, M.F. (2007) Natively unfolded nucleoporins gate protein diffusion across the nuclear pore complex. *Cell*, **129**, 83–96.
- Patel, B.K., Gavin-Smyth, J., and Liebman, S.W. (2009) The yeast global transcriptional corepressor protein Cyc8 can propagate as a prion. *Nature Cell Biology*, **11**, 344–349.
- Patil, C. and Walter, P. (2001) Intracellular signalling from the endoplasmic reticulum to the nucleus: the unfolded protein response in yeast and mammals. *Current Opinion in Cell Biology*, **13**, 349–355.
- Patil, K.R., Akesson, M., and Nielsen, J. (2004) Use of genome-scale microbial models for metabolic engineering. *Current Opinion in Biotechnology*, **15**, 64–69.
- Patton, E.E., Willems, A.R., and Tyers, M. (1998a) Combinatorial control in ubiquitin-dependent proteolysis: don't Skp the F-box hypothesis. *Trends in Genetics*, **14**, 236–243.
- Patton, E.E., Willems, A.R., Sa, D. *et al.* (1998b) Cdc53 is a scaffold protein for multiple Cdc34/Skp1/F-box protein complexes that regulate cell division and methionine biosynthesis in yeast. *Genes and Development*, **12**, 692–705.
- Paulovich, A.G., Toczyski, D.P., and Hartwell, L.H. (1997) When checkpoints fail. *Cell*, **88**, 315–321.
- Paulsen, I.T., Sliwinski, M.K., Nelissen, B., Goffeau, A., and Saier, M.H. Jr (1998) Unified inventory of established and putative transporters encoded within the complete genome of *Saccharomyces cerevisiae*. *FEBS Letters*, **430**, 116–125 (review).
- Paulus, H. (2000) Protein splicing and related forms of protein autoprocessing. *Annual Review of Biochemistry*, **69**, 447–496 (review).
- Paumet, F., Brugger, B., Parlati, F., McNew, J.A., Sollner, T.H., and Rothman, J.E. (2001) A t-SNARE of the endocytic pathway must be activated for fusion. *The Journal of Cell Biology*, **155**, 961–968.
- Paumet, F., Rahimian, V., and Rothman, J.E. (2004) The specificity of SNARE-dependent fusion is encoded in the SNARE motif. *Proceedings of the National Academy of Sciences of the United States of America*, **101**, 3376–3380.
- Paumi, C.M., Menendez, J., Arnoldo, A. *et al.* (2007) Mapping protein–protein interactions for the yeast ABC transporter Ycf1p by integrated split-ubiquitin membrane yeast two-hybrid analysis. *Molecular Cell*, **26**, 15–25.
- Paushkin, S.V., Kushnirov, V.V., Smirnov, V.N., and Ter-Avanesyan, M.D. (1996) Propagation

- of the yeast prion-like [PSI⁺] determinant is mediated by oligomerization of the SUP35-encoded polypeptide chain release factor. *The EMBO Journal*, **15**, 3127–3134.
- Payen, C., Koszul, R., Dujon, B., and Fischer, G. (2008) Segmental duplications arise from pol32-dependent repair of broken forks through two alternative replication-based mechanisms. *PLoS Genetics*, **4**, e1000175.
- Payen, C., Fischer, G., Marck, C. *et al.* (2009) Unusual composition of a yeast chromosome arm is associated with its delayed replication. *Genome Research*, **19**, 1710–1721.
- Payne, G.S. and Schekman, R. (1985) A test of clathrin function in protein secretion and cell growth. *Science*, **230**, 1009–1014.
- Payne, W.E., Kaiser, C.A., Bevis, B.J. *et al.* (2000) Isolation of *Pichia pastoris* genes involved in ER-to-Golgi transport. *Yeast (Chichester, England)*, **16**, 979–993.
- Peiró-Chova, L. and Estruch, F. (2009) The yeast RNA polymerase II-associated factor Iwr1p Is Involved in the basal and regulated transcription of specific genes. *The Journal of Biological Chemistry*, **284**, 28958–28967.
- Pelechano, V., Chavez, S., and Perez-Ortin, J.E. (2010) A complete set of nascent transcription rates for yeast genes. *PLoS One*, **5**, e15442.
- Pelham, H.R., Hardwick, K.G., and Lewis, M.J. (1988) Sorting of soluble ER proteins in yeast. *The EMBO Journal*, **7**, 1757–1762.
- Pelham, H.R. (1999a) SNAREs and the secretory pathway – lessons from yeast. *Experimental Cell Research*, **247**, 1–8.
- Pelham, H.R.B. (1999b) The Croonian Lecture 1999. Intracellular membrane traffic: getting proteins sorted. *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences*, **354**, 1471–1478.
- Pelham, H.R. (2001) SNAREs and the specificity of membrane fusion. *Trends in Cell Biology*, **11**, 99–101.
- Pelham, H.R. (2002) Insights from yeast endosomes. *Current Opinion in Cell Biology*, **14**, 454–462 (review).
- Pellman, D., Bagget, M., Tu, Y.H., Fink, G.R., and Tu, H. (1995) Two microtubule-associated proteins required for anaphase spindle movement in *Saccharomyces cerevisiae*. *The Journal of Cell Biology*, **130**, 1373–1385.
- Pena-Castillo, L. and Hughes, T.R. (2007) Why are there still over 1000 uncharacterized yeast genes? *Genetics*, **176**, 7–14.
- Peng, G. and Hopper, J.E. (2000) Evidence for Gal3p's cytoplasmic location and Gal80p's dual cytoplasmic–nuclear location implicates new mechanisms for controlling Gal4p activity in *Saccharomyces cerevisiae*. *Molecular and Cellular Biology*, **20**, 5140–5148.
- Peng, R., Grabowski, R., De Antoni, A., and Gallwitz, D. (1999) Specific interaction of the yeast *cis*-Golgi syntaxin Sed5p and the coat protein complex II component Sec24p of endoplasmic reticulum-derived transport vesicles. *Proceedings of the National Academy of Sciences of the United States of America*, **96**, 3751–3756.
- Penheiter, K.L., Washburn, T.M., Porter, S.E., Hoffman, M.G., and Jaehning, J.A. (2005) A posttranscriptional role for the yeast Paf1–RNA polymerase II complex is revealed by identification of primary targets. *Molecular Cell*, **20**, 213–223.
- Penswick, J., Martin, R., and Dirheimer, G. (1975) Evidence supporting a revised sequence for yeast alanine tRNA. *FEBS Letters*, **50**, 28–31.
- Percudani, R., Pavesi, A., and Ottonello, S. (1997) Transfer RNA gene redundancy and translational selection in *Saccharomyces cerevisiae*. *Journal of Molecular Biology*, **268**, 322–330.
- Pereira, G. and Schiebel, E. (2001) The role of the yeast spindle pole body and the mammalian centrosome in regulating late mitotic events. *Current Opinion in Cell Biology*, **13**, 762–769 (review).
- Pereira, G. and Schiebel, E. (2003) Separase regulates INCENP–Aurora B anaphase spindle function through Cdc14. *Science*, **302**, 2120–2124.
- Pereira, G., Höfken, T., Grindlay, J., Manson, C., and Schiebel, E. (2000) The Bub2p spindle checkpoint links nuclear migration with mitotic exit. *Molecular Cell*, **6**, 1–10.
- Perez-Martin, J. (1999) Chromatin and transcription in *Saccharomyces cerevisiae*. *FEMS Microbiology Reviews*, **23**, 503–523 (review).
- Perez-Ortin, J.E., Matallana, E., and Franco, L. (1989) Chromatin structure of yeast genes. *Yeast (Chichester, England)*, **5**, 219–238 (review).
- Perler, F.B. (2005) Inteins – a historical perspective, in *Homing Endonucleases and Inteins* (eds M.L. Belfort, B.L. Stoddard, D.W. Wood, and V. Derbyshire), Springer, Berlin, pp. 193–210.
- Perocchi, F., Mancera, E., and Steinmetz, L.M. (2008) Systematic screens for human disease genes, from yeast to human and back. *Molecular BioSystems*, **4**, 18–29.
- Perret, V., Florentz, C., Puglisi, J.D., and Giegé, R. (1992) Effect of conformational features on the aminoacylation of tRNAs and consequences on the permutation of tRNA specificities. *Journal of Molecular Biology*, **226**, 323–333.
- Perriman, R., Barta, I., Voeltz, G.K., Abelson, J., and Ares, M.Jr (2003) ATP requirement for Prp5p function is determined by Cus2p and the structure of U2 small nuclear RNA. *Proceedings of the National Academy of Sciences of the United States of America*, **100**, 13857–13862.
- Peters, J.M. (2002) The anaphase-promoting complex: proteolysis in mitosis and beyond. *Molecular Cell*, **9**, 931–943.
- Peters, R. (2006) Introduction to nucleocytoplasmic transport: molecules and mechanisms. *Methods in Molecular Biology (Clifton, NJ)*, **322**, 235–258.
- Peterson, C.L. and Tamkun, J.W. (1995) The SWI–SNF complex: a chromatin remodeling machine? *Trends in Biochemical Sciences*, **20**, 143–146 (review).
- Peterson, C.L. (2002) HDAC's at work: everyone doing their part. *Molecular Cell*, **9**, 921–929.
- Petes, T.D., Broach, J.R., Wensink, P.C., Hereford, L.M., Fink, G.R., and Botstein, D. (1978) Isolation and analysis of recombinant DNA molecules containing yeast DNA. *Genetics*, **4**, 37–49.
- Petrasccheck, M., Castagna, F., and Barberis, A. (2001) Two-hybrid selection assay to identify proteins interacting with polymerase II transcription factors and regulators. *Biotechniques*, **30**, 296–298, 300, 302.
- Pfander, B., Moldovan, G.L., Sacher, M., Hoegel, C., and Jentsch, S. (2005) SUMO-modified PCNA recruits Srs2 to prevent recombination during S phase. *Nature*, **436**, 428–433.
- Pfanner, N., Hartl, F.U., Guiard, B., and Neupert, W. (1987) Mitochondrial precursor proteins are imported through a hydrophilic membrane environment. *European Journal of Biochemistry*, **169**, 289–293.
- Phaff, H.J. (1963) Cell wall of yeast. *Annual Review of Microbiology*, **17**, 15–30 (review).
- Phan, L., Schoenfeld, L.W., Valásek, L., Nielsen, K.H., and Hinnebusch, A.G. (2001) A subcomplex of three eIF3 subunits binds eIF1 and eIF5 and stimulates ribosome binding of mRNA and tRNA_i^{Met}. *The EMBO Journal*, **20**, 2954–2965.
- Philip, B. and Levin, D.E. (2001) Wsc1 and Mid2 are cell surface sensors for cell wall integrity signaling that act through Rom2, a guanine nucleotide exchange factor for Rho1. *Molecular and Cellular Biology*, **21**, 271–280.
- Philippsen, P., Thomas, M., Kramer, R.A., and Davis, R.W. (1978) Unique arrangement of coding sequences for 5S, 5.8S, 18S and 25S ribosomal RNA in *Saccharomyces cerevisiae* as determined by R-loop and hybridization analysis. *Journal of Molecular Biology*, **123**, 387–404.
- Phizicky, E.M. and Alfonso, J.D. (2010) Do all modifications benefit all tRNAs? *FEBS Letters*, **584**, 265–271.
- Phizicky, E.M., Consaul, S.A., Nehrke, K.W., and Abelson, J. (1992) Yeast tRNA ligase mutants are nonviable and accumulate tRNA splicing intermediates. *The Journal of Biological Chemistry*, **267**, 4577–4582.
- Pichler, H. and Riezman, H. (2004) Where sterols are required for endocytosis. *Biochimica et Biophysica Acta*, **1666**, 51–61 (review).
- Pickart, C.M. and Cohen, R.E. (2004) Proteasomes and their kin: proteases in the machine age. *Nature Reviews Molecular Cell Biology*, **5**, 177–187 (review).
- Pickart, C.M. and Rose, I.A. (1985) Functional heterogeneity of ubiquitin carrier proteins. *The Journal of Biological Chemistry*, **260**, 1573–1581.
- Pickart, C.M. (2001) Mechanisms underlying ubiquitination. *Annual Review of Biochemistry*, **70**, 503.
- Piekarska, I., Rytka, J., and Rempola, B. (2010) Regulation of sporulation in the yeast *Saccharomyces cerevisiae*. *Acta Biochimica Polonica*, **57**, 241–250.
- Pierce, M. and Ballou, C.E. (1983) Cell–cell recognition in yeast – characterization of the sexual agglutination factors from *Saccharomyces kluyveri*. *The Journal of Biological Chemistry*, **258**, 3576–3582.
- Pietrokovski, S. (1994) Conserved sequence features of inteins (protein introns) and their use in identifying new inteins and related proteins. *Protein Science*, **3**, 2340–2350.
- Pijnappel, W.W., Schaft, D., Roguev, A. *et al.* (2001) The *S. cerevisiae* SET3 complex includes two histone deacetylases, Hos2 and Hst1, and is a meiotic-specific repressor of the sporulation gene program. *Genes and Development*, **15**, 2991–3004.
- Pillus, L. (2008) MYSTs mark chromatin for chromosomal functions. *Current Opinion in Cell Biology*, **20**, 326–333.

- Pilon, M., Schekman, R., and Römisch, K. (1997) Sec61p mediates export of misfolded secretory proteins from the endoplasmic reticulum to the cytosol for degradation. *The EMBO Journal*, **16**, 4540–4548.
- Pilon, M., Römisch, K., Quach, D., and Schekman, R. (1998) Sec61p serves multiple roles in secretory precursor binding and translocation into the endoplasmic reticulum membrane. *Molecular Biology of the Cell*, **9**, 3455–3473.
- Pineau, L. and Ferreira, T. (2010) Lipid-induced ER stress in yeast and β cells: parallel trails to a common fate. *FEMS Yeast Research*, **10**, 1035–1045.
- Pinkham, J.L. and Guarente, L. (1985) Cloning and molecular analysis of the HAP2 locus: a global regulator of respiratory genes in *Saccharomyces cerevisiae*. *Molecular and Cellular Biology*, **5**, 3410–3416.
- Pinto, I., Ware, D.E., and Hampsey, M. (1992) The yeast *SUA7* gene encodes a homolog of human transcription factor TFIIIB and is required for normal start site selection *in vivo*. *Cell*, **68**, 977–988.
- Piontek, M., Hagedorn, J., Hollenberg, C.P., Gellissen, G., and Strasser, A.W.M. (1998) Two novel gene expression systems based on the yeasts *Schwanniomyces occidentalis* and *Pichia stipitis*. *Applied Microbiology and Biotechnology*, **50**, 331–338.
- Piper, P.W., Ortiz-Calderon, C., Holyoak, C., Coote, P., and Cole, M. (1997) Hsp30, the integral plasma membrane heat shock protein of *Saccharomyces cerevisiae*, is a stress-inducible regulator of plasma membrane H⁺-ATPase. *Cell Stress & Chaperones*, **2**, 12–24.
- Piper, P.W. (1994) Measurement of transcription. in *Molecular Genetics of Yeast: A Practical Approach* (ed. J.R. Johnston), IRL Press, Oxford, pp. 135–146.
- Piper, P.W. (2006) Long-lived yeast as a model for ageing research. *Yeast (Chichester, England)*, **23**, 215–226.
- Pittet, M. and Conzelmann, A. (2007) Biosynthesis and function of GPI proteins in the yeast *Saccharomyces cerevisiae*. *Biochim. Biophys. Acta*, **1771**, 405–420.
- Pittet, M. and Conzelmann, A. (2007) Biosynthesis and function of GPI proteins in the yeast *Saccharomyces cerevisiae*. *Biochimica et Biophysica Acta*, **1771**, 405–420.
- Placek, J., Devgan, G., Michaud, G. *et al.* (2005) Global analysis of protein phosphorylation in yeast. *Nature*, **438**, 679–684.
- Platta, H.W. and Erdmann, R. (2007) The peroxisomal protein import machinery. *FEBS Letters*, **581**, 2811–2819.
- Platta, H.W., El Magraoui, F., Baumer, B.E., Schlee, D., Girzalsky, W., and Erdmann, R. (2009) Pex2 and Pex12 function as protein-ubiquitin ligases in peroxisomal protein import. *The Journal of Cell Biology*, **177**, 197–204.
- Pleiss, J.A., Whitworth, G.B., Bergkessel, M., and Guthrie, C. (2007) Transcript specificity in yeast pre-mRNA splicing revealed by mutations in core spliceosomal components. *PLoS Biology*, **5**, e90.
- Plemper, R.K., Böhmeler, S., Bordallo, J., Sommer, T., and Wolf, D.H. (1997) Mutant analysis links the translocon and BiP to retrograde protein transport for ER degradation. *Nature*, **388**, 891–895.
- Pnueli, L., Edry, I., Cohen, M., and Kassir, Y. (2004) Glucose and nitrogen regulate the switch from histone deacetylation to acetylation for expression of early meiosis-specific genes in budding yeast. *Molecular and Cellular Biology*, **24**, 5197–5208.
- Pokholok, D.K., Hannett, N.M., and Young, R.A. (2002) Exchange of RNA polymerase II initiation and elongation factors during gene expression *in vivo*. *Molecular Cell*, **9**, 799–809.
- Pollard, M.G., Travers, K.J., and Weissman, J.S. (1998) Ero1p: a novel and ubiquitous protein with an essential role in oxidative protein folding in the endoplasmic reticulum. *Molecular Cell*, **1**, 171–182.
- Pollock, R.A., Hartl, F.U., Cheng, M.Y., Ostermann, J., Horwich, A., and Neupert, W. (1988) The processing peptidase of yeast mitochondria: the two co-operating components MPP and PEP are structurally related. *The EMBO Journal*, **11**, 3493–3500.
- Pondugula, S., Neef, D.W., Voth, W.P. *et al.* (2009) Coupling phosphate homeostasis to cell cycle-specific transcription: mitotic activation of *Saccharomyces cerevisiae* *PHO5* by Mcm1 and Forkhead proteins. *Molecular and Cellular Biology*, **29**, 4891–4905.
- Poon, D. and Weil, P.A. (1993) Immunopurification of yeast TATA-binding protein and associated factors. Presence of transcription factor IIIB transcriptional activity. *The Journal of Biological Chemistry*, **268**, 15325–15328.
- Poon, D., Campbell, A.M., Bai, Y., and Weil, P.A. (1994) Yeast Taf170 is encoded by MOT1 and exists in a TATA box-binding protein (TBP)-TBP-associated factor complex distinct from transcription factor IID. *The Journal of Biological Chemistry*, **269**, 23135–23140.
- Poon, D., Bai, Y., Campbell, A.M. *et al.* (1995) Identification and characterization of a TFIID-like multiprotein complex from *Saccharomyces cerevisiae*. *Proceedings of the National Academy of Sciences of the United States of America*, **92**, 8224–8228.
- Porro, D., Gasser, B., Fossati, T. *et al.* (2011) Production of recombinant proteins and metabolites in yeasts: when are these systems better than bacterial production systems? *Applied Microbiology and Biotechnology*, **89**, 939–948 (review).
- Posas, F., Wurgler-Murphy, S.M., Maeda, T., Witten, E.A., Thai, T.C., and Saito, H. (1996) Yeast HOG1 MAP kinase cascade is regulated by a multistep phosphorelay mechanism in the SLN1-YPD1-SSK1 “two-component” osmosensor. *Cell*, **86**, 865–875.
- Poulter, R.T.M., Goodwin, T.J.D., and Butler, M.I. (2007) The nuclear-encoded inteins of fungi. *Fungal Genetics and Biology*, **44**, 153–179.
- Powell, D.W., Weaver, C.M., Jennings, J.L., McAfee, K.J., He, Y., Weil, P.A., and Link, A.J. (2004) Cluster analysis of mass spectrometry data reveals a novel component of SAGA. *Molecular and Cellular Biology*, **24**, 7249–7259.
- Powers, R.W.III, Kaeberlein, M., Caldwell, S.D., Kennedy, B.K., and Fields, S. (2006) Extension of chronological life span in yeast by decreased TOR pathway signaling. *Genes and Development*, **20**, 174–184.
- Prakash, S. and Prakash, L. (2000) Nucleotide excision repair in yeast. *Mutation Research*, **451**, 13–24.
- Prakash, R., Satory, D., Dray, E. *et al.* (2009) Yeast Mph1 helicase dissociates Rad51-made D-loops: implications for crossover control in mitotic recombination. *Genes and Development*, **23**, 67–79.
- Prasher, D.C., Eckenrode, V.K., Ward, W.W., Prendergast, F.G., and Cormier, M. (1992) Primary structure of the *Aequorea victoria* green-fluorescent protein. *Gene*, **111**, 229–233.
- Prather, D., Krogan, N.J., Emili, A., Greenblatt, J.F., and Winston, F. (2005) Identification and characterization of Elf1, a conserved transcription elongation factor in *Saccharomyces cerevisiae*. *Molecular and Cellular Biology*, **25**, 10122–10135.
- Preker, P.J., Ohnacker, M., Minvielle-Sebastia, L., and Keller, W. (1997) A multisubunit 3' end processing factor from yeast containing poly (A) polymerase and homologues of the subunits of mammalian cleavage and polyadenylation specificity factor. *The EMBO Journal*, **16**, 4727–4737.
- Prelich, G., Tan, C.K., Kostura, M. *et al.* (1987) Functional identity of proliferating cell nuclear antigen and a DNA polymerase-delta auxiliary protein. *Nature*, **326**, 517–520.
- Presser, A., Elowitz, M.B., Kellis, M., and Kishony, R. (2008) The evolutionary dynamics of the *Saccharomyces cerevisiae* protein interaction network after duplication. *Proceedings of the National Academy of Sciences of the United States of America*, **105**, 950–954.
- Priblyova, L., Straub, M.L., Sychrova, H., and de Montigny, J. (2007) Characterisation of *Zygosaccharomyces rouxii* centromeres and construction of first *Z. rouxii* centromeric vectors. *Chromosome Research*, **15**, 439–445.
- Pridham, T.G. and Raper, K.B. (1950) *Ashbya gossypii*, its significance in nature and in the laboratory. *Mycologia*, **42**, 603–623.
- Prillinger, H., Molnar, O., Eliskases-Lechner, F., and Lopandic, K. (1999) Phenotypic and genotypic identification of yeasts from cheese. *Antonie van Leeuwenhoek*, **75**, 267–283.
- Primig, M., Williams, R.M., Winzeler, E.A. *et al.* (2000) The core meiotic transcriptome in budding yeasts. *Nature Genetics*, **26**, 415–423.
- Pringle, J.R., Adams, A.E., Drubin, D.G., and Haarer, B.K. (1991) Immunofluorescence methods for yeast. *Methods in Enzymology*, **194**, 565–665.
- Prinz, S., Avila-Campillo, I., Aldridge, C. *et al.* (2004) Control of yeast filamentous-form growth by modules in an integrated molecular network. *Genome Research*, **14**, 380–390.
- Prochazka, E., Polakova, S., Piskur, J., and Sulo, P. (2010) Mitochondrial genome from the facultative anaerobe and petite-positive yeast *Dekkera bruxellensis* contains the NADH dehydrogenase subunit genes. *FEMS Yeast Research*, **10**, 545–557.
- Proft, M., Pascual-Ahuir, A., deNadal, E., Arino, J., Serrano, R., and Posas, F. (2001) Regulation of the Sko1 transcriptional repressor by the Hog1 MAP kinase in response to osmotic stress. *The EMBO Journal*, **20**, 1123–1133.
- Prohl, C., Pelzer, W., Diekert, K. *et al.* (2001) The yeast mitochondrial carrier Leu5p and its human homologue Graves' disease protein are required for accumulation of coenzyme A in the matrix. *Molecular and Cellular Biology*, **21**, 1089–1097.

- Prokisch, H., Scharfe, C., Camp, D.G. *et al.* (2004) Integrative analysis of the mitochondrial proteome in yeast. *PLoS Biology*, **2**, 795–804.
- Proudfoot, N.J. and O'Sullivan, J. (2002) Polyadenylation: a tail of two complexes. *Current Biology*, **12**, R855–R857.
- Proudfoot, N.J., Furger, A., and Dye, M.J. (2002) Integrating mRNA processing with transcription. *Cell*, **108**, 501–512.
- Proudfoot, N. (1991) Poly(A) signals. *Cell*, **64**, 671–674.
- Proudfoot, N.J. (2004) New perspectives on connecting messenger RNA 3' end formation to transcription. *Current Opinion in Cell Biology*, **16**, 272–278.
- Prunell, A. and Bernardi, G. (1974) The mitochondrial genome of wild-type yeast cells. IV. Genes and spacers. *Journal of Molecular Biology*, **86**, 825–841.
- Prusty, R., Grisafi, P., and Fink, G.R. (2004) The plant hormone indoleacetic acid induces invasive growth in *Saccharomyces cerevisiae*. *Proceedings of the National Academy of Sciences of the United States of America*, **101**, 4153–4157.
- Pruyne, D. and Bretscher, A. (2000) Polarization of cell growth in yeast. *Journal of Cell Science*, **113**, 571–585.
- Pryde, F.E. and Louis, E.J. (1997) *Saccharomyces cerevisiae* telomeres. A review. *Biochemistry*, **62**, 1232–1241.
- Pryer, N.K., Wuestehube, L.J., and Schekman, R. (1992) Vesicle-mediated protein sorting. *Annual Review of Biochemistry*, **61**, 471–516 (review).
- Ptashne, M. and Gann, A. (2003) Signal transduction. Imposing specificity on kinases. *Science*, **299**, 1025–1027.
- Ptashne, M. (1989) How gene activators work. *Scientific American*, **260**, 40–47 (review).
- Pugh, B.F. and Gilmour, D.S. (2001) Genome-wide analysis of protein DNA interactions in living cells. *Genome Biology*, **2**, 10–13 (review).
- Puig, O., Caspary, F., Rigaut, G. *et al.* (2001) The tandem affinity purification (TAP) method: a general procedure of protein complex purification. *Methods (San Diego, Calif.)*, **24**, 218–229.
- Pujari, V., Radebaugh, C.A., Chodaparambil, J.V. *et al.* (2010) The transcription factor spn1 regulates gene expression via a highly conserved novel structural motif. *Journal of Molecular Biology*, **404**, 1–15.
- Pujol, C., Daniels, K.J., Lockhart, S.R. *et al.* (2004) The closely related species *Candida albicans* and *Candida dubliniensis* can mate. *Eukaryotic Cell*, **3**, 1015–1027.
- Purdue, P.E. and Lazarow, P.B. (2001) Peroxisome biogenesis. *Annual Review of Cell and Developmental Biology*, **17**, 701–752 (review).
- Pye, V.E., Beuron, F., Keetch, C.A. *et al.* (2007) Structural insights into the p97–Ufd1–Npl4 complex. *Proceedings of the National Academy of Sciences of the United States of America*, **104**, 467–472.
- Qiu, X.B., Lin, Y.L., Thome, K.C. *et al.* (1998) An eukaryotic RuvB-like protein (RUVBL1) essential for growth. *The Journal of Biological Chemistry*, **273**, 27786–27793.
- Que, Q.Q. and Winzeler, E.A. (2002) Large-scale mutagenesis and functional genomics in yeast. *Functional & Integrative Genomics*, **2**, 193–198.
- Queralt, E. and Uhlmann, F. (2008a) Separase cooperates with Zds1 and Zds2 to activate Cdc14 phosphatase in early anaphase. *The Journal of Cell Biology*, **182**, 873–883.
- Queralt, E. and Uhlmann, F. (2008b) Cdk-counteracting phosphatases unlock mitotic exit. *Current Opinion in Cell Biology*, **20**, 661–668.
- Quigley, G.J., Seeman, N.C., Wang, A.J.H., Suddath, F.L., and Rich, A. (1975) Yeast phenylalanine transfer RNA: atomic coordinates and torsion angles. *Nucleic Acids Research*, **2**, 2329–2341.
- Raab, A.M. and Lang, C. (2011) Oxidative versus reductive succinic acid production in the yeast *Saccharomyces cerevisiae*. *Bioengineered Bugs*, **2**, 120–123.
- Rabitsch, K.P., Petronczki, M., Javerzat, J.P. *et al.* (2003) Kinetochores recruitment of two nucleolar proteins is required for homolog segregation in meiosis I. *Developmental Cell*, **4**, 535–548.
- Rader, S.D. and Guthrie, C. (2002) A conserved Lsm-interaction motif in Prp24 required for efficient U4/U6 di-snRNP formation. *RNA (New York, NY)*, **8**, 1378–1392.
- Raghuraman, M.K., Winzeler, E.A., Collingwood, D. *et al.* (2001) Replication dynamics of the yeast genome. *Science*, **294**, 115–121.
- Rainieri, S., Kodama, Y., Kaneko, Y. *et al.* (2006) Pure and mixed genetic lines of *Saccharomyces pastorianus* and their contribution to the lager brewing strain genome. *Applied and Environmental Microbiology*, **72**, 3968–3974.
- Rajbhandary, U.L., Stuart, A., Faulkner, R.D., Chang, S.H., and Khorana, H.G. (1966) Nucleotide sequence studies on yeast phenylalanine sRNA. *Cold Spring Harbor Symposia on Quantitative Biology*, **31**, 425–434.
- Rak, A., Fedorov, R., Alexandrov, K. *et al.* (2000) Crystal structure of the GAP domain of Gyp1p: first insights into interaction with Ypt/Rab proteins. *The EMBO Journal*, **19**, 5105–5113.
- Rak, M., Zeng, X., Brière, J.-J., and Tzagoloff, A. (2009) Assembly of F0 in *Saccharomyces cerevisiae*. *Biochimica et Biophysica Acta*, **1793**, 108–116 (review).
- Ramanathan, A. and Schreiber, S.L. (2007) Multilevel regulation of growth rate in yeast revealed using systems biology. *Journal of Biology*, **6**, 3.
- Ramezani-Rad, M., Hollenberg, C.P., Lauber, J. *et al.* (2003) The *Hansenula polymorpha* (strain CBS4732) genome sequencing and analysis. *FEMS Yeast Research*, **4**, 207–215.
- Ramirez-Zavaleta, C.Y., Salas-Delgado, G.E., De Las Penas, A., and Castano, I. (2010) Subtelomeric silencing of the MTL3 locus of *Candida glabrata* requires yKu70, yKu80, and Rfl1 proteins. *Eukaryotic Cell*, **9**, 1602–1611.
- Ramos, P.C., Hockendorff, J., Johnson, E.S., Varshavsky, A., and Dohmen, R.J. (1998) Ump1p is required for proper maturation of the 20S proteasome and becomes its substrate upon completion of the assembly. *Cell*, **92**, 489–499.
- Ranish, J.A. and Hahn, S. (1991) The yeast general transcription factor TFIIA is composed of two polypeptide subunits. *The Journal of Biological Chemistry*, **266**, 19320–19327.
- Rank, G.H. and Bech-Hansen, N.T. (1973) Single nuclear gene inherited cross resistance and collateral sensitivity to 17 inhibitors of mitochondrial function in *S. cerevisiae*. *General Genetics*, **126**, 93–102.
- Rao, H. and Sastry, A. (2002) Recognition of specific ubiquitin conjugates is important for the proteolytic functions of the UBA domain proteins Dsk2 and Rad23. *The Journal of Biological Chemistry*, **277**, 11691–11695.
- Rao, H. and Stillman, B. (1995) The origin recognition complex interacts with a bipartite DNA binding site within yeast replicators. *Proceedings of the National Academy of Sciences of the United States of America*, **92**, 2224–2228.
- Rao, H., Marahrens, Y., and Stillman, B. (1994) Functional conservation of multiple elements in yeast chromosomal replicators. *Molecular and Cellular Biology*, **14**, 7643–7651.
- Rao, H., Uhlmann, F., Nasmyth, K., and Varshavsky, A. (2001) Degradation of a cohesin subunit by the N-end rule pathway is essential for chromosome stability. *Nature*, **410**, 955–959.
- Rapaport, D., Kunkele, K.P., Dembowski, M. *et al.* (1998) Dynamics of the TOM complex of mitochondria during binding and translocation of preproteins. *Molecular and Cellular Biology*, **18**, 5256–5262.
- Rapoport, T.A., Jungnickel, B., and Kutay, U. (1996) Protein transport across the eukaryotic endoplasmic reticulum and bacterial inner membranes. *Annual Review of Biochemistry*, **65**, 271–303 (review).
- Ravid, T., Kreft, S.G., and Hochstrasser, M. (2006) Membrane and soluble substrates of the Doa10 ubiquitin ligase are degraded by distinct pathways. *The EMBO Journal*, **25**, 533–543.
- Rayapuram, N. and Subramani, S. (2006) The importomer – a peroxisomal membrane complex involved in protein translocation into the peroxisomal matrix. *Biochimica et Biophysica Acta*, **1763**, 1613–1619.
- Rechsteiner, M., Hoffman, L., and Dubiel, W. (1993) The multicatalytic and 26S proteases. *The Journal of Biological Chemistry*, **268**, 6065–6068 (review).
- Reebe, K., Mock, M., Merriman, E., and Schimmel, P. (2008) Distinct domains of tRNA synthetase recognize the same base pair. *Nature*, **451**, 90–93.
- Reed, S.H., You, Z., and Friedberg, E.C. (1998) The yeast RAD7 and RAD16 genes are required for postincision events during nucleotide excision repair. *In vitro and in vivo studies with rad7 and rad16 mutants and purification of a Rad7/Rad16-containing protein complex. The Journal of Biological Chemistry*, **273**, 29481–29488.
- Reed, S.H., Akiyama, M., Stillman, B., and Friedberg, E.C. (1999) Yeast autonomously replicating sequence binding factor is involved in nucleotide excision repair. *Genes and Development*, **13**, 3052–3058.
- Reed, R. (2003) Coupling transcription, splicing and mRNA export. *Current Opinion in Cell Biology*, **15**, 326–331.
- Reeder, R.H. and Roeder, R.G. (1972) Ribosomal RNA synthesis in isolated nuclei. *Journal of Molecular Biology*, **67**, 433–441.

- Reedy, J.L., Floyd, A.M., and Heitman, J. (2009) Mechanistic plasticity of sexual reproduction and meiosis in the *Candida* pathogenic species complex. *Current Biology*, **19**, 891–899.
- Reese, J.C., Apone, L., Walker, S.S., Griffin, L.A., and Green, M.R. (1994) Yeast TAF(II)s in a multisubunit complex required for activated transcription. *Nature*, **371**, 523–527.
- Regenberg, B., Grotkjaer, T., Winther, O. *et al.* (2006) Growth-rate regulated genes have profound impact on interpretation of transcriptome profiling in *Saccharomyces cerevisiae*. *Genome Biology*, **7**, R107.
- Reggiori, F. and Klionsky, D.J. (2002) Autophagy in the eukaryotic cell. *Eukaryotic Cell*, **1**, 11–21 (review).
- Reggiori, F. and Pelham, H.R. (2001) Sorting of proteins into multivesicular bodies: ubiquitin-dependent and -independent targeting. *The EMBO Journal*, **20**, 5176–5186.
- Reggiori, F. and Pelham, H.R. (2002) A transmembrane ubiquitin ligase required to sort membrane proteins into multivesicular bodies. *Nature Cell Biology*, **4**, 117–123.
- Reggiori, F., Tucker, K.A., Stromhaug, P.E., and Klionsky, D.J. (2004) The Atg1–Atg13 complex regulates Atg9 and Atg23 retrieval transport from the pre-autophagosomal structure. *Developmental Cell*, **6**, 79–90.
- Regnacq, M. and Boucherie, H. (1993) Isolation and sequence of HSP30, a yeast heat-shock gene coding for a hydrophobic membrane protein. *Current Genetics*, **23**, 435–442.
- Rehling, P., Model, K., Brandner, K. *et al.* (2003) Protein insertion into the mitochondria inner membrane by a twin-pore translocase. *Science*, **299**, 1747–1751.
- Rehman, M.A. and Yankulov, K. (2009) The dual role of autonomously replicating sequences as origins of replication and as silencers. *Current Genetics*, **55**, 357–363.
- Rehwinkel, J., Raes, J., and Izaurralde, E. (2006) Nonsense-mediated mRNA decay: target genes and functional diversification of effectors. *Trends in Biochemical Sciences*, **31**, 639–646.
- Reichert, A.S. and Neupert, W. (2004) Mitochondriomics or what makes us breathe. *Trends in Genetics*, **20**, 555–562 (review).
- Reid, B.J. and Hartwell, L.H. (1977) Regulation of mating in the cell cycle of *Saccharomyces cerevisiae*. *The Journal of Cell Biology*, **75**, 355–365.
- Reinders, J., Zahedi, R.P., Pfanner, N., Meisinger, C., and Sickmann, A. (2006) Toward the complete yeast mitochondrial proteome: multidimensional separation techniques for mitochondrial proteomics. *Journal of Proteome Research*, **5**, 1543–1554.
- Reinders, J., Wagner, K., Zahedi, R.P. *et al.* (2007) Profiling phosphoproteins of yeast mitochondria reveals a role of phosphorylation in assembly of the ATP synthase. *Molecular & Cellular Proteomics*, **6**, 1896–1906.
- Reinke, H. and Gatfield, D. (2006) Genome-wide oscillation of transcription in yeast. *Trends in Biochemical Sciences*, **31**, 189–191.
- Remus, D. and Diffley, J.F. (2009) Eukaryotic DNA replication control: lock and load, then fire. *Current Opinion in Cell Biology*, **21**, 771–777.
- Remus, D., Beuron, F., Tolun, G., Griffith, J.D., Morris, E.P., and Diffley, J.F. (2009) Concerted loading of Mcm2–7 double hexamers around DNA during DNA replication origin licensing. *Cell*, **139**, 719–730.
- Ren, B., Robert, F., Wyrick, J.J. *et al.* (2000) Genome-wide location and function of DNA binding proteins. *Science*, **290**, 2306–2309.
- Ren, J., Kee, Y., Huibregtse, J.M. and Piper R.C. (2007) Hse1, a component of the yeast Hrs-STAM ubiquitin-sorting complex, associates with ubiquitin peptidases and a ligase to control sorting efficiency into multivesicular bodies. *Molecular Biology of the Cell*, **18**, 324–335.
- Ren, J., Kee, Y., Huibregtse, J.M., and Piper, R.C. (2007) Hse1, a component of the yeast Hrs-STAM ubiquitin sorting complex, associates with ubiquitin peptidases and a ligase to control sorting efficiency into multivesicular bodies. *Molecular Biology of the Cell*, **18**, 324–335.
- Replansky, T., Koufopanou, V., Greig, D., and Bell, G. (2008) *Saccharomyces sensu stricto* as a model system for evolution and ecology. *Trends in Ecology & Evolution*, **23**, 494–501.
- Resende, C.G., Outeiro, T.F., Sands, L., Lindquist, S., and Tuite, M.F. (2003) Prion protein gene polymorphisms in *Saccharomyces cerevisiae*. *Molecular Microbiology*, **49**, 1005–1017.
- Resnick, M.A. (2005) Reduced replication: a call to ARMS. *Cell*, **120**, 569–570 (review).
- Reuter, M., Bell, G., and Greig, D. (2007) Increased outbreeding in yeast in response to dispersal by an insect vector. *Current Biology*, **17**, R81–R83.
- Rexach, M. and Blobel, G. (1995) Protein import into nuclei: association and dissociation reactions involving transport substrate, transport factors, and nucleoporins. *Cell*, **83**, 683–692.
- Rexach, M.F. and Schekman, R.W. (1991) Distinct biochemical requirements for the budding, targeting, and fusion of ER-derived transport vesicles. *The Journal of Cell Biology*, **114**, 219–229.
- Rexach, M.F., Latterich, M., and Schekman, R. W. (1994) Characteristics of endoplasmic reticulum-derived transport vesicles. *The Journal of Cell Biology*, **126**, 1133–1148.
- Reynard, G.J., Reynolds, W., Verma, R., and Deshaies, R.J. (2000) Cks1 is required for G₁ cyclin–cyclin-dependent kinase activity in budding yeast. *Molecular and Cellular Biology*, **20**, 5858–5864.
- Rhodin, J., Astromskas, E., and Cohn, M. (2006) Characterization of the DNA binding features of *Saccharomyces castellii* Cdc13p. *Journal of Molecular Biology*, **355**, 335–346.
- Ribar, B., Prakash, L., and Prakash, S. (2007) ELA1 and CUL3 are required along with ELC1 for RNA polymerase II polyubiquitylation and degradation in DNA-damaged yeast cells. *Molecular and Cellular Biology*, **27**, 3211–3216.
- Ricchetti, M., Fairhead, C., and Dujon, B. (1999) Mitochondrial DNA repairs double-strand breaks in yeast chromosomes. *Nature*, **402**, 96–100.
- Rice, J.C. and Allis, C.D. (2001) Histone methylation versus histone acetylation: new insights into epigenetic regulation. *Current Opinion in Cell Biology*, **13**, 263–273.
- Rich, A. and Kim, S.H. (1978) The three-dimensional structure of transfer RNA. *Scientific American*, **238**, 52–62.
- Richard, G.F. and Dujon, B. (1997) Trinucleotide repeats in yeast. *Research in Microbiology*, **148**, 731–744.
- Richard, G.F. and Dujon, B. (2006) Molecular evolution of minisatellites in hemiascomycetous yeasts. *Molecular Biology and Evolution*, **23**, 189–202.
- Richard, G.F., Hennequin, C., Thierry, A., and Dujon, B. (1999) Trinucleotide repeats and other microsatellites in yeasts. *Research in Microbiology*, **150**, 589–602 (review).
- Richly, H., Rape, M., Braun, S., Rumpf, S., Hoege, C., and Jentsch, S. (2005) A series of ubiquitin binding factors connects CDC48/p97 to substrate multiubiquitylation and proteasomal targeting. *Cell*, **120**, 73–84.
- Richter-Ruoff, B., Heinemeyer, W., and Wolf, D. H. (1992) The proteasome/multicatalytic-multifunctional proteinase. *In vivo* function in the ubiquitin-dependent N-end rule pathway of protein degradation in eukaryotes. *FEBS Letters*, **302**, 192–196.
- Rieger, K.J., Kaniak, A., Coppee, J.Y. *et al.* (1997) Large-scale phenotypic analysis – the pilot project on yeast chromosome III. *Yeast (Chichester, England)*, **13**, 1547–1562.
- Riezman, H., Munn, A., Geli, M.I., and Hicke, L. (1996) Actin-, myosin- and ubiquitin-dependent endocytosis. *Experientia*, **52**, 1033–1041 (review).
- Riezman, H. (1985) Endocytosis in yeast: several of the yeast secretory mutants are defective in endocytosis. *Cell*, **40**, 1001–1009.
- Riezman, H. (1993) Yeast endocytosis. *Trends in Cell Biology*, **3**, 273–277.
- Rigaut, G., Shevchenko, A., Rutz, B., Wilm, M., Mann, M., and Seraphin, B. (1999) A generic protein purification method for protein complex characterization and proteome exploration. *Nature Biotechnology*, **17**, 1030–1032.
- Rinaldi, T., Ricci, C., Porro, D., Bolotin-Fukuhara, M., and Frontali, L. (1998) A mutation in a novel yeast proteasomal gene, *RPN11/MPR1*, produces a cell cycle arrest, overreplication of nuclear and mitochondrial DNA, and an altered mitochondrial morphology. *Molecular Biology of the Cell*, **9**, 2917–2931.
- Rinaldi, T., Dallabona, C., Ferrero, I., Frontali, L., and Bolotin-Fukuhara, M. (2010) Mitochondrial diseases and the role of the yeast models. *FEMS Yeast Research*, **10**, 1006–1022 (review).
- Riva, M., Memet, S., Micouin, J.Y. *et al.* (1986) Isolation of structural genes for yeast RNA polymerases by immunological screening. *Proceedings of the National Academy of Sciences of the United States of America*, **83**, 1554–1558.
- Rivier, D.H. and Rine, J. (1992) An origin of DNA replication and a transcription silencer require a common element. *Science*, **256**, 659–663.
- Römisch, K. and Corsi, A. (1996) The zip code, in *Protein Targeting* (ed. S.M. Hurlley), Oxford University Press, Oxford, pp. 101–122.
- Römisch, K. and Schekman, R. (1992) Distinct processes mediate glycoprotein and glycopeptide export from the endoplasmic reticulum in *Saccharomyces cerevisiae*.

- Proceedings of the National Academy of Sciences of the United States of America*, **89**, 7227–7231.
- Römisch, K. (1999) Surfing the Sec61 channel: bidirectional protein translocation across the ER membrane. *Journal of Cell Science*, **112**, 4185–4191 (review).
- Römisch, K. (2006) Cdc48p is UBX-linked to ER ubiquitin ligases. *Trends in Biochemical Sciences*, **31**, 24–25 (review).
- Ro, D.K., Paradise, E.M., Ouellet, M. *et al.* (2006) Production of the antimalarial drug precursor artemisinic acid in engineered yeast. *Nature*, **440**, 940–943.
- Robert, F., Pokholok, D.K., Hannett, N.M. *et al.* (2004) Global position and recruitment of HATs and HDACs in the yeast genome. *Molecular Cell*, **16**, 199–209.
- Roberts, S.M. and Winston, F. (1997) Essential functional interactions of SAGA, a *Saccharomyces cerevisiae* complex of Spt, Ada, and Gcnr proteins, with the Snf/Swi and Srb/mediator complexes. *Genetics*, **147**, 451–465.
- Roberts, S.G.E., Ha, I., Maldonado, E., Reinberg, D., and Green, M.R. (1993) Interaction between acidic activator and transcription factor TFIIB is required for transcriptional activation. *Nature*, **363**, 741–744.
- Roberts, R.L., Mosch, H.U., and Fink, G.R. (1997) 14-3-3 proteins are essential for RAS/MAPK cascade signaling during pseudohyphal development in *S. cerevisiae*. *Cell*, **89**, 1055–1065.
- Roberts, C.J., Nelson, B., Marton, M.J. *et al.* (2000) Microarray-based approaches: gene functions and drug targets (INK-JET). *Science*, **287**, 873–880.
- Roberts, R.J. (1993) *An amazing distortion in DNA induced by a methyltransferase*. Nobel Lecture, http://nobelprize.org/nobel_prizes/medicine/laureates/1993/roberts-lecture.html.
- Robertson, L.S. and Fink, G.R. (1998) The three yeast A kinases have specific signaling functions in pseudohyphal growth. *Proceedings of the National Academy of Sciences of the United States of America*, **95**, 13783–13787.
- Robertson, L.S., Causton, H.C., Young, R.A., and Fink, G.R. (2000) The yeast A kinases differentially regulate iron uptake and respiratory function. *Proceedings of the National Academy of Sciences of the United States of America*, **97**, 5984–5988.
- Robinson, L.C., Hubbard, E.J.A., Graves, P.R. *et al.* (1992) Yeast casein kinase I homologues: an essential gene pair. *Proceedings of the National Academy of Sciences of the United States of America*, **89**, 28–32.
- Robinson, M., Poon, P.P., Schindler, C. *et al.* (2006) The Gcs1 Arf-GAP mediates Snc1,2 v-SNARE retrieval to the Golgi in yeast. *Molecular Biology of the Cell*, **17**, 1845–1858.
- Roby, D., Suka, Y., Xenarios, I. *et al.* (2002) Microarray deacetylation maps determine genome-wide functions for yeast histone deacetylases. *Cell*, **109**, 437–446.
- Robzyk, K., Recht, J., and Osley, M.A. (2000) Rad6-dependent ubiquitination of histone H2B in yeast. *Science*, **287**, 501–504.
- Rocak, S. and Linder, P. (2004) DEAD-box proteins: the driving forces behind RNA metabolism. *Nature Reviews Molecular Cell Biology*, **5**, 232–241.
- Rockmill, B. and Roeder, G.S. (1988) RED1: a yeast gene required for the segregation of chromosomes during the reductional division of meiosis. *Proceedings of the National Academy of Sciences of the United States of America*, **85**, 6057–6061.
- Rodríguez-Navarro, S., Fischer, T., Luo, M.J., Antúnez, O., Brettschneider, S., Lechner, J., Pérez-Ortín, J.E., Reed, R., and Hurt, E. (2004) Sus1, a functional component of the SAGA histone acetylase complex and the nuclear pore-associated mRNA export machinery. *Cell*, **116**, 75–86.
- Rodrigues, M.E., Costa, A.R., Henriques, M., Azeredo, J., and Oliveira, R. (2010) Technological progresses in monoclonal antibody production systems. *Biotechnology Progress*, **26**, 332–351 (review).
- Rodrigues-Pousada, C.A., Nevitt, T., Menezes, R., Azevedo, D., Pereira, J., and Amaral, C. (2004) Yeast activator proteins in stress response: an overview. *FEBS Letters*, **567**, 80–85.
- Rodríguez-Manzanique, M.T., Tamarit, J., Bellí, G., Ros, J., and Herrero, E. (2002) Grx5 is a mitochondrial glutaredoxin required for the activity of iron/sulfur enzymes. *Molecular Biology of the Cell*, **13**, 1109–11011.
- Rodríguez-Navarro, S. (2009) Insights into SAGA function during gene expression. *EMBO Reports*, **10**, 843–850.
- Roeder, G.S. and Fink, G.R. (1980) DNA rearrangements associated with a transposable element in yeast. *Cell*, **21**, 239–249.
- Roeder, G.S. and Fink, G.R. (1982) Movement of yeast transposable elements by gene conversion. *Proceedings of the National Academy of Sciences of the United States of America*, **79**, 5621–5625.
- Roeder, R.G. and Rutter, W.T. (1969) Multiple forms of DNA-dependent RNA polymerase in eukaryotic organisms. *Nature*, **224**, 234–237.
- Roeder, G.S., Farabaugh, P.J., Chaleff, D.T., and Fink, G.R. (1980) The origins of gene instability in yeast. *Science*, **209**, 1375–1380.
- Roemer, T., Vallier, L.G., and Snyder, M. (1996) Selection of polarized growth sites in yeast. *Trends in Cell Biology*, **6**, 434–441.
- Roetzer, A., Gabaldon, T., and Schuller, C. (2010a) From *Saccharomyces cerevisiae* to *Candida glabrata* in a few easy steps, important adaptations for an opportunistic pathogen. *FEMS Microbiology Letters*, **314**, 1–9.
- Roetzer, A., Gratz, N., Kovarik, P., and Schuller, C. (2010b) Autophagy supports *Candida glabrata* survival during phagocytosis. *Cellular Microbiology*, **12**, 199–216.
- Roetzer, A., Klopff, E., Gratz, N. *et al.* (2011) Regulation of *Candida glabrata* oxidative stress resistance is adapted to host environment. *FEBS Letters*, **585**, 319–327.
- Rogers, B., Decottignies, A., Kolaczowski, M., Carvajal, E., Balzi, E., and Goffeau, A. (2001) The pleiotropic drug ABC transporters from *Saccharomyces cerevisiae*. *Journal of Molecular Microbiology and Biotechnology*, **3**, 207–214 (review).
- Rogoza, T., Goginashvili, A., Rodionova, S. *et al.* (2010) Non-Mendelian determinant [ISP⁺] in yeast is a nuclear-residing prion form of the global transcriptional regulator Sfp1. *Proceedings of the National Academy of Sciences of the United States of America*, **107**, 10573–10577.
- Roh, D.-H., Bowers, B., Schmidt, M., and Cabib, E. (2002) The septation apparatus, an autonomous system in budding yeast. *Molecular Biology of the Cell*, **13**, 2747–2759.
- Rohde, J.R., Bastidas, R., Puria, R., and Cardenas, M.E. (2008) Nutritional control via Tor signaling in *Saccharomyces cerevisiae*. *Current Opinion in Microbiology*, **11**, 153–160.
- Rolland, T., Neuvéglise, C., Sacerdot, C., and Dujon, B. (2009) Insertion of horizontally transferred genes within conserved syntenic regions of yeast genomes. *PLoS One*, **4**, e6515.
- Rolland, T. and Dujon, B. (2011) Yeast clocks: dating genomic changes in yeasts. *Comptes Rendus Biologies*, **334**, 620–628.
- Rolland, F., Winderickx, J., and Thevelein, J.M. (2002) Glucose-sensing and -signalling mechanisms in yeast. *FEMS Yeast Research*, **2**, 183–201.
- Rolland, T., Dujon, B., and Richard, G.F. (2010) Dynamic evolution of megasatellites in yeasts. *Nucleic Acids Research*, **38**, 4731–4739.
- Roman, H. (1981) Development of yeast as an experimental organism, in *The Molecular and Cellular Biology of the Yeast Saccharomyces* (eds J.N. Strathern, E.W. Jones, and J.R. Broach), Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, pp. 1–9.
- Romanova, N.V. and Chernoff, V.O. (2009) Hsp104 and prion propagation. *Protein and Peptide Letters*, **16**, 598–605.
- Rondon, A.G., García-Rubio, M., González-Barrera, S., and Aguilera, A. (2003) Molecular evidence for a positive role of Spt4 in transcription elongation. *The EMBO Journal*, **22**, 612–620.
- Rose, M.D. and Broach, J.R. (1991) Cloning genes by complementation in yeast. *Methods in Enzymology*, **194**, 195–230.
- Rose, I.A. (1988) Ubiquitin carboxyl-terminal hydrolases, in *Ubiquitin* (ed. M. Rechsteiner), Plenum Press, New York, pp. 135–155.
- Rose, I.A. (2005) Ubiquitin at Fox Chase. Nobel Lecture. *Proceedings of the National Academy of Sciences of the United States of America*, **102**, 11575–11577, http://nobelprize.org/nobel_prizes/chemistry/laureates/2004/rose-lecture.html.
- Rosel, H. and Kunze, G. (1998) Integrative transformation of the dimorphic yeast *arxula adenivorans* LS3 based on hygromycin B resistance. *Current Genetics*, **33**, 157–163.
- Rosenblum, J.S., Pemberton, L.F., and Blobel, G. (1997) A nuclear import pathway for a protein involved in tRNA maturation. *The Journal of Cell Biology*, **139**, 1655–1661.
- Rosenblum, J.S., Pemberton, L.F., Bonifaci, N., and Blobel, G. (1998) Nuclear import and the evolution of a multifunctional RNA-binding protein. *The Journal of Cell Biology*, **143**, 887–899.
- Rosperts, S., Glick, B.S., Jenö, P. *et al.* (1993) Identification and functional analysis of chaperonin 10, the groES homolog from yeast mitochondria. *Proceedings of the National Academy of Sciences of the United States of America*, **90**, 10967–10971.
- Ross, E.D. and Wickner, R.B. (2004) Prions of yeast fail to elicit a transcriptional response. *Yeast (Chichester, England)*, **21**, 963–972.
- Ross, P.L., Huang, Y.N., Marchese, J.N. *et al.* (2004) Multiplexed protein quantitation in *Saccharomyces cerevisiae* using amine-reactive

- isobaric tagging reagents. *Molecular & Cellular Proteomics*, **3**, 1154–1169.
- Rossanese, O.W., Soderholm, J., Bevis, B.J. *et al.* (1999) Golgi structure correlates with transitional endoplasmic reticulum organization in *Pichia pastoris* and *Saccharomyces cerevisiae*. *The Journal of Cell Biology*, **145**, 69–81.
- Ross-Macdonald, P., Coelho, P.S., Roemer, T. *et al.* (1999a) Large-scale analysis of the yeast genome by transposon tagging and gene disruption. *Nature*, **402**, 413–418.
- Ross-Macdonald, P., Sheehan, A., Friddle, C., Roeder, G.S., and Snyder, M. (1999b) Transposon mutagenesis for the analysis of protein production, function, and localization. *Methods in Enzymology*, **302**, 512–532.
- Roth, S., Kummle, J., and Schüller, H.J. (2004) Transcriptional activators Cat8 and Sip4 discriminate between sequence variants of the carbon source-responsive promoter element in the yeast *Saccharomyces cerevisiae*. *Current Genetics*, **45**, 121–128.
- Roth, S.Y. (1995) Chromatin-mediated transcriptional repression in yeast. *Current Opinion in Genetics & Development*, **5**, 168–173 (review).
- Rothblatt, J.A., Deshaies, R.J., Sanders, S.L., Daum, G., and Schekman, R. (1989) Multiple genes are required for proper insertion of secretory proteins into the endoplasmic reticulum in yeast. *The Journal of Cell Biology*, **109**, 2641–2652.
- Rothman, J.E. and Orci, L. (1992) Molecular dissection of the secretory pathway. *Nature*, **355**, 409–415 (review).
- Rothman, J.H., Yamashiro, C.T., Kane, P.M., and Stevens, T.H. (1989) Protein targeting to the yeast vacuole. *Trends in Biochemical Sciences*, **14**, 347–350 (review).
- Rothstein, R.J. (1983) One-step gene disruption in yeast. *Methods in Enzymology*, **101**, 202–211.
- Rotin, D., Staub, O., and Haguenuer-Tsapis, R. (2000) Ubiquitination and endocytosis of plasma membrane proteins: role of Nedd4/Rsp5p family of ubiquitin–protein ligases. *The Journal of Membrane Biology*, **176**, 1–17 (review).
- Rottensteiner, H., Kal, A.J., Filipits, M. *et al.* (1996) Pip2p: a transcriptional regulator of peroxisome proliferation in the yeast *Saccharomyces cerevisiae*. *The EMBO Journal*, **15**, 2924–2934.
- Rottensteiner, H., Wabnegger, L., Erdmann, R. *et al.* (2003) *Saccharomyces cerevisiae* PIP2 mediating oleic acid induction and peroxisome proliferation is regulated by Adr1p and Pip2p–Oaf1p. *The Journal of Biological Chemistry*, **278**, 27605–27611.
- Rouhier, N., Couturier, J., Johnson, M.K., and Jacquot, J.-P. (2010) Glutaredoxins: roles in iron homeostasis. *Trends in Biochemical Sciences*, **35**, 43.
- Rouillon, A., Barbey, R., Patton, E.E., Tyers, M., and Thomas, D. (2000) Feedback-regulated degradation of the transcriptional activator Met4 is triggered by the SCF^{Met30} complex. *The EMBO Journal*, **19**, 282–294.
- Rout, M.P. and Blobel, G. (1993) Isolation of the yeast nuclear pore complex. *The Journal of Cell Biology*, **123**, 771–783.
- Rout, M.P. and Kilmartin, J.V. (1994) Preparation of yeast spindle pole bodies, in *Cell Biology: A Laboratory Handbook* (ed. J.E. Celis), Academic Press, New York, pp. 605–612.
- Rout, M.P., Blobel, G., and Aitchison, J.D. (1996) A distinct nuclear import pathway used by ribosomal proteins. *Cell*, **89**, 715–725.
- Rout, M.P., Aitchison, J.D., Suprpto, A., Hjertaas, K., Zhao, Y., and Chait, B.T. (2000) The yeast nuclear pore complex. Composition, architecture, and transport mechanism. *The Journal of Cell Biology*, **148**, 635–652.
- Rowland, B.D., Roig, M.B., Nishino, T. *et al.* (2009) Building sister chromatid cohesion: smc3 acetylation counteracts an antiestablishment activity. *Molecular Cell*, **33**, 763–774.
- Roy, S.W. and Gilbert, W. (2006) The evolution of spliceosomal introns, patterns, puzzles and progress. *Nature Reviews Genetics*, **7**, 211–221.
- Roy, B. and Sanyal, K. (2011) Diversity in requirement of genetic and epigenetic factors for centromere function in fungi. *Eukaryotic Cell*, **10**, 1384–1395.
- Royce, T.E., Rozowsky, J.S., Bertone, P. *et al.* (2005) Issues in the analysis of oligonucleotide tiling microarrays for transcript mapping. *Trends in Genetics*, **21**, 466–475.
- Rozpedowska, E., Galafassi, S., Johansson, L., Hagman, A., Piskur, J., and Compagno, C. (2011) *Candida albicans* – a pre-whole genome duplication yeast – is predominantly aerobic and a poor ethanol producer. *FEMS Yeast Research*, **11**, 285–291.
- Rubin, G.M., Finnegan, D.J., and Hogness, D.S. (1976) The chromosomal arrangement of coding sequences in a family of repeated genes. *Progress in Nucleic Acid Research and Molecular Biology*, **19**, 221–26.
- Rubin, D.M., Coux, O., Wefes, I. *et al.* (1996) Identification of the *gal4* suppressor Sug1 as a subunit of the yeast 26S proteasome. *Nature*, **379**, 655–657.
- Rubin, G.M. (1973) The nucleotide sequence of *Saccharomyces cerevisiae* 5.8S ribosomal ribonucleic acid. *The Journal of Biological Chemistry*, **248**, 3860–3875.
- Rubinsztein, D.C. (2006) The roles of intracellular protein degradation pathways in neurodegeneration. *Nature*, **443**, 780–786.
- Rubtsov, P.M., Musakhanov, M.M., Zakharyev, V.M., Krayev, A.S., Skryabin, K.G., and Bayev, A.A. (1980) The structure of the yeast ribosomal RNA genes. I. The complete nucleotide sequence of the 18S ribosomal RNA gene from *Saccharomyces cerevisiae*. *Nucleic Acids Research*, **8**, 5779–5794.
- Ruby, S.W. and Abelson, J. (1988) An early hierarchic role of U1 small nuclear ribonucleoprotein in spliceosome assembly. *Trends in Genetics*, **7**, 79–85.
- Ruchaud, S., Carmena, M., and Earnshaw, W.C. (2007) Chromosomal passengers: conducting cell division. *Nature Reviews Molecular Cell Biology*, **8**, 798–812.
- Ruden, D.M., Ma, J., and Ptashne, M. (1988) No strict alignment is required between a transcriptional activator binding site and the “TATA box” of a yeast gene. *Proceedings of the National Academy of Sciences of the United States of America*, **85**, 4262–4266.
- Ruderfer, D.M., Pratt, S.C., Seidel, H.S., and Kruglyak, L. (2006) Population genomic analysis of outcrossing and recombination in yeast. *Nature Genetics*, **38**, 1077–1081.
- Rue, S.M., Mattei, S., Saksena, S., and Emr, S.D. (2008) Novel Ist1–Did2 complex functions at a late step in multivesicular body sorting. *Molecular Biology of the Cell*, **19**, 475–484.
- Ruet, A., Camier, S., Smagowicz, W., Sentenac, A., and Fromageot, P. (1984) Isolation of a class C transcription factor which forms a stable complex with tRNA genes. *The EMBO Journal*, **3**, 343–350.
- Ruis, H. and Hamilton, B. (eds) (1992) *Regulation of Yeast Catalase Genes*, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY.
- Ruis, H. and Schuller, C. (1995) Stress signaling in yeast. *Bioessays*, **17**, 959–965 (review).
- Ruis, H. and Schuller, C. (1995) Stress signaling in yeast. *Bioessays*, **17**, 959–965 (review).
- Runge, K.W. and Zakian, V.A. (1996) TEL2, an essential gene required for telomere length regulation and telomere position effect in *Saccharomyces cerevisiae*. *Molecular and Cellular Biology*, **16**, 3094–3105.
- Runquist, D., Hahn-Hagerdal, B., and Radstrom, P. (2010) Comparison of heterologous xylose transporters in recombinant *Saccharomyces cerevisiae*. *Biotechnology for Biofuels*, **3**, 5.
- Russell, D.W., Jensen, R., Zoller, M.J. *et al.* (1986) Structure of the *Saccharomyces cerevisiae* HO gene and analysis of its upstream regulatory region. *Molecular and Cellular Biology*, **6**, 4281–4294.
- Russell, S.J., Steger, K.A., and Johnston, S.A. (1999) Subcellular localization, stoichiometry, and protein levels of 26 S proteasome subunits in yeast. *The Journal of Biological Chemistry*, **274**, 21943–21952.
- Russo, P., Simonen, M., Uimari, A., Teesalu, T., and Makarow, M. (1993) Dual regulation by heat and nutrient stress of the yeast HSP150 gene encoding a secretory glycoprotein. *Molecular & General Genetics*, **239**, 273–280.
- Rutherford, J.C., Jaron, S., Ray, E., Brown, P.O., and Winge, D.R. (2001) A second iron-regulatory system in yeast independent of Aft1p. *Proceedings of the National Academy of Sciences of the United States of America*, **98**, 14322–14327.
- Ryan, K.J. and Wente, S.R. (2000) The nuclear pore complex: a protein machine bridging the nucleus and cytoplasm. *Current Opinion in Cell Biology*, **12**, 361–371 (review).
- Ryan, K.J., McCaffery, J.M., and Wente, S.R. (2003) The Ran GTPase cycle is required for yeast nuclear pore complex assembly. *The Journal of Cell Biology*, **160**, 1041–1053.
- Ryan, K.J., Zhou, Y., and Wente, S.R. (2007) The karyopherin Kap95 regulates nuclear pore complex assembly into intact nuclear envelopes *in vivo*. *Molecular Biology of the Cell*, **18**, 886–898.
- Rybakin, V. and Clemen, C.S. (2005) Coronin proteins as multifunctional regulators of the cytoskeleton and membrane trafficking. *Bioessays*, **27**, 625–632.
- Sabourin, M. and Zakian, V.A. (2008) ATM-like kinases and regulation of telomerase: lessons from yeast and mammals. *Trends in Cell Biology*, **18**, 337–346 (review).
- Sacerdot, C., Casarégola, S., Lafontaine, I. *et al.* (2008) Promiscuous DNA in the nuclear

- genomes of hemiascomycetous yeasts. *FEMS Yeast Research*, **8**, 846–857.
- Sacher, M., Kim, Y.G., Lavie, A., Oh, B.H., and Segev, N. (2008) The TRAPP complex: insights into its architecture and function. *Traffic (Copenhagen, Denmark)*, **9**, 2032–2042.
- Sadowski, I., Niedbala, D., Wood, K., and Ptashne, M. (1991) GAL4 is phosphorylated as a consequence of transcriptional activation. *Proceedings of the National Academy of Sciences of the United States of America*, **88**, 10510–10514.
- Saerens, S.M., Verbelen, P.J., Vanbeneden, N., Thevelein, J.M., and Delvaux, F.R. (2008) Monitoring the influence of high-gravity brewing and fermentation temperature on flavour formation by analysis of gene expression levels in brewing yeast. *Applied Microbiology and Biotechnology*, **80**, 1039–1051.
- Saerens, S.M., Duong, C.T., and Nevoigt, E. (2010) Genetic improvement of brewer's yeast: current state, perspectives and limits. *Applied Microbiology and Biotechnology*, **86**, 1195–1212 (review).
- Sakchaisri, K., Asano, S., Yu, L.R. *et al.* (2004) Coupling morphogenesis to mitotic entry. *Proceedings of the National Academy of Sciences of the United States of America*, **101**, 4124–4129.
- Salama, N.R. and Schekman, R.W. (1995) The role of coat proteins in the biosynthesis of secretory proteins. *Current Opinion in Cell Biology*, **7**, 536–543 (review).
- Salama, N.R., Chuang, J.S., and Schekman, R.W. (1997) Sec31 encodes an essential component of the COPII coat required for transport vesicle budding from the endoplasmic reticulum. *Molecular Biology of the Cell*, **8**, 205–217.
- Salin, H., Fardeau, V., Piccini, E. *et al.* (2008) Structure and properties of transcriptional networks driving selenite stress response in yeasts. *BMC Genomics*, **9**, 333.
- Saltzgaber-Muller, J. and Schatz, G. (1978) Heme is necessary for the accumulation and assembly of cytochrome *c* oxidase subunits in *Saccharomyces cerevisiae*. *The Journal of Biological Chemistry*, **253**, 305–310.
- Salvadó, Z., Arroyo-López, F.N., Guillamon, J.M., Salazar, G., Querol, A., and Barrio, E. (2011) Temperature adaptation markedly determines evolution within the genus *Saccharomyces*. *Applied and Environmental Microbiology*, **77**, 2292–2302.
- Sampaio, J.P. and Gonçalves, P. (2008) Natural populations of *Saccharomyces kudriavzevii* in Portugal are associated with oak bark and are sympatric with *S. cerevisiae* and *S. paradoxus*. *Applied Environmental Microbiology*, **74**, 2144–2152.
- Samsonova, I.A., Kunze, G., Bode, R., and Bottcher, F. (1996) A set of genetic markers for the chromosomes of the imperfect yeast *Arxula adenivorans*. *Yeast (Chichester, England)*, **12**, 1209–1217.
- Sanchez, Y. and Lindquist, S.L. (1990) HSP104 required for induced thermotolerance. *Science*, **248**, 1112–1115.
- Sanchez, N.S., Arreguin, R., Calahorra, M., and Pena, A. (2008) Effects of salts on aerobic metabolism of *Debaryomyces hansenii*. *FEMS Yeast Research*, **8**, 1303–1312.
- Sandager, L., Dahlqvist, A., Banas, A. *et al.* (2000) An acylCoA: cholesterol acyltransferase (ACAT) related gene is involved in the accumulation of triacylglycerols in *Saccharomyces cerevisiae*. *Biochemical Society Transactions*, **28**, 700–702.
- Sanders, S.L. and Herskowitz, I. (1996) The BUD4 protein of yeast, required for axial budding, is localized to the mother/BUD neck in a cell cycle-dependent manner. *The Journal of Cell Biology*, **134**, 413–427.
- Sanders, S. L., Jennings, J., Canutescu, A., Link, A.J., and Weil, P.A. (2002) Proteomics of the eukaryotic transcription machinery: identification of proteins associated with components of yeast TFIID by multidimensional mass spectrometry. *Molecular and Cellular Biology*, 2002 Jul; **22**(13): 4723–38.
- Sandmeyer, S.B. and Clemens, K.A. (2010) Function of a retrotransposon nucleocapsid protein. *RNA Biology*, **7**, 642–654.
- Sandmeyer, S.B. and Olson, M.V. (1982) Insertion of a repetitive element at the same position in the 5'-flanking regions of two dissimilar yeast tRNA genes. *Proceedings of the National Academy of Sciences of the United States of America*, **79**, 7674–7678.
- Sandmeyer, S.B. (2003) Integration by design. *Proceedings of the National Academy of Sciences of the United States of America*, **100**, 5586–5588.
- Sanger, F., Nicklen, S., and Coulson, A.R. (1977) DNA sequencing with chain terminating inhibitors. *Proceedings of the National Academy of Sciences of the United States of America*, **74**, 5463–5467.
- Sanger, F. (2001) The early days of DNA sequences. *Nature Medicine*, **7**, 267–268.
- San-Segundo, P.A. and Roeder, G.S. (1999) Pch2 links chromatin silencing to meiotic checkpoint control. *Cell*, **97**, 313–324.
- Santamaria, P.G., Finley, D., Ballesta, J.P., and Remacha, M. (2003) Rpn6p, a proteasome subunit from *Saccharomyces cerevisiae*, is essential for the assembly and activity of the 26S proteasome. *The Journal of Biological Chemistry*, **278**, 6687–6695.
- Santangelo, G.M. (2006) Glucose signaling in *Saccharomyces cerevisiae*. *Microbiology and Molecular Biology Reviews*, **70**, 253–282.
- Santos, A., Marquina, D., Barroso, J., and Peinado, J.M. (2002) (1 → 6)-Beta-D-glucan as the cell wall binding site for *Debaryomyces hansenii* killer toxin. *Letters in Applied Microbiology*, **34**, 95–99.
- Santos, M.A., Gomes, A.C., Santos, M.C., Carreto, L.C., and Moura, G.R. (2011) The genetic code of the fungal CTG clade. *Comptes Rendus Biologies*, **334**, 607–611.
- Santos-Rosa, H., Moreno, H., Simos, G. *et al.* (1998) Nuclear mRNA export requires complex formation between Mex67p and Mtr2p at the nuclear pores. *Molecular and Cellular Biology*, **18**, 6826–6838.
- Sanyal, K., Baum, M., and Carbon, J. (2004) Centromeric DNA sequences in the pathogenic yeast *Candida albicans* are all different and unique. *Proceedings of the National Academy of Sciences of the United States of America*, **101**, 11374–11379.
- Sanz, P., Alms, G.R., Haystead, T.A., and Carlson, M. (2000) Regulatory interactions between the Reg1–Glc7 protein phosphatase and the Snf1 protein kinase. *Molecular and Cellular Biology*, **20**, 1321–1328.
- Sarkar, S., Azad, A.K., and Hopper, A.K. (1999) Nuclear tRNA aminoacylation and its role in nuclear export of endogenous tRNAs in *Saccharomyces cerevisiae*. *Proceedings of the National Academy of Sciences of the United States of America*, **96**, 14366–14371.
- Sato, K. and Nakano, A. (2007) Mechanisms of COPII vesicle formation and protein sorting. *FEBS Lett.*, **581**, 2076–2082.
- Sato, K. and Nakano, A. (2007) Mechanisms of COPII vesicle formation and protein sorting. *FEBS Letters*, **581**, 2076–2082.
- Sato, Y., Sakurai, A., Takahashi, N. *et al.* (1981) Amino acid sequence of alpha-K substance, a mating pheromone of *Saccharomyces kluyveri*. *Agricultural and Biological Chemistry*, **45**, 1531–1533.
- Sato, K., Noda, Y., and Yoda, K. (2009) Kei1: a novel subunit of inositolphosphorylceramide synthase, essential for its enzyme activity and Golgi localization. *Molecular Biology of the Cell*, **20**, 4444–4457.
- Sauer, M., Mattanovich, D., Porro, D., and Branduardi, P. (2008) Microbial production of organic acids: expanding the markets. *Trends in Biotechnology*, **26**, 100–108.
- Sauer, M., Porro, D., Mattanovich, D., and Branduardi, P. (2010) 16 years research on lactic acid production with yeast – ready for the market? *Biotechnology & Genetic Engineering Reviews*, **27**, 229–256 (review).
- Sauve, A.A., Wolberger, C., Schramm, V.L., and Boeke, J.D. (2006) The biochemistry of sirtuins. *Annual Review of Biochemistry*, **75**, 435–465.
- Saveanu, C., Bienvenu, D., Namane, A. *et al.* (2001) Nog2p, a putative GTPase associated with pre-60S subunits and required for late 60S maturation steps. *The EMBO Journal*, **20**, 6475–6484.
- Sawa, H. and Abelson, J. (1992) Evidence for a base-pairing interaction between U6 small nuclear RNA and 5' splice site during the splicing reaction in yeast. *Proceedings of the National Academy of Sciences of the United States of America*, **89**, 11269–11273.
- Sawadogo, M. and Roeder, R.G. (1985) Factors involved in specific transcription by human RNA polymerase II: analysis by a rapid and quantitative *in vitro* assay. *Proceedings of the National Academy of Sciences of the United States of America*, **82**, 4394–4398.
- Sawadogo, M. and Sentenac, A. (1990) RNA polymerase B (II) and general transcription factors. *Annual Review of Biochemistry*, **59**, 711–754 (review).
- Sawadogo, M., Sentenac, A., and Fromageot, P. (1980) Interaction of a new polypeptide with yeast RNA polymerase B. *The Journal of Biological Chemistry*, **255**, 12–15.
- Scannell, D.R. and Wolfe, K.H. (2008) A burst of protein sequence evolution and a prolonged period of asymmetric evolution follow gene duplication in yeast. *Genome Research*, **18**, 137–147.
- Scannell, D.R., Byrne, K.P., Gordon, J.L. *et al.* (2006) Multiple rounds of speciation associated with reciprocal gene loss in polyploid yeasts. *Nature*, **440**, 341–345.
- Scannell, D.R., Frank, A.C., Conant, G.C. *et al.* (2007) Independent sorting-out of thousands of duplicated gene pairs in two yeast species descended from a whole-genome duplication. *Proceedings of the National Academy of*

- Sciences of the United States of America*, **104**, 8397–8402.
- Scarcelli, J.J., Hodge, C.A., and Cole, C.N. (2007) The yeast integral membrane protein Apq12 potentially links membrane dynamics to assembly of nuclear pore complexes. *The Journal of Cell Biology*, **178**, 799–812.
- Schacherer, J., Tourette, Y., Souciet, J.-L., Potier, S., and De Montigny, J. (2004) Recovery of a function involving gene duplication by retroposition in *Saccharomyces cerevisiae*. *Genome Research*, **14**, 1291–1297.
- Schacherer, J., de Montigny, J., Welcker, A., Souciet, J.L., and Potier, S. (2005) Duplication processes in *Saccharomyces cerevisiae* haploid strains. *Nucleic Acids Research*, **33**, 6319–6326.
- Schacherer, J., Ruderfer, D.M., Gresham, D., Dolinski, K., Botstein, D., and Kruglyak, L. (2007) Genome-wide analysis of nucleotide-level variation in commonly used *Saccharomyces cerevisiae* strains. *PLoS One*, **2** (3), e322.
- Schacherer, J., Tourrette, Y., Potier, S., Souciet, J. L., de Montigny, J. (2007) Spontaneous duplications in diploid *Saccharomyces cerevisiae* cells. *DNA Repair (Amst)*, **6**, 1441–1452.
- Schacherer, J., Ruderfer, D.M., Gresham, D., Dolinski, K., Botstein, D., and Kruglyak, L. (2007a) Genome-wide analysis of nucleotide-level variation in commonly used *Saccharomyces cerevisiae* strains. *PLoS One*, **2**, e322.
- Schacherer, J., Tourrette, Y., Potier, S., Souciet, J. L., and de Montigny, J. (2007b) Spontaneous duplications in diploid *Saccharomyces cerevisiae* cells. *DNA Repair*, **6**, 1441–1452.
- Schacherer, J., Shapiro, J.A., Ruderfer, D.M., and Kruglyak, L. (2009) Comprehensive polymorphism survey elucidates population structure of *Saccharomyces cerevisiae*. *Nature*, **458**, 342–346.
- Schaeffer, L., Roy, R., Humbert, S. *et al.* (1993) DNA repair helicase: a component of BTF2 (TFIIH) basic transcription factor. *Science*, **260**, 58–63.
- Schaeffer, D., Tsanova, B., Barbas, A. *et al.* (2009) The exosome contains domains with specific endoribonuclease, exoribonuclease and cytoplasmic mRNA decay activities. *Nature Structural & Molecular Biology*, **16**, 56–62.
- Schaffar, G., Breuer, P., Boteva, R. *et al.* (2004) Cellular toxicity of polyglutamine expansion proteins: mechanism of transcription factor deactivation. *Molecular Cell*, **15**, 95–105.
- Scharfe, C., Zaccaria, P., Hoernagel, K. *et al.* (2000) MITOP, the mitochondrial proteome database: 2000 update. *Nucleic Acids Research*, **28**, 155–158.
- Schatz, G. and Butow, R.A. (1983) How are proteins imported into mitochondria? *Cell*, **32**, 316–318 (review).
- Schatz, G. and Dobberstein, B. (1996) Common principles of protein translocation across membranes. *Science*, **271**, 1519–1526 (review).
- Schatz, P.J., Pillus, L., Grisafi, P., Solomon, F., and Botstein, D. (1986) Two functional alpha-tubulin genes of the yeast *Saccharomyces cerevisiae* encode divergent proteins. *Molecular and Cellular Biology*, **6**, 3711–3721.
- Schatz, G. (1963) The isolation of possible mitochondrial precursor structures from aerobically grown baker's yeast. *Biochemical and Biophysical Research Communications*, **12**, 448–451.
- Schatz, G. (1967) Mitochondrial oxidative phosphorylation. *Angewandte Chemie (International Edition in English)*, **6**, 1035–1046 (review).
- Schatz, G. (1970) The biogenesis of mitochondria. *The Biochemical Journal*, **116**, 8.
- Schatz, G. (1979) How mitochondria import proteins from the cytoplasm. *FEBS Letters*, **103**, 203–11.
- Schaub, M. and Keller, W. (2002) RNA editing by adenosine deaminases generates RNA and protein diversity. *Biochimie*, **84**, 791–803 (review).
- Schauber, C., Chen, L., Tongaonkar, P. *et al.* (1998) Rad23 links DNA repair to the ubiquitin/proteasome pathway. *Nature*, **391**, 715–718.
- Scheffner, M., Nuber, U., and Huibregtse, J.M. (1995) Protein ubiquitination involving an E1–E2–E3 enzyme ubiquitin thioester cascade. *Nature*, **373**, 81–83.
- Schekman, R. and Orci, L. (1996) Coat proteins and vesicle budding. *Science*, **271**, 1526–1533 (review).
- Schekman, R. and Payne, G. (1988) Clathrin: a matter of life or death? *Science*, **239**, 919.
- Schekman, R., Barlowe, C., Bednarek, S. *et al.* (1995) Coat proteins and selective protein packaging into transport vesicles. *Cold Spring Harbor Symposia on Quantitative Biology*, **60**, 11–21 (review).
- Schekman, R. (1985) Protein localization and membrane traffic in yeast. *Annual Review of Cell Biology*, **1**, 115–143 (review).
- Schekman, R. (1992) Genetic and biochemical analysis of vesicular traffic in yeast. *Current Opinion in Cell Biology*, **4**, 587–592 (review).
- Schekman, R.W. (1994–1995) Regulation of membrane traffic in the secretory pathway. *Harvey Lectures*, **90**, 41–57 (review).
- Schell, M.A. and Wilson, D.B. (1979) Cloning and expression of the yeast galactokinase gene in an *Escherichia coli* plasmid. *Genetics*, **5**, 291–303.
- Scherer, P.E., Krieg, U.C., Hwang, S.T., Vestweber, D., and Schatz, G. (1990) A precursor protein partly translocated into yeast mitochondria is bound to a 70 kd mitochondrial stress protein. *The EMBO Journal*, **9**, 4315–4322.
- Scherer, P.E., Manning-Krieg, U.C., Jenö, P., Schatz, G., and Horst, M. (1992) Identification of a 45-kDa protein at the protein import site of the yeast mitochondrial inner membrane. *Proceedings of the National Academy of Sciences of the United States of America*, **89**, 11930–11934.
- Schäfer, A., and Wolf, D.H. (2005) Yeast genomics in the elucidation of endoplasmic reticulum (ER) quality control and associated protein degradation (ERQD). *Methods in Enzymology*, **399**, 459–68.
- Schäfer, T., Strauß, D., Petfalski, E., Tollervey, D. and Hurt, E. (2003) The path from nucleolar 90S to cytoplasmic 40S pre-ribosomes. *The EMBO Journal*, **22**, 1370–1380.
- Schindler, C. and Spang, A. (2007) Interaction of SNAREs with ArfGAPs precedes recruitment of Sec18p/NSF. *Molecular Biology of the Cell*, **18**, 2852–2863.
- Schlossmann, J., Dietmeier, K., Pfanner, N., and Neupert, W. (1994) Specific recognition of mitochondrial preproteins by the cytosolic domain of the import receptor MOM72. *The Journal of Biological Chemistry*, **269**, 11893–11901.
- Schlossmann, J., Lill, R., Neupert, W., and Court, D.A. (1996) Tom71, a novel homologue of the mitochondrial preprotein receptor Tom70. *The Journal of Biological Chemistry*, **271**, 17890–17895.
- Schlumpberger, M., Wille, H., Baldwin, M.A., Butler, D.A., Herskowitz, I., and Prusiner, S. B. (2000) The prion domain of yeast Ure2p induces autocatalytic formation of amyloid fibers by a recombinant fusion protein. *Protein Science*, **9**, 440–451.
- Schlumpberger, M., Prusiner, S.B., and Herskowitz, I. (2001) Induction of distinct [URE3] yeast prion strains. *Molecular and Cellular Biology*, **21**, 7035–7046.
- Schmelzle, T., Beck, T., Martin, D.E., and Hall, M.N. (2004) Activation of the RAS/cyclic AMP pathway suppresses a TOR deficiency in yeast. *Molecular and Cellular Biology*, **24**, 338–351.
- Schmid, M. and Jensen, T.H. (2008) The exosome: a multipurpose RNA-decay machine. *Trends in Biochemical Sciences*, **33**, 501–510.
- Schmid, H.P., Akhayat, O., Martins De Sa, C., Puvion, F., Koehler, K., and Scherrer, K. (1984) The prosome: an ubiquitous morphologically distinct RNP particle associated with repressed mRNPs and containing specific scRNA and a characteristic set of proteins. *The EMBO Journal*, **3**, 29–34.
- Schmidt, O., Mao, J., Ogden, R. *et al.* (1980) Dimeric tRNA precursors in yeast. *Nature*, **287**, 750–752.
- Schmidt, A., Kellermann, J., and Lottspeich, F. (2005) A novel strategy for quantitative proteomics using isotope-coded protein labels. *Proteomics*, **5**, 4–15.
- Schmitt, M.J. and Breinig, F. (2006) Yeast viral killer toxins; lethality and self-protection. *Nature Reviews Microbiology*, **4**, 212–221.
- Schmitt, H.D., Wagner, P., Pfaff, E., and Gallwitz, D. (1986) The *ras*-related *YPT1* gene product in yeast: a GTP-binding protein that might be involved in microtubule organization. *Cell*, **47**, 401–412.
- Schmitz, H.P. and Philippsen, P. (2011) Evolution of multinucleated *Ashbya gossypii* hyphae from a budding yeast-like ancestor. *Fungal Biology*, **115**, 557–568.
- Schnall, R., Mannhaupt, G., Stucka, R. *et al.* (1994) Identification of a set of yeast genes coding for a novel family of putative ATPases with high similarity to constituents of the 26S protease complex. *Yeast (Chichester, England)*, **10**, 1141–1151.
- Schneider, J.C. and Guarente, L. (1991) Regulation of the yeast *CYT1* gene encoding cytochrome *c*₁ by *HAP1* and *HAP2/3/4*. *Molecular and Cellular Biology*, **10**, 4934–4942.
- Schneider, H., Arretz, M., Wachter, E., and Neupert, W. (1990) Matrix processing peptidase of mitochondria. Structure–function relationships. *The Journal of Biological Chemistry*, **265**, 9881–9887.
- Schneider, A., Behrens, M., Scherer, P., Pratje, E., Michaelis, G., and Schatz, G. (1991a) Inner

- membrane protease I, an enzyme mediating intramitochondrial protein sorting in yeast. *The EMBO Journal*, **10**, 247–254.
- Schneider, H., Sollner, T., Dietmeier, K. *et al.* (1991b) Targeting of the master receptor MOM19 to mitochondria. *Science*, **254**, 1659–1662.
- Schneider, H.C., Westermann, B., Neupert, W., and Brunner, M. (1996) The nucleotide exchange factor MGE exerts a key function in the ATP-dependent cycle of mt-Hsp70–Tim44 interaction driving mitochondrial protein import. *The EMBO Journal*, **15**, 5796–5803.
- Schneider, S., Hotz, H.R., and Schwer, B. (2002) Characterization of dominant-negative mutants of the DEAH-box splicing factors Prp22 and Prp16. *The Journal of Biological Chemistry*, **277**, 15452–15458.
- Schneider, S., Campodonico, E., and Schwer, B. (2004) Motifs IV and V in the DEAH box splicing factor Prp22 are important for RNA unwinding, and helicase-defective Prp22 mutants are suppressed by Prp8. *The Journal of Biological Chemistry*, **279**, 8617–8626.
- Schneider, D.A., French, S.L., Osheim, Y.N. *et al.* (2006) RNA polymerase II elongation factors Spt4p and Spt5p play roles in transcription elongation by RNA polymerase I and rRNA processing. *Proceedings of the National Academy of Sciences of the United States of America*, **103**, 12707–12712.
- Schnell, J.D. and Hicke, L. (2003) Non-traditional functions of ubiquitin and ubiquitin-binding proteins. *The Journal of Biological Chemistry*, **278**, 35857–35860 (review).
- Schott, D., Huffaker, T., and Bretscher, A. (2002) Microfilaments and microtubules: the news from yeast. *Curr Opin Microbiol.*, **5**, 564–574.
- Schott, D., Huffaker, T., and Bretscher, A. (2002) Microfilaments and microtubules: the news from yeast. *Current Opinion in Microbiology*, **5**, 564–574.
- Schramm, L. and Hernandez, N. (2002) Recruitment of RNA polymerase III to its target promoters. *Genes and Development*, **16**, 2593–2620.
- Schreiber, S.L. and Bernstein, B.E. (2002) Signaling network model of chromatin. *Cell*, **11**, 771–778.
- Schu, P.V., Takegawa, K., Fry, M.J., Stack, J.H., Waterfield, M.D., and Emr, S.D. (1993) Phosphatidylinositol 3-kinase encoded by yeast VPS34 gene essential for protein sorting. *Science*, **260**, 88–91.
- Schuberth, C. and Buchberger, A. (2005) Membrane-bound Ubx2 recruits Cdc48 to ubiquitin ligases and their substrates to ensure efficient ER-associated protein degradation. *Nature Cell Biology*, **7**, 999–1006.
- Schuberth, C., Richly, H., Rumpf, S., and Buchberger, A. (2004) Shp1 and Ubx2 are adaptors of Cdc48 involved in ubiquitin-dependent protein degradation. *EMBO Reports*, **5**, 818–824.
- Schuller, C., Brewster, J.L., Alexander, M.R., Gustin, M.C., and Ruis, H. (1994) The HOG pathway controls osmotic regulation of transcription via the stress response element (STRE) of the *Saccharomyces cerevisiae* *CTT1* gene. *The EMBO Journal*, **13**, 4382–4389.
- Schuller, D., Pereira, L., Alves, H. *et al.* (2007) Genetic characterization of commercial *Saccharomyces cerevisiae* isolates recovered from vineyard environments. *Yeast (Chichester, England)*, **24**, 625–636.
- Schultz, P., Celia, H., Riva, M. *et al.* (1990) Structural study of the yeast RNA polymerase A. Electron microscopy of lipid-bound molecules and two-dimensional crystals. *Journal of Molecular Biology*, **216**, 353–362.
- Schultz, P., Celia, H., Riva, M., Sentenac, A., and Oudet, P. (1993) Three-dimensional model of yeast RNA polymerase I determined by electron microscopy of two-dimensional crystals. *The EMBO Journal*, **12**, 2601–2607.
- Schulz, V.P. and Zakian, V.A. (1994) The *Saccharomyces PIF1* DNA helicase inhibits telomere elongation and *de novo* telomere formation. *Cell*, **76**, 145–155.
- Schuyler, S.C., Liu, J.Y., and Pellman, D. (2003) The molecular function of Ase1p: evidence for a MAP-dependent midzone-specific spindle matrix. Microtubule-associated proteins. *The Journal of Cell Biology*, **160**, 517–528.
- Schwartz, M.A. and Madhani, H.D. (2004) Principles of MAP kinase signalling specificity in *Saccharomyces cerevisiae*. *Annual Review of Genetics*, **38**, 725–748 (review).
- Schwartz, E.M. and Stone, R.J. (eds) (1990) *Intervening Sequences in Evolution and Development*, Oxford University Press, New York.
- Schwartz, K., Richards, K., and Botstein, D. (1997) BIM1 encodes a microtubule-binding protein in yeast. *Molecular Biology of the Cell*, **8**, 2677–2691.
- Schwartz, S.H., Silva, J., Burstein, D., Pupko, T., Eyras, E., and Ast, G. (2008) Large-scale comparative analysis of splicing signals and their corresponding splicing factors in eukaryotes. *Genome Research*, **18**, 88–103.
- Schwarz, S.E., Matuschewski, K., Liakopoulos, D., Scheffner, M., and Jentsch, S. (1998) The ubiquitin-like proteins SMT3 and SUMO-1 are conjugated by the UBC9 E2 enzyme. *Proceedings of the National Academy of Sciences of the United States of America*, **95**, 560–564.
- Schwechheimer, C. (2004) The COP9 signalosome (CSN): an evolutionary conserved proteolysis regulator in eukaryotic development. *Biochimica et Biophysica Acta*, **1695**, 45–54.
- Schwer, B. and Guthrie, C. (1991) Prp16 is an RNA-dependent ATPase that interacts transiently with the spliceosome. *Nature*, **349**, 494–499.
- Schwikowski, B., Uetz, P. and Fields, S. (2000) A network of protein–protein interactions in yeast. *Nature Biotechnology*, **18**, 1257–1261.
- Schwimmer, C., Rak, M., Lefebvre-Legendre, L., Duvezin-Caubet, S., Plane, G., and di Rago, J. P. (2006) Yeast models of human mitochondrial diseases: from molecular mechanisms to drug screening. *Journal of Biotechnology*, **1**, 270–281 (review).
- Schwob, E. and Nasmyth, K. (1993) *CLB5* and *CLB6*, a new pair of B cyclins involved in DNA replication in *Saccharomyces cerevisiae*. *Genes and Development*, **7**, 1160–1175.
- Schwob, E., Bohm, T., Mendenhall, M.D., and Nasmyth, K. (1994) The B-type cyclin kinase inhibitor p40SIC1 controls the G₁ to S transition in *S. cerevisiae*. *Cell*, **79**, 233–244.
- Scott, D.C. and Schekman, R. (2008) Role of Sec61p in the ER-associated degradation of short-lived transmembrane proteins. *The Journal of Cell Biology*, **181**, 1095–1105.
- Scott, P.M., Bilodeau, P.S., Zhdankina, O. *et al.* (2004) GGA proteins bind ubiquitin to facilitate sorting at the trans-Golgi network. *Nature Cell Biology*, **6**, 252–259.
- Seah, T.C.M. and Kaplan, J.G. (1973) Purification and properties of the catalase of baker's yeast. *The Journal of Biological Chemistry*, **9**, 121–129.
- Seaman, M.N., McCaffery, J.M., and Emr, S.D. (1998) A membrane coat complex essential for endosome-to-Golgi retrograde transport in yeast. *The Journal of Cell Biology*, **142**, 665–681.
- Segal, M. and Bloom, K. (2001) Control of spindle polarity and orientation in *S. cerevisiae*. *Trends in Cell Biology*, **11**, 160–166.
- Segal, E. and Widom, J. (2009) What controls nucleosome positions? *Trends in Genetics*, **25**, 335–343.
- Seger, S., Rischatsch, R., and Philippsen, P. (2011) Formation and stability of eisosomes in the filamentous fungus *Ashbya gossypii*. *Journal of Cell Science*, **124**, 1629–1634.
- Seglen, P.O. and Bohley, P. (1992) Autophagy and other vacuolar protein degradation mechanisms. *Experientia*, **48**, 158–172 (review).
- Segref, A., Sharma, K., Doye, V. *et al.* (1997) Mex67p, a novel factor for nuclear mRNA export, binds to both poly(A) RNA and nuclear pores. *The EMBO Journal*, **16**, 3256–3271.
- Segura, M.P., Lilley, K.S., and Dupree, P. (2010) Proteomic complex detection using sedimentation (ProCoDeS): screening for proteins in stable complexes and their candidate interaction partners. *Biochemical Society Transactions*, **38**, 923–927.
- Seiler, H. and Busse, M. (1990) The yeasts of cheese brines. *International Journal of Food Microbiology*, **11**, 289–303.
- Sekiguchi, T., Hayashi, N., Wang, Y., and Kobayashi, H. (2008) Genetic evidence that Ras-like GTPases, Gtr1p, and Gtr2p, are involved in epigenetic control of gene expression in *Saccharomyces cerevisiae*. *Biochemical and Biophysical Research Communications*, **368**, 748–754.
- Sellam, A., Hogues, H., Askev, C. *et al.* (2010) Experimental annotation of the human pathogen *Candida albicans* coding and noncoding transcribed regions using high-resolution tiling arrays. *Genome Biology*, **11**, R71.
- Semenza, J.C. and Pelham, H.R. (1992) Changing the specificity of the sorting receptor for luminal endoplasmic reticulum proteins. *Journal of Molecular Biology*, **224**, 1–5.
- Semenza, J.C., Hardwick, K.G., Dean, N., and Pelham, H.R. (1990) *ERD2*, a yeast gene required for the receptor-mediated retrieval of luminal ER proteins from the secretory pathway. *Cell*, **61**, 1349–1357.
- Senderek, J., Krieger, M., Stendel, C. *et al.* (2005) Mutations in SIL1 cause Marinesco–Sjogren syndrome, a cerebellar ataxia with cataract and myopathy. *Nature Genetics*, **37**, 1312–1314.
- SenGupta, D.J., Wickens, M., and Fields, S. (1999) Identification of RNAs that bind to a specific protein using the yeast three-hybrid system. *RNA (New York, NY)*, **5**, 596–601.

- Sentenac, A. (1985) Eukaryotic RNA polymerases. *CRC Critical Reviews in Biochemistry*, **18**, 31–90 (review).
- Seoighe, C., Federspiel, N., Jones, T. et al. (2000) Prevalence of small inversions in yeast gene order evolution. *Proceedings of the National Academy of Sciences of the United States of America*, **97**, 14433–14437.
- Seol, J.H., Feldman, R.M., Zachariae, W. et al. (1999) Cdc53/cullin and the essential Hrt1 RING-H2 subunit of SCF define a ubiquitin ligase module that activates the E2 enzyme Cdc34. *Genes and Development*, **13**, 1614–1626.
- Seong, C., Colavito, S., Kwon, Y., Sung, P., and Krejci, L. (2009) Regulation of Rad51 recombinase presynaptic filament assembly via interactions with the Rad52 mediator and the Srs2 anti-recombinase. *The Journal of Biological Chemistry*, **284**, 24363–24371.
- Serebriiskii, I., Khazak, V., and Golemis, E.A. (1999) A two-hybrid dual bait system to discriminate specificity of protein interactions. *The Journal of Biological Chemistry*, **274**, 17080–17087.
- Seret, M.-L., Diffels, J.F., Goffeau, A., and Baret, P.F. (2009) Combined phylogeny and neighborhood analysis of the evolution of the ABC transporters conferring multiple drug resistance in hemiascomycete yeasts. *BMC Genomics*, **10**, 459.
- Seron, K., Tieaho, V., Prescianotto-Baschong, C. et al. (1998) A yeast t-SNARE involved in endocytosis. *Molecular Biology of the Cell*, **9**, 2873–2889.
- Sertil, O., Kapoor, R., Cohen, B.D., Abramova, N., and Lowry, C.V. (2003) Synergistic repression of anaerobic genes by Mot3 and Rox1 in *Saccharomyces cerevisiae*. *Nucleic Acids Research*, **31**, 5831–5837.
- Sesaki, H., Dunn, C.D., Iijima, M. et al. (2006) Ups1p, a conserved intermembrane space protein, regulates mitochondrial shape and alternative topogenesis of Mgm1p. *The Journal of Cell Biology*, **173**, 651–658.
- Sethy, I., Moir, R.D., Librizzi, M., and Willis, I.M. (1995) In vitro evidence for growth regulation of tRNA gene transcription in yeast. A role for transcription factor (TF) IIIB70 and TFIIC. *The Journal of Biological Chemistry*, **270**, 28463–2870.
- Seufert, W. and Jentsch, S. (1990) Ubiquitin-conjugating enzymes UBC4 and UBC5 mediate selective degradation of short-lived and abnormal proteins. *The EMBO Journal*, **9**, 543–550.
- Seymour, I.J. and Piper, P.W. (1999) Stress induction of HSP30, the plasma membrane heat shock protein gene of *Saccharomyces cerevisiae*, appears not to use known stress-regulated transcription factors. *Microbiology (Reading, England)*, **145**, 231–239.
- Shaheen, H.H. and Hopper, A.K. (2005) Retrograde movement of tRNAs from the cytoplasm to the nucleus in *Saccharomyces cerevisiae*. *Proceedings of the National Academy of Sciences of the United States of America*, **102**, 11290–11295.
- Shakoury-Elizeh, M., Tiedeman, J., Rashford, J. et al. (2004) Transcriptional remodeling in response to iron deprivation in *Saccharomyces cerevisiae*. *Molecular Biology of the Cell*, **15**, 1233–1243.
- Shaner, N.C., Campbell, R.E., Steinbach, P.A., Giepmans, B.N., Palmer, A.E., and Tsien, R.Y. (2004) Improved monomeric red, orange and yellow fluorescent proteins derived from *Discosoma* sp. red fluorescent protein. *Nature Biotechnology*, **22**, 1567–1572.
- Sharma, K.G., Mason, D.L., Liu, G., Rea, P.A., Bachhawat, A.K., and Michaelis, S. (2002) Localization, regulation, and substrate transport properties of Bpt1p, a *Saccharomyces cerevisiae* MRP-type ABC transporter. *Eukaryotic Cell*, **1**, 391–400.
- Sharp, J.A., Franco, A.A., Osley, M.A., and Kaufman, P.D. (2002) Chromatin assembly factor I and Hir proteins contribute to building functional kinetochores in *S. cerevisiae*. *Genes and Development*, **16**, 85–100.
- Sharp, P.A. (1993) *Split genes and RNA splicing. Nobel Lecture*, http://nobelprize.org/nobel_prizes/medicine/laureates/1993/sharp-lecture.html.
- Shaw, P. and Doonan, J. (2005) The nucleolus. *Cell Cycle (Georgetown, Tex.)*, **4**, 102–105.
- Sheldon, K.E., Mauger, D.M., and Arndt, K.M. (2005) A Requirement for the *Saccharomyces cerevisiae* Paf1 complex in snRNA 3' end formation. *Molecular Cell*, **20**, 225–236.
- Shen, Y.Q. and Burger, G. (2009) Plasticity of a key metabolic pathway in fungi. *Functional & Integrative Genomics*, **9**, 145–151.
- Shen, W.C., Bhaumik, S.R., Causton, H.C. et al. (2003) Systematic analysis of essential yeast TAFs in genome-wide transcription and preinitiation complex assembly. *The EMBO Journal*, **22**, 3395–3402.
- Shepard, K.A., Gerber, A.P., Jambhekar, A. et al. (2003) Widespread cytoplasmic mRNA transport in yeast: identification of 22 bud-localized transcripts using DNA microarray analysis. *Proceedings of the National Academy of Sciences of the United States of America*, **100**, 11429–11434.
- Sherman, M.Y. and Muchowski, P.J. (2003) Making yeast tremble: yeast models as tools to study neurodegenerative disorders. *Neuromolecular Medicine*, **4**, 133–146 (review).
- Sherman, F. and Slonimski, P.P. (1964) Respiration-deficient mutants of yeast. II. Biochemistry. *Biochimica et Biophysica Acta*, **90**, 1–15.
- Sherman, D.J., Martin, T., Nikolski, M., Cayla, C., Souciet, J.-L., and Durrens, P. (2009) Génolevures: protein families and synteny among complete hemiascomycetous yeast proteomes and genomes. *Nucleic Acids Research*, **37** (Suppl. 1), D550–D554.
- Sheth, U. and Parker, R. (2003) Decapping and decay of messenger RNA occur in cytoplasmic processing bodies. *Science*, **300**, 805–808.
- Sheth, U. and Parker, R. (2006) Targeting of aberrant mRNAs to cytoplasmic processing bodies. *Cell*, **125**, 1095–1099.
- Sheu, Y.J. and Stillman, B. (2006) Cdc7–Dbf4 phosphorylates MCM proteins via a docking site-mediated mechanism to promote S phase progression. *Molecular Cell*, **24**, 101–113.
- Sheu, Y.J., Barral, Y., and Snyder, M. (2000) Polarized growth controls cell shape and bipolar bud site selection in *Saccharomyces cerevisiae*. *Molecular and Cellular Biology*, **20**, 5235–5247.
- Shevchenko, A., Jensen, O.N., Podtelejnikov, A. V. et al. (1996) Linking genome and proteome by mass spectrometry: large scale identification of yeast proteins from two-dimensional gels. *Proceedings of the National Academy of Sciences of the United States of America*, **93**, 14440–14445.
- Shevchenko, A., Roguev, A., Schaft, D. et al. (2008) Chromatin Central: towards the comparative proteome by accurate mapping of the yeast proteomic environment. *Genome Biology*, **9**, R167.
- Shi, N.Q. and Jeffries, T.W. (1998) Anaerobic growth and improved fermentation of *Pichia stipitis* bearing a URA1 gene from *Saccharomyces cerevisiae*. *Applied Microbiology and Biotechnology*, **50**, 339–345.
- Shi, X., Finkelstein, A., Wolf, A.J., Wade, P.A., Burton, Z.F., and Jaehning, J.A. (1996) Paf1p, an RNA polymerase II-associated factor in *Saccharomyces cerevisiae*, may have both positive and negative roles in transcription. *Molecular and Cellular Biology*, **16**, 669–676.
- Shi, X., Chang, M., Wolf, A.J. et al. (1997) Cdc73p and Paf1p are found in a novel RNA polymerase II-containing complex distinct from the Srbp-containing holoenzyme. *Molecular and Cellular Biology*, **17**, 1160–1169.
- Shiba, Y., Katoh, Y., Shiba, T. et al. (2004) GAT (GGA and Tom1) domain responsible for ubiquitin binding and ubiquitination. *The Journal of Biological Chemistry*, **279**, 7105–7111.
- Shiba, Y., Paradise, E.M., Kirby, J., Ro, D.K., and Keasling, J.D. (2007) Engineering of the pyruvate dehydrogenase bypass in *Saccharomyces cerevisiae* for high-level production of isoprenoids. *Metabolic Engineering*, **9**, 160–168.
- Shibasaki, S., Kawabata, A., Tanino, T., Kondo, A., Ueda, M., and Tanaka, M. (2009a) Evaluation of the biodegradability of polyurethane and its derivatives by using lipase-displaying arming yeast. *Biocontrol Science*, **14**, 171–175.
- Shibasaki, S., Maeda, H., and Ueda, M. (2009b) Molecular display technology using yeast-arming technology. *Analytical Science*, **25**, 41–49.
- Shigechi, H., Uyama, K., Matsumoto, T. et al. (2002) Efficient ethanol production from starch through development of novel flocculent yeast strains displaying glucoamylase and co-displaying or secreting α -amylase. *Journal of Molecular Catalysis B: Enzymatic*, **17**, 179–187.
- Shih, S.C., Sloper-Mould, K.E., and Hicke, L. (2000) Monoubiquitin carries a novel internalization signal that is appended to activated receptors. *The EMBO Journal*, **19**, 187–198.
- Shilatifard, A. (2006) Chromatin modifications by methylation and ubiquitination: implications in the regulation of gene expression. *Annual Review of Biochemistry*, **75**, 243–269.
- Shima, D.T., Scales, S.J., Kreis, T.E., and Pepperkok, R. (1999) Segregation of COPI-rich and anterograde-cargo-rich domains in endoplasmic-reticulum-to-Golgi transport complexes. *Current Biology*, **9**, 821–824.
- Shimada, H., Kondo, K., Fraser, P.D., Miura, Y., Saito, T., and Misawa, N. (1998) Increased carotenoid production by the food yeast *Candida utilis* through metabolic engineering

- of the isoprenoid pathway. *Applied and Environmental Microbiology*, **64**, 2676–2680.
- Shimizu, M., Roth, S.Y., Szent-Gyorgyi, C., and Simpson, R.T. (1991) Nucleosomes are positioned with base pair precision adjacent to the alpha2 operator in *Saccharomyces cerevisiae*. *The EMBO Journal*, **10**, 3033–3041.
- Shimoda, C. and Nakamura, T. (2004) Control of late meiosis and ascospore formation, in *The Molecular Biology of Schizosaccharomyces pombe* (ed. R. Egel), Springer, Berlin, pp. 311–327.
- Shimoda, C. (2004) Forespore membrane assembly in yeast: coordinating SPBs and membrane trafficking. *Journal of Cell Science*, **17**, 389–395.
- Shintomi, K. and Hirano, T. (2007) How are cohesin rings opened and closed? *Trends in Biochemical Sciences*, **32**, 154–157.
- Shirayama, M., Zachariae, W., Ciosk, R., and Nasmyth, K. (1998) The Polo-like kinase Cdc5p and the WD-repeat protein Cdc20p/fizzy are regulators and substrates of the anaphase promoting complex in *Saccharomyces cerevisiae*. *The EMBO Journal*, **17**, 1336–1349.
- Shore, D. and Nasmyth, K. (1987) Purification and cloning of a DNA binding protein from yeast that binds to both silencer and activator elements. *Cell*, **51**, 721–732.
- Shore, D., Stillman, D.J., Brand, A.H., and Nasmyth, K.A. (1987) Identification of silencer binding proteins from yeast: possible roles in SIR control and DNA replication. *The EMBO Journal*, **6**, 461–467.
- Shore, D. (1994) RAP1: a protean regulator in yeast. *Trends in Genetics*, **10**, 408–412 (review).
- Shore, D. (1997) Telomerase and telomere-binding proteins: controlling the endgame. *Trends in Biochemical Sciences*, **22**, 233–235 (review).
- Shore, D. (1998) Cellular senescence: lessons from yeast for human aging? *Current Biology*, **8**, R192–R195 (review).
- Shore, D. (2000) The Sir2 protein family: a novel deacetylase for gene silencing and more. *Proceedings of the National Academy of Sciences of the United States of America*, **97**, 14030–14032 (review).
- Shore, D. (2001) Telomeric chromatin: replicating and wrapping up chromosome ends. *Current Opinion in Genetics & Development*, **11**, 189–198 (review).
- Shorter, J. (2010) Emergence and natural selection of drug-resistant prions. *Molecular BioSystems*, **6**, 1115–1130.
- Shou, W., Seol, J.H., Shevchenko, A. et al. (1999) Exit from mitosis is triggered by Tem1-dependent release of the protein phosphatase Cdc14 from nucleolar RENT complex. *Cell*, **97**, 233–244.
- Sia, R.A., Herald, H.A., and Lew, D.J. (1996) Cdc28 tyrosine phosphorylation and the morphogenesis checkpoint in budding yeast. *Molecular Biology of the Cell*, **7**, 1657–1666.
- Sicard, D. and Legras, J.-L. (2011) Bread, beer and wine: Yeast domestication in the *Saccharomyces sensu stricto* complex. *Comptes Rendus Biologies*, **334**, 229–236.
- Sickmann, A., Reinders, J., Wagner, Y. et al. (2003) The proteome of *Saccharomyces cerevisiae* mitochondria. *Proceedings of the National Academy of Sciences of the United States of America*, **100**, 13207–13212.
- Sideri, T.C., Willetts, S.A., and Avery, S.V. (2009) Methionine sulphoxide reductases protect iron–sulphur clusters from oxidative inactivation in yeast. *Microbiology (Reading, England)*, **155**, 612–623.
- Sidrauski, C. and Walter, P. (1997) The transmembrane kinase Ire1p is a site-specific endonuclease that initiates mRNA splicing in the unfolded protein response. *Cell*, **90**, 1031–1039.
- Siergiejuk, E., Scott, D.C., Schulman, B.A., Hofmann, K., Kurz, T., and Peter, M. (2009) Cullin neddylation and substrate-adaptors counteract SCF inhibition by the CAND1-like protein Lag2 in *Saccharomyces cerevisiae*. *The EMBO Journal*, **28**, 3845–3856.
- Sietmann, R., Uebe, R., Boer, E., Bode, R., Kunze, G., and Schauer, F. (2009) Novel metabolic routes during the oxidation of hydroxylated aromatic acids by the yeast *Arcula adenivorans*. *Journal of Applied Microbiology*, **108**, 789–799.
- Sikorski, R.S. and Hieter, P. (1989) A system of shuttle vectors and yeast host strains designed for efficient manipulation of DNA in *Saccharomyces cerevisiae*. *Genetics*, **122**, 19–27.
- Silar, P., Butler, G. and Thiele, D.J. (1991) Heat shock transcription factor activates transcription of the yeast metallothionein gene. *Molecular and Cellular Biology*, **11**, 1232–1238.
- Siligardi, G., Hu, B., Panaretou, B., Piper, P.W., Pearl, L.H., and Prodromou, C. (2004) Co-chaperone regulation of conformational switching in the Hsp90 ATPase cycle. *The Journal of Biological Chemistry*, **279**, 51989–51998.
- Silva, S., Negri, M., Henriques, M., Oliveira, R., Williams, D.W., and Azeredo, J. (2011) Adherence and biofilm formation of non-*Candida albicans* *Candida* species. *Trends in Microbiology*, **19**, 241–247.
- Silverman, S.J. and Fink, G.R. (1984) Effects of Ty insertions on HIS4 transcription in *Saccharomyces cerevisiae*. *Molecular and Cellular Biology*, **4**, 1246–1251.
- Silverman, E.J., Maeda, A., Wei, J., Smith, P., Beggs, J.D., and Lin, R.J. (2004) Interaction between a G-patch protein and a spliceosomal DEXD/H-box ATPase that is critical for splicing. *Molecular and Cellular Biology*, **24**, 10101–10110.
- Simanis, V. and Nurse, P. (1986) The cell cycle control gene *cdc2⁺* of fission yeast encodes a protein kinase potentially regulated by phosphorylation. *Cell*, **45**, 261–268.
- Simchen, G., Chapman, K.B., Caputo, E., Nam, K., Riles, L., Levin, D.E., Boeke, J.D. (1994) Mapping of DBR1 and YPK1 suggests a major revision of the genetic map of the left arm of *Saccharomyces cerevisiae* Chromosome XI. *Genetics*, **138**, 283–287.
- Simpson, R.T. (1998) Chromatin structure and analysis of mechanisms of activators and repressors. *Methods (San Diego, Calif.)*, **15**, 283–294 (review).
- Sinclair, D.A. and Guarente, L. (1997) Accelerated aging and nucleolar fragmentation in yeast *sgs1* mutants. *Cell*, **91**, 1033–1042.
- Sinclair, D.A., Mills, K.D., and Guarente, L. (1997) Extrachromosomal rDNA circles – a cause of aging in yeast. *Science*, **277**, 1313–1316.
- Sinclair, D.A., Mills, K.D., and Guarente, L. (1998) Aging in *Saccharomyces cerevisiae*. *Annual Review of Microbiology*, **52**, 533–560.
- Singer-Kruger, B., Stenmark, H., Dusterhoft, A. et al. (1994) Role of three rab5-like GTPases, Ypt51p, Ypt52p, and Ypt53p, in the endocytic and vacuolar protein sorting pathways of yeast. *The Journal of Cell Biology*, **125**, 283–298.
- Singleton, M.R., Dillingham, M.S., and Wigley, D.B. (2007) Structure and mechanism of helicases and nucleic acid translocases. *Annual Review of Biochemistry*, **76**, 23–50.
- Siniosoglou, S., and Pelham, H.R. (2001) An effector of Ypt6p binds the SNARE Tlg1p and mediates selective fusion of vesicles with late Golgi membranes. *The EMBO Journal*, **20**, 5991–5998.
- Sirrenberg, C., Bauer, M.F., Guiard, B., Neupert, W., and Brunner, M. (1996) Import of carrier proteins into the mitochondrial inner membrane mediated by Tim22. *Nature*, **384**, 582–585.
- Sirrenberg, C., Endres, M., Folsch, H., Stuart, R. A., Neupert, W., and Brunner, M. (1998) Carrier protein import into mitochondria mediated by the intermembrane proteins Tim10/Mrs11 and Tim12/Mrs5. *Nature*, **391**, 912–915.
- Sismour, A.M. and Benner, S.A. (2005) Synthetic biology. *Expert Opinion on Biological Therapy*, **5**, 1409–1414.
- Siverio, J.M. (2002) Assimilation of nitrate by yeasts. *FEMS Microbiology Reviews*, **26**, 277–284.
- Sjogren, C. and Nasmyth, K. (2001) Sister chromatid cohesion is required for postreplicative double-strand break repair in *Saccharomyces cerevisiae*. *Current Biology*, **11**, 991–995.
- Sjostrand, J.O., Kegel, A., and Astrom, S.U. (2002) Functional diversity of silencers in budding yeasts. *Eukaryotic Cell*, **1**, 548–557.
- Skibbens, R.V., Corson, L.B., Koshland, D., and Hieter, P. (1999) Ctf7p is essential for sister chromatid cohesion and links mitotic chromosome structure to the DNA replication machinery. *Genes and Development*, **13**, 307–319.
- Sklar, V.E., Schwartz, L.B., and Roeder, R.G. (1975) Distinct molecular structures of nuclear class I, II, and III DNA-dependent RNA polymerases. *Proceedings of the National Academy of Sciences of the United States of America*, **72**, 348–352.
- Sklar, V.E., Jaehning, J.A., Gage, L.P., and Roeder, R.G. (1976) Purification and subunit structure of deoxyribonucleic acid-dependent ribonucleic acid polymerase III from the posterior silk gland of *Bombyx mori*. *The Journal of Biological Chemistry*, **251**, 3794–3800.
- Skowyra, D., Craig, K.L., Tyers, M., Elledge, S.J., and Harper, J.W. (1997) F-box proteins are receptors that recruit phosphorylated substrates to the SCF ubiquitin–ligase complex. *Cell*, **91**, 209–219.
- Skowyra, D., Koepp, D.M., Kamura, T. et al. (1999) Reconstitution of G₁ cyclin ubiquitination with complexes containing SCF^{Grr1} and Rbx1. *Science*, **284**, 662–665.
- Skruzny, M., Schneider, C., Racz, A., Weng, J., Tollervey, D., and Hurt, E. (2009) An endoribonuclease functionally linked to perinuclear mRNP quality control associates

- with the nuclear pore complexes. *PLoS Biology*, 7, e8.
- Slaughter, B.D., Smith, S.E., and Li, R. (2009) Symmetry breaking in the life cycle of the budding yeast. *Cold Spring Harbor Perspectives in Biology*, 1, a003384.
- Smeal, T. and Guarente, L. (1997) Mechanisms of cellular senescence. *Current Opinion in Genetics & Development*, 7, 281–287 (review).
- Smeal, T., Claus, J., Kennedy, B., Cole, F., and Guarente, L. (1996) Loss of transcriptional silencing causes sterility in old mother cells of *S. cerevisiae*. *Cell*, 84, 633–642.
- Smedsgaard, J. and Nielsen, J. (2005) Metabolite profiling of fungi and yeast: from phenotype to metabolome by MS and informatics. *Journal of Experimental Botany*, 56, 273–286.
- Smith, R.L. and Johnson, A.D. (2000) Turning genes off by Ssn6–Tup1: a conserved system of transcriptional repression in eukaryotes. *Trends in Biochemical Sciences*, 25, 325–330 (review).
- Smith, M.G. and Snyder, M. (2006) Yeast as a model for human disease. *Current Protocols in Human Genetics*, Chapter 15, Unit 15.6 (review).
- Smith, S. and Stillman, B. (1989) Purification and characterization of CAF-I, a human cell factor required for chromatin assembly during DNA replication *in vitro*. *Cell*, 58, 15–25.
- Smith, S. and Stillman, B. (1991) Stepwise assembly of chromatin during DNA replication *in vitro*. *The EMBO Journal*, 10, 971–980.
- Smith, H.O. and Wilcox, K. (1969) *Federation Proceedings*, 28, 465.
- Smith, M., Leung, D.W., Gillam, S., Astell, C.R., Montgomery, D.L., and Hall, B.D. (1979) Sequence of the gene for iso-1-cytochrome *c* in *Saccharomyces cerevisiae*. *Cell*, 16, 753–761.
- Smith, H.E., Yu, S.S.Y., Neigeborn, L., Driswell, S.E., and Mitchell, A.P. (1990) Role of *IME1* expression in regulation of meiosis in *Saccharomyces cerevisiae*. *Molecular and Cellular Biology*, 10, 6103–6113.
- Smith, R.L., Redd, M.J., and Johnson, A.D. (1995) The tetratricopeptide repeats of Ssn6 interact with the homeodomain of alpha2. *Genes and Development*, 9, 2903–2910.
- Smith, S., Hwang, J.Y., Banerjee, S. *et al.* (2004) Mutator genes for suppression of gross chromosomal rearrangements identified by a genomewide screening in *Saccharomyces cerevisiae*. *Proceedings of the National Academy of Sciences of the United States of America*, 101, 9039–9044.
- Smith, M.G., Jona, G., Placek, J. *et al.* (2005) Global analysis of protein function using protein microarrays. *Mechanisms of Ageing and Development*, 126, 171–175.
- Smith, D.R., Quinlan, A.R., Peckham, H.E. *et al.* (2008) Rapid whole-genome mutational profiling using next-generation sequencing technologies. *Genome Research*, 18, 1638–1642.
- Smith, R.D., Willett, R., Kudlyk, T. *et al.* (2009) The COG complex, Rab6 and COPI define a novel Golgi retrograde trafficking pathway that is exploited by SubAB toxin. *Traffic (Copenhagen, Denmark)*, 10, 1502–1517.
- Smith, G.P. (1985) Filamentous fusion phage: novel expression vectors that display cloned antigens on the virion surface. *Science*, 228, 1315–1317.
- Smith, M. (1993) *Synthetic DNA and biology. Nobel Lecture*, December 8, 1993, http://nobelprize.org/nobel_prizes/chemistry/laureates/1993/smith-lecture.html.
- Smits, G.J., van den Ende, H., and Klis, F.M. (2001) Differential regulation of cell wall biogenesis during growth and development in yeast. *Microbiology (Reading, England)*, 147, 781–794 (review).
- Smogorzewska, A. and deLange, T. (2004) Regulation of telomerase by telomeric proteins. *Annual Review of Biochemistry*, 73, 177–208.
- Snel, B., Lehmann, G., Bork, P., and Huynen, M.A. (2000) STRING: a web-server to retrieve and display the repeatedly occurring neighbourhood of a gene. *Nucleic Acids Research*, 28, 3442–3444.
- Snider, J. and Houry, W.A. (2008) AAA⁺ proteins: diversity in function, similarity in structure. *Biochemical Society Transactions*, 36, 72–77.
- Snider, J., Thibault, G., and Houry, W.A. (2008) The AAA⁺ superfamily of functionally diverse proteins. *Genome Biology*, 9, 216.
- Sobering, A.K., Jung, U.S., Lee, K.S., and Levin, D.E. (2002) Yeast Rpi1 is a putative transcriptional regulator that contributes to preparation for stationary phase. *Eukaryotic Cell*, 1, 56–65.
- Sobering, A.K., Romeo, M.J., Vay, H.A., and Levin, D.E. (2003) A novel Ras inhibitor, Eri1, engages yeast Ras at the endoplasmic reticulum. *Molecular and Cellular Biology*, 23, 4983–4990.
- Sobering, A.K., Watanabe, R., Romeo, M.J. *et al.* (2004) Yeast Ras regulates the complex that catalyzes the first step in GPI-anchor biosynthesis at the ER. *Cell*, 117, 637–648.
- Soberon, X., Covarrubias, L., and Bolivar, F. (1980) Construction and characterization of new cloning vehicles. IV. Deletion derivatives of pBR322 and pBR325. *Genetics*, 9, 287–305.
- Sogaard, M., Tani, K., Ye, R.R. *et al.* (1994) A Rab protein is required for the assembly of SNARE complexes in the docking of transport vesicles. *Cell*, 78, 937–948.
- Sohn, S.B., Graf, A.B., Kim, T.Y. *et al.* (2010) Genome-scale metabolic model of methylotrophic yeast *Pichia pastoris* and its use for *in silico* analysis of heterologous protein production. *Journal of Biotechnology*, 5, 705–715.
- Somerville, C., Youngs, H., Taylor, C., Davis, S. C., and Long, S. P. (2010) Feedstocks for lignocellulosic biofuels. *Science*, 329, 790–792.
- Sommer, T. and Wolf, D.H. (1997) Endoplasmic reticulum degradation: reverse protein flow of no return. *The FASEB Journal*, 11, 1227–1233 (review).
- Sondheimer, N. and Lindquist, S. (2000) Rnq1: an epigenetic modifier of protein function in yeast. *Molecular Cell*, 5, 163–172.
- Song, Y., Choi, M.H., Park, J.N., Kim, M.W., Kim, E.J., Kang, H.A., Kim, J.Y. (2007) Engineering of the yeast *Yarrowia lipolytica* for the production of glycoproteins lacking the outer-chain mannose residues of N-glycans. *Applied and Environmental Microbiology*, 73, 4446–4454.
- Sopko, R., Raithatha, S., and Stuart, D. (2002) Phosphorylation and maximal activity of *Saccharomyces cerevisiae* meiosis-specific transcription factor Ndt80 is dependent on Ime2. *Molecular and Cellular Biology*, 22, 7024–7040.
- Sopko, R., Huang, D., Preston, N. *et al.* (2006) Mapping pathways and phenotypes by systematic gene overexpression. *Molecular Cell*, 21, 319–330.
- Sorger, P.K. and Pelham, H.R. (1988) Yeast heat shock factor is an essential DNA-binding protein that exhibits temperature-dependent phosphorylation. *Cell*, 54, 855–864.
- Sorger, P.K. (1991) Heat shock factor and the heat shock response. *Cell*, 65, 363–366 (review).
- Souciet, J.L., Aigle, M., Artiguenave, F. *et al.* (2000) Genomic exploration of the hemiascomycetous yeasts. I. A set of yeast species for molecular evolution studies. *FEBS Letters*, 487, 3–12.
- Souciet, J.L., Dujon, B., Gaillardin, C. *et al.* (2009) Comparative genomics of protoplid Saccharomycetaceae. *Genome Research*, 19, 1696–1709.
- Souciet, J.L. (2011) Ten years of the Genolevures Consortium: a brief history. *Comptes Rendus Biologies*, 334, 580–584.
- Spang, A. (2004) Vesicle transport: a close collaboration of Rabs and effectors. *Current Biology*, 14, R33–R34 (review).
- Spear, E. and Ng, D.T. (2001) The unfolded protein response: no longer just a special teams player. *Traffic (Copenhagen, Denmark)*, 2, 515–523.
- Spellman, P.T., Sherlock, G., Zhang, M.Q. *et al.* (1998) Comprehensive identification of cell cycle-regulated genes of the yeast *Saccharomyces cerevisiae* by microarray hybridization. *Molecular Biology of the Cell*, 9, 3273–3297.
- Spencer, F. and Simchen, G. (2001) Transfer of YAC clones to new hosts by karyogamy-deficient mating. *Current Protocols in Human Genetics*, Chapter 5, Unit 5.14.
- Spinazzola, A. and Zeviani, M. (2009) Disorders from perturbations of nuclear–mitochondrial intergenomic cross-talk. *Journal of Internal Medicine*, 265, 174–192.
- Spinnler, H.E., Berger, C., Lapadatescu, C., and Bonnarme, P. (2001) Production of sulfur compounds by several yeasts of technological interest for cheese ripening. *International Dairy Journal*, 11, 245–252.
- Sprague, G.F.Jr, Rine, J., and Herskowitz, I. (1981) Homology and non-homology at the yeast mating type locus. *Nature*, 289, 250–252.
- Sprinzi, M. and Vassilenko, K.S. (2005) Compilation of tRNA sequences and sequences of tRNA genes. *Nucleic Acids Research*, 33, D139–D140.
- Sprinzi, M., Stegborn, C., Hübel, F., and Steinberg, S. (1996) Compilation of tRNA sequences and sequences of tRNA genes. *Nucleic Acids Research*, 24, 68–72, ftp.ebi.ac.uk/pub/databases/tRNA.
- Srinivasan, V., Netz, D.J., Webert, H. *et al.* (2007) Structure of the yeast WD40 domain protein Cia1, a component acting late in iron–sulfur protein biogenesis. *Structure (London, England: 1993)*, 15, 1246–1257.

- Sripati, C.E., Groner, Y., and Warner, J.R. (1976) Methylated, blocked 5' termini of yeast mRNA. *The Journal of Biological Chemistry*, **251**, 2898–2904.
- St John, T.P. and Davis, R.W. (1979) Isolation of galactose-inducible DNA sequences from *Saccharomyces cerevisiae* by differential plaque filter hybridization. *Cell*, **16**, 443–452.
- Stagljar, I., Korostensky, C., Johnsson, N., and Heesen, S. (1998) A genetic system based on splitubiquitin for the analysis of interactions between membrane proteins *in vivo*. *Proceedings of the National Academy of Sciences of the United States of America*, **95**, 5187–5192.
- Stahlberg, H., Kutejova, E., Suda, K. *et al.* (1999) Mitochondrial Lon of *Saccharomyces cerevisiae* is a ring-shaped protease with seven flexible subunits. *Proceedings of the National Academy of Sciences of the United States of America*, **96**, 6787–6790.
- Stahmann, K.P., Revuelta, J.L., and Seulberger, H. (2000) Three biotechnological processes using *Ashbya gossypii*, *Candida famata*, or *Bacillus subtilis* compete with chemical riboflavin production. *Applied Microbiology and Biotechnology*, **53**, 509–516.
- Stahmann, K.P., Arst, H.N.Jr, Althofer, H. *et al.* (2001) Riboflavin, overproduced during sporulation of *Ashbya gossypii*, protects its hyaline spores against ultraviolet light. *Environmental Microbiology*, **3**, 545–550.
- Stajich, J.E., Dietrich, F.S., and Roy, S.W. (2007) Comparative genomic analysis of fungal genomes reveals intron-rich ancestors. *Genome Biology*, **8**, R223.
- Staley, J.P. and Guthrie, C. (1998) Mechanical devices of the spliceosome: motors, clocks, springs, and things. *Cell*, **92**, 315–326 (review).
- Staley, J.P. and Guthrie, C. (1999) An RNA switch at the 5' splice site requires ATP and the DEAD box protein Prp28p. *Mol Cell*, **3**, 55–64.
- Stamnes, M.A., Craighead, M.W., Hoe, M.H. *et al.* (1995) An integral membrane component of coatmer-coated transport vesicles defines a family of proteins involved in budding. *Proceedings of the National Academy of Sciences of the United States of America*, **92**, 8011–8015.
- Stan, T., Ahting, U., Dembowski, M. *et al.* (2000) Recognition of preproteins by the isolated TOM complex of mitochondria. *The EMBO Journal*, **19**, 4895–4902.
- Stanway, C.A. (1991) The transactivator GAL4: co-activators, adaptors and chromatin. *Bioessays*, **13**, 241–242 (review).
- Stark, M.J., Boyd, A., Mileham, A.J., and Romanos, M.A. (1990) The plasmid-encoded killer system of *Kluyveromyces lactis*, a review. *Yeast (Chichester, England)*, **6**, 1–29.
- Stark, C., Breitkreutz, B.J., Chatr-Aryamontri, A. *et al.* (2010) The BioGRID Interaction Database: 2011 update. *Nucleic Acids Research*, **39**, D698–D704.
- Starmer, W.T. and Lachance, M.-A. (2011) Yeast ecology, in *The Yeasts: A Taxonomic Study*, vol. 1 (eds C.P. Kurtzman, J.W. Fell, and T. Boekhout), Elsevier, Amsterdam, pp. 224–277.
- Steensma, H.Y., Crowley, J.C., and Kaback, D.B. (1987) Molecular cloning of chromosome I DNA from *Saccharomyces cerevisiae*: isolation and analysis of the CEN1–ADE1–CDC15 region. *Molecular and Cellular Biology*, **7**, 410–419.
- Steffan, J.S., Keys, D.A., Vu, L., and Nomura, M. (1998) Interaction of TATA-binding protein with upstream activation factor is required for activated transcription of ribosomal DNA by RNA polymerase I in *Saccharomyces cerevisiae* *in vivo*. *Molecular and Cellular Biology*, **18**, 3752–3761.
- Steger, D.J. and Workman, J.L. (1996) Remodeling chromatin structures for transcription: what happens to the histones? *Bioessays*, **18**, 875–884 (review).
- Steger, D.J., Utley, R.T., Grant, P.A. *et al.* (1998) Regulation of transcription by multisubunit complexes that alter nucleosome structure. *Cold Spring Harbor Symposia on Quantitative Biology*, **63**, 483–491 (review).
- Stegmeier, F., Visintin, R. and Amon, A. (2002) Separase, polo kinase, the kinetochore protein Slk19, and Spo12 function in a network that controls Cdc14 localization during early anaphase. *Cell*, **108**, 207–220.
- Steiner, H., Zollner, A., Haid, A., Neupert, W., and Lill, R. (1995a) Biogenesis of mitochondrial heme lyases in yeast. Import and folding in the intermembrane space. *The Journal of Biological Chemistry*, **270**, 22842–22849.
- Steiner, S., Wendland, J., Wright, M.C., and Philippsen, P. (1995b) Homologous recombination as the main mechanism for DNA integration and cause of rearrangements in the filamentous ascomycete *Ashbya gossypii*. *Genetics*, **140**, 973–987.
- Steitz, J.A., Black, D.L., Gerke, V. *et al.* (1988) Function of abundant U-snRNPs, in *Structure and Function of Major and Minor Small Nuclear Ribonucleoprotein Particles* (ed. M.L. Birnstiel), Springer, New York, pp. 115–154.
- Stellwagen, A.E., Haimberger, Z.W., Veatch, J. R., and Gottschling, D.E. (2003) Ku interacts with telomerase RNA to promote telomere addition at native and broken chromosome ends. *Genes and Development*, **17**, 2384–2395.
- Stenmark, H. and Olkkonen, V.M. (2001) The Rab GTPase family. *Genome Biology*, **2**, REVIEWS3007.
- Stern, B. and Nurse, P. (1996) A quantitative model for the cdc2 control of S phase and mitosis in fission yeast. *Trends in Genetics*, **12**, 345–350.
- Stern, M., Jensen, R., and Herskowitz, I. (1984) Five SWI genes are required for expression of the HO gene in yeast. *Journal of Molecular Biology*, **178**, 853–868.
- Stettler, S., Mariotte, S., Riva, M., Sentenac, A., and Thuriaux, P. (1992) An essential and specific subunit of RNA polymerase III (C) is encoded by gene RPC34 in *Saccharomyces cerevisiae*. *The Journal of Biological Chemistry*, **267**, 21390–21395.
- Stevens, S.W. and Abelson, J. (2002) Yeast pre-mRNA splicing: methods, mechanisms, and machinery. *Methods in Enzymology*, **351**, 200–220.
- Stevens, T., Esmon, B., and Schekman, R. (1982) Early stages in the yeast secretory pathway are required for transport of carboxypeptidase Y to the vacuole. *Cell*, **30**, 439–448.
- Stevens, S.W., Ryan, D.E., Ge, H.Y. *et al.* (2002) Composition and functional characterization of the yeast spliceosomal penta-snRNP. *Molecular Cell*, **9**, 31–44.
- Stewart, J.W. and Sherman, F. (1974) Yeast frameshift mutations identified by sequence changes in iso-1-cytochrome *c*, in *Molecular and Environmental Aspects of Mutagenesis* (eds L. Prakash, F. Sherman, M.W. Miller, C.W. Lawrence, and H.W. Taber), Charles C. Thomas, Springfield, IL, pp. 102–107.
- Stillman, B.W. and Gluzman, Y. (1985) Replication and supercoiling of simian virus 40 DNA in cell extracts from human cells. *Molecular and Cellular Biology*, **5**, 2051–2060.
- Stillman, B. (2001) Genomic views of genome duplication. *Science*, **294**, 2301–2304.
- Stillman, B. (2005) Origin recognition and the chromosome cycle. *FEBS Letters*, **579**, 877–884 (review).
- Stinchcomb, D.T., Struhl, K., and Davis, R.W. (1979) Isolation and characterisation of a yeast chromosomal replicator. *Nature*, **282** (5734), 39–43.
- Stinchcomb, D.T., Thomas, M., Kelly, J., Selker, E., and Davis, R.W. (1980) Eukaryotic DNA segments capable of autonomous replication in yeast. *Proceedings of the National Academy of Sciences of the United States of America*, **77**, 4559–4563.
- Stirling, P.C., Bloom, M.S., Solanki-Patil, T. *et al.* (2011) The complete spectrum of yeast chromosome instability genes identifies candidate CIN cancer genes and functional roles for ASTRA complex components. *PLoS Genetics*, **7**, e1002057.
- Stoddard, B. (2006) Homing endonuclease structure and function. *Quarterly Review of Biophysics*, **38**, 49–95.
- Stolovicki, E. and Braun, E. (2011) Collective dynamics of gene expression in cell populations. *PLoS One*, **6**, e20530.
- Strahl, T. and Thorner, J. (2007) Synthesis and function of membrane phosphoinositides in budding yeast, *Saccharomyces cerevisiae*. *Biochimica et Biophysica Acta*, **1771**, 353–404.
- Strahl, B.D., Grant, P.A., Briggs, S.D. *et al.* (2002) Set2 is a nucleosomal histone H3-selective methyltransferase that mediates transcriptional repression. *Molecular and Cellular Biology*, **22**, 1298–1306.
- Straight, A.F., Chou, W., Dowd, G.J. *et al.* (1999) Net1, a Sir2-associated nucleolar protein required for rDNA silencing and nucleolar integrity. *Cell*, **97**, 245–256.
- Strambio-de-Castilla, C., Blobel, G., and Rout, M.P. (1995) Isolation and characterization of nuclear envelopes from the yeast *Saccharomyces*. *J. Cell Biol.*, **131**, 19–31.
- Strambio-de-Castilla, C., Blobel, G., and Rout, M.P. (1995) Isolation and characterization of nuclear envelopes from the yeast *Saccharomyces*. *The Journal of Cell Biology*, **131**, 19–31.
- Strambio-de-Castilla, C., Blobel, G., and Rout, M.P. (1999) Proteins connecting the nuclear pore complex with the nuclear interior. *The Journal of Cell Biology*, **144**, 839–855.
- Strasser, K., Masuda, S., Mason, P. *et al.* (2002) TREX is a conserved complex coupling transcription with messenger RNA export. *Nature*, **417**, 304–308.
- Strathern, J.N. and Herskowitz, I. (1979) Asymmetry and directionality in production of new cell types during clonal growth: the

- switching pattern of homothallic yeast. *Cell*, **17**, 371–381.
- Strathern, J.N., Newlon, C.S., Herskowitz, I., and Hicks, J.B. (1979) Isolation of a circular derivative of yeast chromosome III: implications for the mechanism of mating type interconversion. *Cell*, **18**, 309–319.
- Strathern, J., Hicks, J., and Herskowitz, I. (1981a) Control of cell type in yeast by the mating type locus. The alpha 1–alpha 2 hypothesis. *Journal of Molecular Biology*, **147**, 357–372.
- Strathern, J.N., Jones, E.W., and Broach, J.N. (eds) (1981b) *The Molecular Biology of the Yeast Saccharomyces: Life Cycle and Inheritance*. Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY.
- Strauss, E.J. and Guthrie, C. (1991) A cold-sensitive mRNA splicing mutant is a member of the RNA helicase gene family. *Genes and Development*, **5**, 629–641.
- Streiblova, E. (1988) Cytological methods. In *Yeast - A Practical Approach*, (eds.) I. Campbell and J. H. Duffus, p. 9–49. IRL Press, Oxford and Washington, 1988.
- Strijbis, K. and Distel, B. (2010) Intracellular acetyl unit transport in fungal carbon metabolism. *Eukaryotic Cell*, **9**, 1809–1815.
- Strömhaug, P.E., Reggiori, F., Guan, J., Wang, C.W., and Klionsky, D.J. (2004) Atg21 is a phosphoinositide binding protein required for efficient lipidation and localization of Atg8 during uptake of aminopeptidase I by selective autophagy. *Molecular Biology of the Cell*, **15**, 3553–3566.
- Strom, M., Vollmer, P., Tan, T.J., and Gallwitz, D. (1993) A yeast GTPase-activating protein that interacts specifically with a member of the Ypt/Rab family. *Nature*, **361**, 736–739.
- Struhl, K., Stinchcomb, D.T., Scherer, S., and Davis, R.W. (1979) High-frequency transformation of yeast: autonomous replication of hybrid DNA molecules. *Proceedings of the National Academy of Sciences of the United States of America*, **76**, 1035–1039.
- Struhl, K., Brandl, C.J., Chen, W., Harbury, P.A., Hope, I.A., and Mahadevan, S. (1988) Transcriptional activation by yeast GCN4, a functional homolog to the *jun* oncoprotein. *Cold Spring Harbor Symposia on Quantitative Biology*, **53**, 701–709.
- Struhl, K. (1983) Promoter elements, regulatory elements, and chromatin structure of the yeast *his3* gene. *Cold Spring Harbor Symposia on Quantitative Biology*, **47**, 901–910.
- Struhl, K. (1987a) Promoters, activator proteins, and the mechanism of transcriptional initiation in yeast. *Cell*, **49**, 295–297.
- Struhl, K. (1987b) The DNA-binding domains of the *jun* oncoprotein and the yeast GCN4 transcriptional activator protein are functionally homologous. *Cell*, **50**, 841–846.
- Stuart, J.M., Segal, E., Koller, D., and Kim, S.K. (2003) A gene-coexpression network for global discovery of conserved genetic modules. *Science*, **302**, 249–255.
- Stucka, R. and Feldmann, H. (1994) Cosmid cloning of yeast DNA, in *Molecular Genetics of Yeast: A Practical Approach* (ed. J.R. Johnston), Oxford University Press, New York, pp. 49–64.
- Stucka, R., Lochmuller, H., and Feldmann, H. (1989) Ty4, a novel low-copy number element in *Saccharomyces cerevisiae*: one copy is located in a cluster of Ty elements and tRNA genes. *Nucleic Acids Research*, **17**, 4993–5001.
- Sturtz, L.A., Diekert, K., Jensen, L.T., Lill, R., and Culotta, V.C. (2001) A fraction of yeast Cu,Zn-superoxide dismutase and its metallochaperone, CCS, localize to the intermembrane space of mitochondria. A physiological role for SOD1 in guarding against mitochondrial oxidative damage. *The Journal of Biological Chemistry*, **276**, 38084–38089.
- Stutz, F., Bachi, A., Doerks, T. et al. (2000) REF, an evolutionary conserved family of hnRNP-like proteins, interacts with TAP/Mex67p and participates in mRNA nuclear export. *RNA (New York, NY)*, **6**, 638–650.
- Subramanian, S., Woolford, C.A., Drill, E., Lu, M., and Jones, E.W. (2006) Pbn1p: an essential endoplasmic reticulum membrane protein required for protein processing in the endoplasmic reticulum of budding yeast. *Proceedings of the National Academy of Sciences of the United States of America*, **103**, 939–944.
- Suda, Y., Rodriguez, R.K., Coluccio, A.E., and Neiman, A.M. (2009) A screen for spore wall permeability mutants identifies a secreted protease required for proper spore wall assembly. *PLoS One*, **4**, e7184.
- Sudakin, V., Ganoth, D., Dahan, A. et al. (1995) The cyclosome, a large complex containing cyclin-selective ubiquitin ligase activity, targets cyclins for destruction at the end of mitosis. *Molecular Biology of the Cell*, **6**, 185–198.
- Suganuma, T. and Workman, J.L. (2008) Crosstalk among histone modifications. *Cell*, **135**, 604–607.
- Sugimoto, Y., Sakoh, H., and Yamada, K. (2004) IPC synthase as a useful target for antifungal drugs. *Current Drug Targets Infectious Disorders*, **4**, 311–322.
- Suh, S.O., Marshall, C.J., McHugh, J.V., and Blackwell, M. (2003) Wood ingestion by passalid beetles in the presence of xylose-fermenting gut yeasts. *Molecular Ecology*, **12**, 3137–3145.
- Suka, N., Carmen, A.A., Rundlett, S.E., and Grunstein, M. (1998) The regulation of gene activity by histones and the histone deacetylase RPD3. *Cold Spring Harbor Symposia on Quantitative Biology*, **63**, 391–399 (review).
- Sun, J., Kale, S.P., Childress, A.M., Pinswasdi, C., and Jazwinski, S.M. (1994) Divergent roles of RAS1 and RAS2 in yeast longevity. *The Journal of Biological Chemistry*, **269**, 18638–18645.
- Supek, F., Madden, D.T., Hamamoto, S., Orci, L., and Schekman, R. (2002) Sec16p potentiates the action of COPII proteins to bud transport vesicles. *The Journal of Cell Biology*, **158**, 1029–1038.
- Surana, U., Amon, A., Dowzer, C., McGrew, J., Byers, B., and Nasmyth, K. (1993) Destruction of the CDC28/CLB mitotic kinase is not required for the metaphase to anaphase transition in budding yeast. *The EMBO Journal*, **12**, 1969–1978.
- Sutani, T., Kawaguchi, T., Kanno, R., Itoh, T., and Shirahige, K. (2009) Budding yeast Wpl1 (Rad61)–Pds5 complex counteracts sister chromatid cohesion-establishing reaction. *Current Biology*, **19**, 492–497.
- Sutcliffe, J.G. (1978) pBR322 restriction map derived from the DNA sequence: accurate DNA size markers up to 4361 nucleotide pairs long. *Nucleic Acids Research*, **5**, 2721–2728.
- Suzuki, C.K., Suda, K., Wang, N., and Schatz, G. (1994) Requirement for the yeast gene LON in intramitochondrial proteolysis and maintenance of respiration. *Science*, **264**, 273–276.
- Suzuki, C.K., Rep, M., vanDijl, J.M., Suda, K., Grivell, L.A., and Schatz, G. (1997) ATP-dependent proteases that also chaperone protein biogenesis. *Trends in Biochemical Sciences*, **22**, 118–123 (review).
- Suzuki, K., Kamada, Y., and Ohsumi, Y. (2002) Studies of cargo delivery to the vacuole mediated by autophagosomes in *Saccharomyces cerevisiae*. *Developmental Cell*, **3**, 815–824.
- Suzuki, M., Prasad, G.S., and Kurtzman, C.P. (2011) Debaryomyces Lodder, and Kreger-van Rij (1952) in *The Yeasts: A Taxonomic Study*, vol. 2 (eds C.P. Kurtzman, J. W. Fell, and T. Boekhout), Elsevier, Amsterdam, pp. 361–372.
- Svaerens, S.M., Delvaux, F., Verstrepen, K.J., Van Dijck, P., Thevelein, J.M., and Delvaux, F. R. (2008) Parameters affecting ethyl ester production by *Saccharomyces cerevisiae* during fermentation. *Applied and Environmental Microbiology*, **74**, 454–461.
- Svaren, J. and Hörz, W. (1993) Histones, nucleosomes and transcription. *Current Opinion in Genetics & Development*, **3**, 219–225 (review).
- Svaren, J. and Hörz, W. (1995) Interplay between nucleosomes and transcription factors at the yeast PHO5 promoter. *Seminars in Cell Biology*, **6**, 177–183 (review).
- Svaren, J. and Hörz, W. (1996) Regulation of gene expression by nucleosomes. *Current Opinion in Genetics & Development*, **6**, 164–170 (review).
- Svaren, J. and Hörz, W. (1997) Transcription factors vs nucleosomes: regulation of the PHO5 promoter in yeast. *Trends in Biochemical Sciences*, **22**, 93–97 (review).
- Svejstrup, J.Q., Li, Y., Fellows, J., Gnat, A., Bjorklund, S., and Kornberg, R.D. (1997) Evidence for a mediator cycle at the initiation of transcription. *Proceedings of the National Academy of Sciences of the United States of America*, **94**, 6075–6078.
- Swanson, R.N., Conesa, C., Lefebvre, O. et al. (1991) Isolation of *TFC1*, a gene encoding one of two DNA-binding subunits of yeast transcription factor tau (TFIIIC). *Proceedings of the National Academy of Sciences of the United States of America*, **88**, 4887–4891.
- Swanson, R., Locher, M., and Hochstrasser, M. (2001) A conserved ubiquitin ligase of the nuclear envelope/endoplasmic reticulum that functions in both ER-associated and Matalpha2 repressor degradation. *Genes and Development*, **15**, 2660–2674.
- Sweder, K. and Madura, K. (2002) Regulation of repair by the 26S proteasome. *Journal of Biomedicine & Biotechnology*, **2**, 94–105.
- Sweetser, D., Nonet, M., and Young, R.A. (1987) Prokaryotic and eukaryotic RNA polymerases have homologous core subunits. *Proceedings of the National Academy of Sciences of the United States of America*, **84**, 1192–1196.

- Swennen, D. and Beckerich, J.M. (2007) *Yarrowia lipolytica* vesicle-mediated protein transport pathways. *BMC Evolutionary Biology*, **7**, 219.
- Szczebara, F.M., Chandelier, C., Villeret, C. *et al.* (2003) Total biosynthesis of hydrocortisone from a simple carbon source in yeast. *Nature Biotechnology*, **21**, 143–149.
- Szczypka, M.S., Wemmie, J.A., Moye-Rowley, W. S., and Thiele, D.J. (1994) A yeast metal resistance protein similar to human cystic fibrosis transmembrane conductance regulator (CFTR) and multidrug resistance-associated protein. *The Journal of Biological Chemistry*, **269**, 22853–22857.
- Szostak, J.W. and Blackburn, E.H. (1982) Cloning yeast telomeres in linear plasmid vectors. *Cell*, **29**, 245–255.
- Szul, T., Garcia-Mata, R., Brandon, E., Shestopal, S., Alvarez, C., and Sztul, E. (2005) Dissection of membrane dynamics of the ARF-guanine nucleotide exchange factor GBF1. *Traffic*, **6**, 374–385.
- Szul, T., Grabski, R., Lyons, S., Morohashi, Y., Shestopal, S., Lowe, M., Sztul, E. (2007) Dissecting the role of the ARF guanine nucleotide exchange factor GBF1 in Golgi biogenesis and protein trafficking. *Journal of Cell Science*, **120**, 3929–3940.
- Szyrach, G., Ott, M., Bonnefoy, N., Neupert, W., and Herrmann, J.M. (2003) Ribosome binding to the Oxa1 complex facilitates co-translational protein insertion in mitochondria. *The EMBO Journal*, **22**, 6448–6457.
- Tabak, H.F., Braakman, I., and Distel, B. (1999) Peroxisomes: simple in function but complex in maintenance. *Trends in Cell Biology*, **9**, 447–453 (review).
- Taddei, A. and Gasser, S.M. (2004) Multiple pathways for telomere tethering: functional implications of subnuclear position for heterochromatin formation. *Biochimica et Biophysica Acta*, **1677**, 120–128 (review).
- Taggart, A.K. and Zakian, V.A. (2003) Telomerase: what are the EST proteins doing? *Current Opinion in Cell Biology*, **15**, 275–280.
- Taggart, A.K.P., Teng, S.C., and Zakian, V.A. (2002) Est1p as a cell cycle-regulated activator of telomere-bound telomerase. *Science*, **297**, 1023–1026.
- Taglicht, D. and Michaelis, S. (1998) *Saccharomyces cerevisiae* ABC proteins and their relevance to human health and disease. *Methods in Enzymology*, **292**, 130–162.
- Takahashi, Y., Toh-e, A., and Kikuchi, Y. (2001) Yeast Ull1/Siz1 is a novel SUMO1/Smt3 ligase for septin components and functions as an adaptor between conjugating enzyme and substrates. *Genetics*, **275**, 223–231.
- Takai, H., Xie, Y., de Lange, T., and Pavletich, N. P. (2010) Tel2 structure and function in the Hsp90-dependent maturation of mTOR and ATR complexes. *Genes and Development*, **24**, 2019–2030.
- Takano, I. and Oshima, Y. (1970) Mutational nature of an allele-conversion of the mating type alpha by the homothallic gene HO in *Saccharomyces Genetics*, **65**, 421–427.
- Takayama, Y., Kamimura, Y., Okawa, M., Muramatsu, S., Sugino, A., and Araki, H. (2003) GINS, a novel multiprotein complex required for chromosomal DNA replication in budding yeast. *Genes and Development*, **17**, 1153–1165.
- Takegawa, K., Iwaki, T., Fujita, Y., Morita, T., Hosomi, A., and Tanaka, N. (2003) Vesicle-mediated protein transport pathways to the vacuole in *Schizosaccharomyces pombe*. *Cell Structure and Function*, **28**, 399–417.
- Takeuchi, M., Kimata, Y., and Kohno, K. (2008) *Saccharomyces cerevisiae* Rot1 Is an essential molecular chaperone in the endoplasmic reticulum. *Molecular Biology of the Cell*, **19**, 3514–3525.
- Takizawa, P.A., Sil, A., Swedlow, J.R., Herskowitz, I., and Vale, R.D. (1997) Actin-dependent localization of an RNA encoding a cell-fate determinant in yeast. *Nature*, **389**, 90–93.
- Takizawa, P.A., DeRisi, J.L., Wilhelm, J.E., and Vale, R.D. (2000) Plasma membrane compartmentalization in yeast by messenger RNA transport and a septin diffusion barrier. *Science*, **290**, 341–344.
- Tamanai, F. and Stillman, B.W. (1983) Initiation of adenovirus DNA replication *in vitro* requires a specific DNA sequence. *Proceedings of the National Academy of Sciences of the United States of America*, **80**, 6446–6450.
- Tamura, T., Shimbara, N., Aki, M. *et al.* (1992) Molecular cloning of cDNAs for rat proteasomes: deduced primary structures of four other subunits. *Journal of Biochemistry*, **112**, 530–534.
- Tamura, S., Shimozawa, N., Suzuki, Y., Tsukamoto, T., Osumi, T., and Fujiki, Y. (1998) A cytoplasmic AAA family peroxin, Pex1p, interacts with Pex6p. *Biochemical and Biophysical Research Communications*, **245**, 883–886.
- Tan, T.J., Vollmer, P., and Gallwitz, D. (1991) Identification and partial purification of GTPase-activating proteins from yeast and mammalian cells that preferentially act on Ypt1/Rab1 proteins. *FEBS Letters*, **291**, 322–326.
- Tan, A.L.C., Rida, P.G.C., and Surana, U. (2005) Essential tension and constructive destruction: the spindle checkpoint and its regulatory links with mitotic exit. *The Biochemical Journal*, **386**, 1–13 (review).
- Tanaka, K., Suzuki, T., and Chiba, T. (1998) The ligation systems for ubiquitin and ubiquitin-like proteins. *Molecular Cell*, **8**, 503–512.
- Tanaka, S., Umemori, T., Hirai, K., Muramatsu, S., Kamimura, Y., and Araki, H. (2007) CDK-dependent phosphorylation of Sld2 and Sld3 initiates DNA replication in budding yeast. *Nature*, **445**, 328–332.
- Tanay, A., Regev, A., and Shamir, R. (2005) Conservation and evolvability in regulatory networks, the evolution of ribosomal regulation in yeast. *Proceedings of the National Academy of Sciences of the United States of America*, **102**, 7203–7208.
- Tang, D.T., Glazov, E.A., McWilliam, S.M., Barris, W.C., and Dalrymple, B.P. (2009) Analysis of the complement and molecular evolution of tRNA genes in cow. *BMC Genomics*, **10**, 188.
- Tanghe, A., Van Dijk, P., Colavizza, D., and Thevelein, J.M. (2004) Aquaporin-mediated improvement of freeze tolerance of *Saccharomyces cerevisiae* is restricted to rapid freezing conditions. *Applied and Environmental Microbiology*, **70**, 3377–3382.
- Tanida, I., Mizushima, N., Kiyooka, M. *et al.* (1999) Apg7p/Cvt2p: a novel protein-activating enzyme essential for autophagy. *Molecular Biology of the Cell*, **10**, 1367–1379.
- Tarassov, I., Entelis, N., and Martin, R.P. (1995) Mitochondrial import of a cytoplasmic lysine-tRNA in yeast is mediated by cooperation of cytoplasmic and mitochondrial lysyl-tRNA synthetases. *The EMBO Journal*, **14**, 3461–3471.
- Tarassov, K., Messier, V., Landry, C.R. *et al.* (2008) An *in vivo* map of the yeast protein interactome. *Science*, **320**, 1465–1470.
- Targonski, Z. (1992) Biotransformation of lignin-related aromatic-compounds by *Pichia stipitis* pignal. *Zentralblatt Fur Mikrobiologie*, **147**, 244–249.
- Tarn, W.Y. and Chang, T.H. (2009) The current understanding of Ded1p/DDX3 homologs from yeast to human. *RNA Biology*, **6**, 17–20.
- Tartof, K.D. (1994) Position effect variegation in yeast. *Bioessays*, **16**, 713–714 (review).
- Tashima, Y., Taguchi, R., Murata, C., Ashida, H., Kinoshita, T., and Maeda, Y. (2006) PGAP2 is essential for correct processing and stable expression of GPI-anchored proteins. *Molecular Biology of the Cell*, **17**, 1410–1420.
- Tatsuta, T., Model, K., and Langer, T. (2005) Formation of membrane-bound ring complexes by prohibitins in mitochondria. *Molecular Biology of the Cell*, **16**, 248–259.
- Tatsuta, T., Augustin, S., Nolden, M., Friedrichs, B., and Langer, T. (2007) m-AAA protease-driven membrane dislocation allows intramembrane cleavage by rhomboid in mitochondria. *The EMBO Journal*, **26**, 325–335.
- Tauer, R., Mannhaupt, G., Schnell, R., Pajic, A., Langer, T., and Feldmann, H. (1994) Yta10p, a member of a novel ATPase family in yeast, is essential for mitochondrial function. *FEBS Letters*, **353**, 197–200.
- Tautz, D. and Domazet-Lošo, T. (2011) The evolutionary origin of orphan genes. *Nature Reviews Genetics*, **12**, 692–702.
- Taylor, J.W. and Berbee, M.L. (2006) Dating divergence in the fungal tree of life, review and new analyses. *Mycologia*, **98**, 838–849.
- Taylor, D.J. and Bruenn, J. (2009) The evolution of novel fungal genes from non-retroviral RNA viruses. *BMC Biology*, **7**, 88.
- Taylor, N.J. and Fauquet, C.M. (2002) Microparticle bombardment as a tool in plant science and agricultural biotechnology. *DNA and Cell Biology*, **21**, 963–977.
- Tenreiro, S. and Outeiro, T.F. (2010) Simple is good: yeast models of neurodegeneration. *FEMS Yeast Research*, **10**, 970–979 (review).
- Teo, H., Perisic, O., Gonzalez, B., and Williams, R.L. (2004) ESCRT-II, an endosome-associated complex required for protein sorting: crystal structure and interactions with ESCRT-III and membranes. *Developmental Cell*, **7**, 559–569.
- Teo, H., Gill, D.J., Sun, J. *et al.* (2006) ESCRT-I core and ESCRT-II GLUE domain structures reveal role for GLUE in linking to ESCRT-I and membranes. *Cell*, **125**, 99–111.
- Terlecky, S.R., Koepke, J.I., and Walton, P.A. (2006) Peroxisomes and aging. *Biochimica et Biophysica Acta*, **1763**, 1749–1754.
- Thakur, H.K., Arthanari, H., Yang, F. *et al.* (2008) A nuclear receptor-like pathway

- regulating multidrug resistance in fungi. *Nature*, **452**, 604–609.
- Tham, W.H. and Zakian, V.A. (2002) Transcriptional silencing at *Saccharomyces* telomeres: implications for other organisms. *Oncogene*, **21**, 512–521 (review).
- Thanabalu, T. and Munn, A.L. (2001) Functions of Vrp1p in cytokinesis and actin patches are distinct and neither requires a WH2/V domain. *The EMBO Journal*, **20**, 6979–6989.
- The Gene Ontology Consortium (2000) Gene Ontology: tool for the unification of biology. *Nature Genetics*, **25**, 25–29.
- The Gene Ontology Consortium (2008) The Gene Ontology project in 2008. *Nucleic Acids Research*, **36** (Database Issue), D440–D444.
- Theriot, J.A. (1997) Accelerating on a treadmill: ADF/cofilin promotes rapid actin filament turnover in the dynamic cytoskeleton. *The Journal of Cell Biology*, **136**, 1165–1168.
- Thierry, A., Gaillon, L., Galibert, F., and Dujon, B. (1995) Construction of a complete genomic library of *Saccharomyces cerevisiae* and physical mapping of chromosome XI at 3.7kb resolution. *Yeast (Chichester, England)*, **11**, 121–135.
- Thierry, A., Bouchier, C., Dujon, B., and Richard, G.F. (2008) Megasatellites, a peculiar class of giant minisatellites in genes involved in cell adhesion and pathogenicity in *Candida glabrata*. *Nucleic Acids Research*, **36**, 5970–5982.
- Thierry, A., Dujon, B. and Richard, G.F. (2009) Megasatellites: a new class of large tandem repeats discovered in the pathogenic yeast *Candida glabrata*. *Cellular and Molecular Life Sciences*, **67**, 671–676.
- Thim, L., Hansen, M.T., Norris, K. et al. (1986) Secretion and processing of insulin precursors in yeast. *Proceedings of the National Academy of Sciences of the United States of America*, **83**, 6766–6770.
- Thim, L., Hansen, M.T., and Sørensen, A.R. (1987) Secretion of human insulin by a transformed yeast cell. *FEBS Letters*, **212**, 307–312.
- Thiry, M. and Lafontaine, D.L. (2005) Birth of a nucleolus: the evolution of nucleolar compartments. *Trends in Cell Biology*, **15**, 194–199.
- Thompson, D.M. and Parker, R. (2009) The RNase Rny1p cleaves tRNAs and promotes cell death during oxidative stress in *Saccharomyces cerevisiae*. *The Journal of Cell Biology*, **185**, 43–50.
- Thompson, C.M. and Young, R.A. (1995) General requirement for RNA polymerase II holoenzymes *in vivo*. *Proceedings of the National Academy of Sciences of the United States of America*, **92**, 4587–4590.
- Thompson, C.M., Koleske, A.J., Chao, D.M., and Young, R.A. (1993a) A multisubunit complex associated with the RNA polymerase II CTD and TATA-binding protein in yeast. *Cell*, **73**, 1361–1375.
- Thompson, J.S., Hecht, A., and Grunstein, M. (1993b) Histones and the regulation of heterochromatin in yeast. *Cold Spring Harbor Symposia on Quantitative Biology*, **58**, 247–256.
- Thompson, M., Haeusler, R.A., Good, P.D., and Engelke, D.R. (2003) Nucleolar clustering of dispersed tRNA genes. *Science*, **302**, 1399–1401.
- Thumm, M., Egner, R., Koch, B. et al. (1994) Isolation of autophagocytosis mutants of *Saccharomyces cerevisiae*. *FEBS Letters*, **349**, 275–280.
- Thuret, J.Y., Valay, J.G., Faye, G., and Mann, C. (1996) Civ1 (CAK *in vivo*), a novel Cdk-activating kinase. *Cell*, **86**, 565–576.
- Thuriaux, P., Mann, C., Buhler, J.M. et al. (1986) Gene cloning and mutant isolation of subunits of RNA polymerases in the yeast *Saccharomyces cerevisiae*. *Basic Life Sciences*, **40**, 519–531.
- Tilghman, S.M., Tiemeier, D.C., Seidman, J.G. et al. (1978) Intervening sequence of DNA identified in the structural portion of a mouse beta-globin gene. *Proceedings of the National Academy of Sciences of the United States of America*, **75**, 725–729.
- Timmers, H.T., and Tora, L. (2005) SAGA unveiled. *Trends in Biochemical Sciences*, **30**, 7–10 (review).
- Tiollais, P., Perricaudet, M., Pettersson, U., and Philipson, L. (1976) Propagation in *E. coli* of bacteriophage lambda with integrated fragments of adenovirus 2 DNA. *Genetics*, **1**, 49–63.
- Tirosch, I. and Barkai, N. (2008) Evolution of gene sequence and gene expression are not correlated in yeast. *Trends in Genetics*, **24**, 109–113.
- Tirosch, Y., Bilu, N., and Barkai, N. (2007) Comparative biology: beyond sequence analysis. *Current Opinion in Biotechnology*, **18**, 371–377.
- Tirosch, I., Sigal, N., and Barkai, N. (2010) Divergence of nucleosome positioning between two closely related yeast species: genetic basis and functional consequences. *Molecular Systems Biology*, **6**, 365.
- Tirosh, I. and Barkai, N. (2008) Two strategies for gene regulation by promoter nucleosomes. *Genome Research*, **18**, 1064–1091.
- Tirosh, I., Weinberger, A., Bezalel, D., Kaganovich, M., and Barkai, N. (2008) On the relation between promoter divergence and gene expression evolution. *Molecular Systems Biology*, **4**, 159.
- Tirosh, I., Barkai, N., and Verstrepen, K.J. (2009) Promoter architecture and the evolvability of gene expression. *Journal of Biology*, **8**, 95.
- Tirosh, I., Reikhav, S., Sigal, N., Assia, Y., and Barkai, N. (2010) Chromatin regulators as capacitors of interspecies variations in gene expression. *Molecular Systems Biology*, **6**, e435.
- Titorenko, V.I. and Rachubinski, R.A. (2001) Dynamics of peroxisome assembly and function. *Trends in Cell Biology*, **11**, 22–29.
- Titorenko, V.I., Ogrzydziak, D.M., and Rachubinski, R.A. (1997) Four distinct secretory pathways serve protein secretion, cell surface growth, and peroxisome biogenesis in the yeast *Yarrowia lipolytica*. *Molecular and Cellular Biology*, **17**, 5210–5226.
- Toh-e, A. and Utatsu, I. (1985) Physical and functional structure of a yeast plasmid, pSB3, isolated from *Zygosaccharomyces bisporus*. *Nucleic Acids Research*, **13**, 4267–4283.
- Toh-e, A., Tada, S., and Oshima, Y. (1982) 2-micrometers DNA-like plasmids in the osmophilic haploid yeast *Saccharomyces rouxii*. *Journal of Bacteriology*, **151**, 1380–1390.
- Tokatlidis, K., Junne, T., Moes, S., Schatz, G., Glick, B.S., and Kronidou, N. (1996) Translocation arrest of an intramitochondrial sorting signal next to Tim11 at the inner-membrane import site. *Nature*, **384**, 585–588.
- Toledano, M.B., Delaunay, A., Monceau, L., and Tacnet, F. (2004) Microbial H₂O₂ sensors as archetypal redox signaling modules. *Trends in Biochemical Sciences*, **29**, 351–357 (review).
- Tolliday, N., Bouquin, N., and Li, R. (2001) Assembly and regulation of the cytokinetic apparatus in budding yeast. *Curr Opin Microbiol.*, **4**, 690–695.
- Tolliday, N., Bouquin, N., and Li, R. (2001) Assembly and regulation of the cytokinetic apparatus in budding yeast. *Current Opinion in Microbiology*, **4**, 690–695.
- Tomoyasu, T., Yamanaka, K., Murata, K. et al. (1993) Topology and subcellular localization of FtsH protein in *Escherichia coli*. *Journal of Bacteriology*, **175**, 1344–1351.
- Ton, V.-K. and Rao, R. (2004) Functional expression of heterologous proteins in yeast: insights into Ca-signalling and Ca-transporting ATPases. *American Journal of Physiology Cell Physiology*, **287**, C580–C589.
- Tong, A.H., Lesage, G., Bader, G.D. et al. (2004) Global mapping of the yeast genetic interaction network. *Science*, **303**, 808–813.
- Toogun, O.A., Zeiger, W., and Freeman, B.C. (2007) The p23 molecular chaperone promotes functional telomerase complexes through DNA dissociation. *Proceedings of the National Academy of Sciences of the United States of America*, **104**, 5765–5770.
- Toone, W.M. and Jones, N. (1999) AP-1 transcription factors in yeast. *Current Opinion in Genetics & Development*, **9**, 55–61 (review).
- Toone, W.M., Kuge, S., Samuels, M., Morgan, B. A., Toda, T., and Jones, N. (1998) Regulation of the fission yeast transcription factor Pap1 by oxidative stress: requirement for the nuclear export factors Crm1 (Exportin) and the stress-activated MAP kinase, Sty1. *Genes and Development*, **12**, 1453–1463.
- Torok, M.S. and Grant, P.A. (2004) Histone acetyltransferase proteins contribute to transcriptional processes at multiple levels. *Advances in Protein Chemistry*, **67**, 181–199 (review).
- Torreira, E., Jha, S., Lopez-Blanco, J.R. et al. (2008) Architecture of the pontin/reptin complex, essential in the assembly of several macromolecular complexes. *Structure (London, England: 1993)*, **16**, 1511–1520.
- Torres, E.M., Dephoure, N., Panneerselvam, A. et al. (2010) Identification of aneuploidy-tolerating mutations. *Cell*, **143**, 71–83.
- Torres-Rosell, J., Machin, F., and Aragon, L. (2005) Smc5–Smc6 complex preserves nucleolar integrity in *S. cerevisiae*. *Cell Cycle (Georgetown, Tex.)*, **4**, 868–872.
- Toth, A., Ciosk, R., Uhlmann, F., Galova, M., Schleiffer, A., and Nasmyth, K. (1999) Yeast cohesin complex requires a conserved protein, Eco1p(Ctf7), to establish cohesion between sister chromatids during DNA replication. *Genes and Development*, **13**, 320–333.
- Townsley, F.M. and Pelham, H.R. (1994) The KKXX signal mediates retrieval of membrane proteins from the Golgi to the ER in yeast. *European Journal of Cell Biology*, **64**, 211–216.

- Townsley, F.M., Frigerio, G., and Pelham, H.R. (1994) Retrieval of HDEL proteins is required for growth of yeast cells. *The Journal of Cell Biology*, **127**, 21–28.
- Trantas, E., Panopoulos, N., and Ververidis, F. (2009) Metabolic engineering of the complete pathway leading to heterologous biosynthesis of various flavonoids and stilbenoids in *Saccharomyces cerevisiae*. *Metabolic Engineering*, **11**, 355–366.
- Traven, A., Jelicic, B., and Sopta, M. (2006) Yeast Gal4: a transcriptional paradigm revisited. *EMBO Reports*, **7**, 496–499.
- Travers, A.A. (1992) The reprogramming of transcriptional competence. *Cell*, **69**, 573–575 (review).
- Treich, I., Carles, C., Riva, M., and Sentenac, A. (1992) *RPC10* encodes a new mini subunit shared by yeast nuclear RNA polymerases. *Gene Expression*, **2**, 31–37.
- Treitel, M.A. and Carlson, M. (1995) Repression by Ssn6–Tup1 is directed by Mig1, a repressor/activator protein. *Proceedings of the National Academy of Sciences of the United States of America*, **92**, 3132–3136.
- Triebel, R.C. (2004) Structure and function of histone methyltransferases. *Critical Reviews in Eukaryotic Gene Expression*, **14**, 147–169.
- Trotta, C.R., Miao, F., Arn, E.A. et al. (1997) The yeast tRNA splicing endonuclease: a tetrameric enzyme with two active site subunits homologous to the archaeal tRNA endonucleases. *Cell*, **89**, 849–858.
- Trotter, E.W., Rand, J.D., Vickerstaff, J., and Grant, C.M. (2008) The yeast Tsa1 peroxiredoxin is a ribosome-associated antioxidant. *The Biochemical Journal*, **412**, 73–80.
- Trotter, P.J. (2001) The genetics of fatty acid metabolism in *Saccharomyces cerevisiae*. *Annual Review of Nutrition*, **21**, 9711–9719.
- True, H.L. and Lindquist, S.L. (2000) A yeast prion provides a mechanism for genetic variation and phenotypic diversity. *Nature*, **407**, 477–483.
- True, H.L., Berlin, I., and Lindquist, S.L. (2004) Epigenetic regulation of translation reveals hidden genetic variation to produce complex traits. *Nature*, **431**, 184–187.
- Truscott, K.N., Voos, W., Frazier, A.E. et al. (2003) A J-protein is an essential subunit of the presequence translocase-associated protein import motor of mitochondria. *The Journal of Cell Biology*, **163**, 707–713.
- Tsai, I.J., Bensasson, D., Burt, A., and Koufopanou, V. (2008) Population genomics of the wild yeast *Saccharomyces paradoxus*: quantifying the life cycle. *Proceedings of the National Academy of Sciences of the United States of America*, **105**, 4957–4962.
- Tsang, C.K. and Zheng, X.F.S. (2007) TOR-in(g) the nucleus. *Cell Cycle (Georgetown, Tex.)*, **6**, 25–29.
- Tsankov, A.M., Thompson, D.A., Socha, A., Regev, A., and Rando, O.J. (2010) The role of nucleosome positioning in the evolution of gene regulation. *PLoS Biology*, **8**, e1000414.
- Tsien, R.Y. (2008) Constructing and exploiting the fluorescent protein paintbox. Nobel Lecture, December 8, 2008.
- Tsien, R.Y. (2008) *Constructing and exploiting the fluorescent protein paintbox*. Nobel Lecture, December 8, 2008.
- Tsolou, A. and Lydall, D. (2007) Mrc1 protects uncapped budding yeast telomeres from exonuclease EXO1. *DNA Repair*, **6**, 1607–1617.
- Tsong, A.E., Tuch, B.B., Li, H., and Johnson, A.D. (2006) Evolution of alternative transcriptional circuits with identical logic. *Nature*, **443**, 415–420.
- Tsui, C.K.M., Daniel, H.M., Robert, V., and Meyer, W. (2008) Re-examining the phylogeny of clinically relevant *Candida* species and allied genera based on multigene analysis. *FEMS Yeast Research*, **8**, 651–659.
- Tsukada, M. and Ohsumi, Y. (1993) Isolation and characterization of autophagy-defective mutants of *Saccharomyces cerevisiae*. *FEBS Letters*, **333**, 169–174.
- Tsukiyama, T. (2002) *The in vivo* functions of ATP-dependent chromatin-remodelling factors. *Nature Reviews Molecular Cell Biology*, **3**, 422–429 (review).
- Tsurimoto, T. and Stillman, B. (1989) Multiple replication factors augment DNA synthesis by the two eukaryotic DNA polymerases, alpha and delta. *The EMBO Journal*, **8**, 3883–3889.
- Tsvetanova, N.G., Klass, D.M., Salzman, J., and Brown, P.O. (2010) Proteome-wide search reveals unexpected RNA-binding proteins in *Saccharomyces cerevisiae*. *PLoS One*, **5**, e12671.
- Tóth, A., Rabitsch, K.P., Gálová, M., Schleiffer, A., Buonomo, S.B., and Nasmyth, K. (2000) Functional genomics identifies monopolin: a kinetochore protein required for segregation of homologs during meiosis I. *Cell*, **103**, 1155–1168.
- Tu, J. and Carlson, M. (1995) REG1 binds to protein phosphatase type I and regulates glucose repression in yeast. *The EMBO Journal*, **14**, 5939–5946.
- Tu, B.P. and McKnight, S.L. (2006) Metabolic cycles as an underlying basis of biological oscillations. *Nature Reviews Molecular Cell Biology*, **7**, 696–701.
- Tu, B.P., Kudlicki, A., Rowicka, M., and McKnight, S.L. (2005) Logic of the yeast metabolic cycle: temporal compartmentalization of cellular processes. *Science*, **310**, 1152–1158.
- Tuch, B.B., Galgoczy, D.J., Hernday, A.D., Li, H., and Johnson, A.D. (2008) The evolution of combinatorial gene regulation in fungi. *PLoS Biology*, **6**, e38.
- Tucker, C.L. and Fields, S. (2003) Lethal combinations. *Nature Genetics*, **35**, 204–205.
- Tucker, M., Staples, R.R., Valencia-Sanchez, M.A., Muhrad, D., and Parker, R. (2002) Ccr4p is the catalytic subunit of a Ccr4p/Pop2p/Notp mRNA deadenylase complex in *Saccharomyces cerevisiae*. *The EMBO Journal*, **21**, 1427–1436.
- Tugendreich, S., Perkins, E., Couto, J. et al. (2001) A streamlined process to phenotypically profile heterologous cDNAs in parallel using yeast cell-based assays. *Genome Research*, **11**, 1899–1912.
- Tuite, M.F. and Lindquist, S.L. (1996) Maintenance and inheritance of yeast prions. *Trends in Genetics*, **12**, 467–471.
- Turk, M., Montiel, V., Zigon, D., Plemenitas, A., and Ramos, J. (2007) Plasma membrane composition of *Debaryomyces hansenii* adapts to changes in pH and external salinity. *Microbiology (Reading, England)*, **153**, 3586–3592.
- Turunen, O., Seelke, R., and Macosko, J. (2009) *In silico* evidence for functional specialization after genome duplication in yeast. *FEMS Yeast Research*, **9**, 16–31.
- Tuteja, N. and Tuteja, R. (2004) Unraveling DNA helicases: motif, structure, mechanism and function. *European Journal of Biochemistry*, **271**, 1849–1863.
- Tzagoloff, A. and Akai, A. (1972) Assembly of the mitochondrial membrane system. 8. Properties of the products of mitochondrial protein synthesis in yeast. *The Journal of Biological Chemistry*, **247**, 6517–6523.
- Tzagoloff, A. and Dieckmann, C.L. (1990) PET genes of *Saccharomyces cerevisiae*. *Microbiological Reviews*, **54**, 211–225 (review).
- Tzagoloff, A., Rubin, M.S., and Sierra, M.F. (1973) Biosynthesis of mitochondrial enzymes. *Biochimica et Biophysica Acta*, **301**, 71–104 (review).
- Tzagoloff, A., Akai, A., and Needleman, R.B. (1975) Assembly of the mitochondrial membrane system: isolation of nuclear and cytoplasmic mutants of *Saccharomyces cerevisiae* with specific defects in mitochondrial functions. *Journal of Bacteriology*, **122**, 826–831.
- Tzagoloff, A., Macino, G., and Sebald, W. (1979) Mitochondrial genes and translation products. *Annual Review of Biochemistry*, **48**, 419–441 (review).
- Tzagoloff, A., Gatti, D., and Gampel, A. (1990) Mitochondrial aminoacyl-tRNA synthetases. *Progress in Nucleic Acid Research and Molecular Biology*, **39**, 129–158 (review).
- Tzagoloff, A., Yue, J., Jang, J., and Paul, M.F. (1994) A new member of a family of ATPases is essential for assembly of mitochondrial respiratory chain and ATP synthetase complexes in *Saccharomyces cerevisiae*. *The Journal of Biological Chemistry*, **269**, 26144–26151.
- Tzagoloff, A. (1972) A model of membrane biogenesis. *Journal of Bioenergetics*, **3**, 39–45.
- Tzamaras, D. and Struhl, K. (1995) Distinct TPR motifs of Cyc8 are involved in recruiting the Cyc8–Tup1 corepressor complex to differentially regulated promoters. *Genes and Development*, **9**, 821–831.
- Ubersax, J.A., Woodbury, E.L., Quang, P.N. et al. (2003) Targets of the cyclin-dependent kinase Cdk1. *Nature*, **425**, 859–864.
- Ubukata, T., Shimizu, T., Adachi, N., Sekimizu, K., and Nakanishi, T. (2003) Cleavage, but not read-through, stimulation activity is responsible for three biologic functions of transcription elongation factor S-II. *The Journal of Biological Chemistry*, **278**, 8580–8585.
- Udagama, M., Sabri, A., and Bartholomew, B. (2011) The INO80 ATP-dependent chromatin remodeling complex is a nucleosome spacing factor. *Molecular and Cellular Biology*, **31**, 662–673.
- Ueda, M. and Tanaka, A. (2000) Cell-surface engineering of yeast: construction of arming yeast with biocatalyst. *Journal of Bioscience and Bioengineering*, **90**, 125–136.
- Uetz, P., Giot, L., Cagney, G. et al. (2000) A comprehensive analysis of protein–protein interactions in *Saccharomyces cerevisiae*. *Nature*, **403**, 623–627.

- Uhlmann, F., Lottspeich, F., and Nasmyth, K. (1999) Sister-chromatid separation at anaphase onset is promoted by cleavage of the cohesin subunit Scc1. *Nature*, **400**, 37–42.
- Uhlmann, F., Wernic, D., Poupard, M.A., Koonin, E.V., and Nasmyth, K. (2000) Cleavage of cohesin by the CD clan protease separin triggers anaphase in yeast. *Cell*, **103**, 375–386.
- Ukibe, K., Hashida, K., Yoshida, N., and Takagi, H. (2009) Metabolic engineering of *Saccharomyces cerevisiae* for astaxanthin production and oxidative stress tolerance. *Applied and Environmental Microbiology*, **75**, 7205–7211.
- Ulrich, H.D. and Jentsch, S. (2000) Two RING finger proteins mediate cooperation between ubiquitin-conjugating enzymes in DNA repair. *The EMBO Journal*, **19**, 3388–3397.
- Ulrich, H.D. (2003) Protein–protein interactions within an E2-RING finger complex. Implications for ubiquitin-dependent DNA damage repair. *The Journal of Biological Chemistry*, **278**, 7051–7058.
- Ulrich, H.D. (2009) Regulating post-translational modifications of the eukaryotic replication clamp PCNA. *DNA Repair*, **8**, 461–469.
- Umemura, M., Okamoto, M., Nakayama, K. et al. (2003) GWT1 gene is required for inositol acylation of glycosylphosphatidylinositol anchors in yeast. *The Journal of Biological Chemistry*, **278**, 23639–23647.
- Umen, J.G., Guthrie, C. (1995b) The second catalytic step of pre-mRNA splicing. *RNA*, **1**, 869–885. Review.
- Ungar, L., Yosef, N., Sela, Y. et al. (2009) A genome-wide screen for essential yeast genes that affect telomere length maintenance. *Nucleic Acids Research*, **37**, 3840–3849.
- Uptain, S.M. and Lindquist, S.L. (2002) Prions as protein-based genetic elements. *Annual Review of Microbiology*, **56**, 703–741.
- Urban, J., Soulard, A., Huber, A. et al. (2007) Sch9 is a major target of TORC1 in *Saccharomyces cerevisiae*. *Molecular Cell*, **26**, 663–674.
- Urbanelli, L., Magini, A., Polchi, A., Polidoro, M., and Emiliani, C. (2011) Recent developments in therapeutic approaches for lysosomal storage diseases. *Recent Patents on CNS Drug Discovery*, **6**, 1–19 (review).
- Urbanowski, J.L. and Piper, R.C. (2001) Ubiquitin sorts proteins into the intraluminal degradative compartment of the late-endosome/vacuole. *Traffic (Copenhagen, Denmark)*, **2**, 622–630.
- Urech, D.M., Lichtlen, P., and Barberis, A. (2003) Cell growth selection system to detect extracellular and transmembrane protein interactions. *Biochimica et Biophysica Acta*, **1622**, 117–127.
- Uringa, E.J., Youds, J.L., Lisingo, K., Lansdorp, P.M., and Boulton, S.J. (2011) RTEL1: an essential helicase for telomere maintenance and the regulation of homologous recombination. *Nucleic Acids Research*, **39**, 1647–1655.
- Usher, J. and Bond, U. (2009) Recombination between homoeologous chromosomes of lager yeasts leads to loss of function of the hybrid *GPH1* gene. *Applied and Environmental Microbiology*, **75**, 4573–4579.
- Utley, R.T. and Cote, J. (2003) The MYST family of histone acetyltransferases. *Current Topics in Microbiology and Immunology*, **274**, 203–236 (review).
- Utley, R.T., Lacoste, N., Jobin-Robitaille, O., Allard, S., and Cote, J. (2005) Regulation of NuA4 histone acetyltransferase activity in transcription and DNA repair by phosphorylation of histone H4. *Molecular and Cellular Biology*, **25**, 8179–8190.
- Valach, M., Farkas, Z., Fricova, D. et al. (2011) Evolution of linear chromosomes and multipartite genomes in yeast mitochondria. *Nucleic Acids Research*, **39**, 4202–4219.
- Valdivia, R.H., Baggott, D., Chuang, J.S., and Schekman, R.W. (2002) The yeast clathrin adaptor protein complex 1 is required for the efficient retention of a subset of late Golgi membrane proteins. *Developmental Cell*, **2**, 283–294.
- Valenzuela, P., Bell, G.L., Masiarz, F.R., DeGennaro, L.J., and Rutter, W.J. (1977) Nucleotide sequence of the yeast 5S ribosomal RNA gene and adjacent putative control regions. *Nature*, **267**, 641–643.
- Valenzuela, P., O'Farrell, P.Z., Cordell, B., Maynard, T., Goodman, H.M., and Rutter, W. J. (1980) Yeast tRNA precursors: structure and recognition of intervening sequences by an excision-ligase activity, in *Transfer RNA – Biological Aspects* (eds D. Söll, J.N. Abelson, and P.R. Schimmel), Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, pp. 191–208.
- Valenzuela, P., Medina, A., Rutter, W.J., Ammerer, G., and Hall, B.D. (1982) Synthesis and assembly of hepatitis B virus surface antigen particles in yeast. *Nature*, **298**, 347–350.
- Valli, M., Michael Sauer, M., Branduardi, P., Borth, N., Porro, D., and Mattanovich, D. (2006) Improvement of lactic acid production in *Saccharomyces cerevisiae* by cell sorting for high intracellular pH. *Applied and Environmental Microbiology*, **72**, 5492–5499.
- Valtz, N. and Herskowitz, I. (1996) Pea2 protein of yeast is localized to sites of polarized growth and is required for efficient mating and bipolar budding. *The Journal of Cell Biology*, **135**, 725–739.
- Valtz, N., Peter, M., and Herskowitz, I. (1995) FAR1 is required for oriented polarization of yeast cells in response to mating pheromones. *The Journal of Cell Biology*, **131**, 863–873.
- Vambutas, A., Ackerman, S.H., and Tzagoloff, A. (1991) Mitochondrial translational-initiation and elongation factors in *Saccharomyces cerevisiae*. *European Journal of Biochemistry*, **201**, 643–652.
- Van Attikum, H. and Gasser, S.M. (2005) The histone code at DNA breaks: a guide to repair? *Nature Reviews Molecular Cell Biology*, **6**, 757–765.
- Van Dam, T.J. and Snel, B. (2008) Protein complex evolution does not involve extensive network rewiring. *PLoS Computational Biology*, **4**, e1000132.
- Van der Zand, A., Braakman, I., Geuze, H.J., and Tabak, H.F. (2006) The return of the peroxisome. *Journal of Cell Science*, **119**, 989–994.
- Van der Klei, I.J. and Veenhuis, M. (1996) Peroxisome biogenesis in the yeast *Hansenula polymorpha*: a structural and functional analysis. *Annals of the New York Academy of Sciences*, **804**, 47–59.
- Van der Klei, I.J. and Veenhuis, M. (2002) *Hansenula polymorpha*: a versatile model organism in peroxisome research, in *Hansenula polymorpha – Biology and Applications* (ed. G. Gellissen), Wiley-VCH Verlag GmbH, Weinheim, pp. 76–94.
- Van der Laan, M., Chacinska, A., Lind, M. et al. (2005) Pam17 is required for architecture and translocation activity of the mitochondrial protein import motor. *Molecular and Cellular Biology*, **25**, 7449–7458.
- Van der Leij, I., van denBerg, M., Boot, R., Franse, M., Distel, B., and Tabak, H.F. (1992) Isolation of peroxisome assembly mutants from *Saccharomyces cerevisiae* with different morphologies using a novel positive selection procedure. *The Journal of Cell Biology*, **119**, 53–162.
- Van der Leij, I., Franse, M.M., Elgersma, Y., Distel, B., and Tabak, H.F. (1993) Pas10 is a tetratricopeptide-repeat protein that is essential for the import of most matrix proteins into peroxisomes of *Saccharomyces cerevisiae*. *Proceedings of the National Academy of Sciences of the United States of America*, **90**, 11782–11786.
- Van der Rest, M.E., Kamminga, A.H., Nakano, A., Anraku, Y., Pollman, B., and Konings, W. N. (1995) The Plasma Membrane of *Saccharomyces cerevisiae*: Structure, Function, and Biogenesis. *Microbiology and Molecular Biology Reviews*, **59**, 304–322.
- Van der Rest, M.E., Kamminga, A.H., Nakano, A., Anraku, Y., Pollman, B., and Konings, W. N. (1995) The plasma membrane of *Saccharomyces cerevisiae*: structure, function, and biogenesis. *Microbiology and Molecular Biology Reviews*, **59**, 304–322.
- Van Dijk, P., Gorwa, M.F., Lemaire, K. et al. (2000) Characterization of a new set of mutants deficient in fermentation-induced loss of stress resistance for use in frozen dough applications. *International Journal of Food Microbiology*, **55**, 187–192 (review).
- Van Dijk, R., Faber, K.N., Hammond, A.T., Glick, B.S., Veenhuis, M., and Kiel, J. (2001) Tagging *Hansenula polymorpha* genes by random integration of linear DNA fragments (RALF). *Molecular Genetics and Genomics*, **266**, 646–656.
- Van Dyck, L., Pearce, D.A., and Sherman, F. (1994) *PIM1* encodes a mitochondrial ATP-dependent protease that is required for mitochondrial function in the yeast *Saccharomyces cerevisiae*. *The Journal of Biological Chemistry*, **269**, 238–242.
- Van Heerikhuizen, H., Ykema, A., Klootwijk, J., Gaillardin, C., Ballas, C., and Fournier, P. (1985) Heterogeneity in the ribosomal RNA genes of the yeast *Yarrowia lipolytica*; cloning and analysis of two size classes of repeats. *Genetics*, **39**, 213–222.
- Van het Hoog, M., Rast, T.J., Martchenko, M. et al. (2007) Assembly of the *Candida albicans* genome into sixteen supercontigs aligned on the eight chromosomes. *Genome Biology*, **8**, R52.
- Van Ho, A., McVey Ward, D., and Kaplan, J. (2002) Transition metal transport in yeast. *Annual Review of Microbiology*, **56**, 237–261.
- Van Hoof, A., Lennertz, P., and Parker, R. (2000) Yeast exosome mutants accumulate

- 3'-extended polyadenylated forms of U4 small nuclear RNA and small nucleolar RNAs. *Molecular and Cellular Biology*, **20**, 441–452.
- Van Komen, S., Reddy, M.S., Krejci, L., Klein, H., and Sung, P. (2003) ATPase and DNA helicase activities of the *Saccharomyces cerevisiae* anti-recombinase Srs2. *The Journal of Biological Chemistry*, **278**, 44331–44337.
- Van Roermund, C.W.T., Hetteema, E.H., Kal, A. J., van den Berg, M., Tabak, H.F., and Wanders, R.J.A. (1998) Peroxisomal β -oxidation of polyunsaturated fatty acids in *Saccharomyces cerevisiae*: isocitrate dehydrogenase provides NADPH for reduction of double bonds at even positions. *The EMBO Journal*, **17**, 677–687.
- Vanacova, S., Wolf, J., Martin, G. et al. (2005) A new yeast poly(A) polymerase complex involved in RNA quality control. *PLoS Biology*, **3**, e189.
- VanBelle, D. and André, B. (2001) A genomic view of yeast membrane transporters. *Current Opinion in Cell Biology*, **13**, 389–398.
- VanDemark, A.P., Blankensma, M., Ferris, E., Heroux, A., Hill, C.P., and Formosa, T. (2006) The structure of the yFACT Pob3-M domain, its interaction with the DNA replication factor RPA, and a potential role in nucleosome deposition. *Molecular Cell*, **22**, 363–374.
- VanLoon, A.P., Brandli, A.W., Pesold-Hurt, B., Blank, D., and Schatz, G. (1987) Transport of proteins to the mitochondrial intermembrane space: the “matrix-targeting” and the “sorting” domains in the cytochrome c_1 presequence. *The EMBO Journal*, **6**, 2433–2439.
- Vanrobays, E., Gleizes, P.E., Bousquet-Antonelli, C., Noillac-Depeyre, J., Caizergues-Ferrer, M., and Gelugne, J.P. (2001) Processing of 20S pre-rRNA to 18S ribosomal RNA in yeast requires Rrp10p, an essential non-ribosomal cytoplasmic protein. *The EMBO Journal*, **20**, 4204–4213.
- Varanasi, U.S., Klis, M., Mikesell, P.B., and Trumbly, R.J. (1996) The Sn6–Tup1 corepressor complex is composed of one Cyc8 and four Tup1 subunits. *Molecular and Cellular Biology*, **16**, 6707–6714.
- Vargas, F.A., Pizarro, F., Pérez-Correa, J.R., and Agosin, E. (2011) Expanding a dynamic flux balance model of yeast fermentation to genome-scale. *BMC Systems Biology*, **5**, 75.
- Varmus, H.E. (1982) Form and function of retroviral proviruses. *Science*, **216**, 812–820 (review).
- Varshavsky, A. (1992) The N-end rule. *Cell*, **69**, 725–735.
- Varshavsky, A. (2006) The early history of the ubiquitin field. *Protein Science*, **15**, 647–654.
- Vassarotti, A., Dujon, B., Mordant, P., Feldmann, H., Mewes, W., and Goffeau, A. (1995) Structure and organization of the European yeast genome sequencing network. *Journal of Biotechnology*, **41**, 131–137.
- Vasu, S.K. and Forbes, D.J. (2001) Nuclear pores and nuclear assembly. *Current Opinion in Cell Biology*, **13**, 363–375.
- Veatch, J.R., McMurray, M.A., Nelson, Z.W., and Gottschling, D.E. (2009) Mitochondrial dysfunction leads to nuclear genome instability via an iron–sulfur cluster defect. *Cell*, **137**, 1247–1258.
- Veen, M. and Lang, C. (2004) Production of lipid compounds in the yeast *Saccharomyces cerevisiae*. *Applied Microbiology and Biotechnology*, **63**, 635–646.
- Velculesco, V., Zhang, L., Zhou, W. et al. (1997) Characterization of the yeast transcriptome. *Cell*, **88**, 243–251.
- Veldman, G.M., Klootwijk, J., deRegt, V.C. et al. (1981) The primary and secondary structure of yeast 26S rRNA. *Nucleic Acids Research*, **9**, 6935–6952.
- Velten, J., Fukada, K., and Abelson, J. (1976) *In vitro* construction of bacteriophage lambda and plasmid DNA molecules containing DNA fragments from bacteriophage T4. *Genetics*, **1**, 93–106.
- Venancio, T.M., Balaji, S., Iyer, L.M., and Aravind, L. (2009) Reconstructing the ubiquitin network: cross-talk with other systems and identification of novel functions. *Genome Biology*, **10**, R33.
- Venters, B.J., Wachi, S., Mavrich, T.N. et al. (2011) A comprehensive genomic binding map of gene and chromatin regulatory proteins in *Saccharomyces*. *Molecular Cell*, **41**, 480–492.
- Venturi, C.B., Erkin, A.M., and Gross, D.S. (2000) Cell cycle-dependent binding of yeast heat shock factor to nucleosomes. *Molecular and Cellular Biology*, **20**, 6435–6448.
- Verdone, L., Galardi, S., Page, D., and Beggs, J. D. (2004) Lsm proteins promote regeneration of pre-mRNA splicing activity. *Current Biology*, **14**, 1487–1491.
- Verdone, L., Caserta, M., and Di Mauro, E. (2005) Role of histone acetylation in the control of gene expression. *Biochemistry and Cell Biology*, **83**, 344–353.
- Verdone, L., Agricola, E., Caserta, M., and Di Mauro, E. (2006) Histone acetylation in gene regulation. *Briefings in Functional Genomics and Proteomics*, **5**, 209–221.
- Vergassola, M., Vespignani, A., and Dujon, B. (2005) Cooperative evolution in protein complexes of yeast from comparative analyses of its interaction network. *Proteomics*, **5**, 3116–3119.
- Vermitsky, J.P., Earhart, K.D., Smith, W.L., Homayouni, R., Edlind, T.D., and Rogers, P. D. (2006) Pdr1 regulates multidrug resistance in *Candida glabrata*: gene disruption and genome-wide expression studies. *Molecular Microbiology*, **61**, 704–722.
- Verner, K. (1993) Co-translational protein import into mitochondria: an alternative view. *Trends in Biochemical Sciences*, **18**, 366–371.
- Vernis, L., Abbas, A., Chasles, M. et al. (1997) A origin of replication and a centromere are both needed to establish a replicative plasmid in the yeast *Yarrowia lipolytica*. *Molecular and Cellular Biology*, **17**, 1995–2004.
- Vernis, L., Chasles, M., Pasero, P., Lepingle, A., Gaillardin, C., and Fournier, P. (1999) Short DNA fragments without sequence similarity are initiation sites for replication in the chromosome of the yeast *Yarrowia lipolytica*. *Molecular Biology of the Cell*, **10**, 757–769.
- Vernis, L., Poljak, L., Chasles, M. et al. (2001) Only centromeres can supply the partition system required for ARS function in the yeast *Yarrowia lipolytica*. *Journal of Molecular Biology*, **305**, 203–217.
- VerPlank, L. and Li, R. (2005) Cell cycle-regulated trafficking of Chs2 controls actomyosin ring stability during cytokinesis. *Molecular Biology of the Cell*, **16**, 2529–2543.
- Verschoor, A., Warner, J.R., Srivastava, S., Grassucci, R.A., and Frank, J. (1998) Three-dimensional structure of the yeast ribosome. *Nucleic Acids Research*, **26**, 655–661.
- Versele, M. and Thevelein, J.M. (2001) Lre1 affects chitinase expression, trehalose accumulation and heat resistance through inhibition of the Cbk1 protein kinase in *Saccharomyces cerevisiae*. *Molecular Microbiology*, **41**, 1311–1326.
- Versele, M. and Thormer, J. (2005) Some assembly required: yeast septins provide the instruction manual. *Trends in Cell Biology*, **15**, 414–424.
- Versele, M., de Winde, J.H., and Thevelein, J.M. (1999) A novel regulator of G protein signalling in yeast, Rgs2, downregulates glucose-activation of the cAMP pathway through direct inhibition of Gpa2. *The EMBO Journal*, **18**, 5577–5591.
- Vershon, A.K. and Pierce, M. (2000) Transcriptional regulation of meiosis in yeast. *Current Opinion in Cell Biology*, **12**, 334–339.
- Verstrepen, K.J. and Thevelein, J.M. (2004) Controlled expression of homologous genes by genomic promoter replacement in the yeast *Saccharomyces cerevisiae*. *Methods in Molecular Biology (Clifton, NJ)*, **267**, 259–266.
- Verwaal, R., Jiang, Y., Wang, J. et al. (2010) Heterologous carotenoid production in *Saccharomyces cerevisiae* induces the pleiotropic drug resistance stress response. *Yeast (Chichester, England)*, **12**, 983–998.
- Vestweber, D., Brunner, J., Baker, A., and Schatz, G. (1989) A 42K outer-membrane protein is a component of the yeast mitochondrial protein import site. *Nature*, **341**, 205–209.
- Vetting, M.W., SdC, L.P., Yu, M. et al. (2005) Structure and functions of the GNAT superfamily of acetyltransferases. *Archives of Biochemistry and Biophysics*, **433**, 212–226.
- Vetvicka, V. (2011) Glucan-immunostimulant, adjuvant, potential drug. *World Journal of Clinical Oncology*, **2**, 115–119.
- Vida, T.A., Herman, P.K., Emr, S.D., and Graham, T.R. (1991) Compartmentalized transport, modification, and sorting of yeast vacuolar hydrolases. *Biomedica Biochimica Acta*, **50**, 413–420 (review).
- Vigliotta, G., Di Giacomo, M., Carata, E. et al. (2007) Nitrite metabolism in *Debaryomyces hansenii* TOB-Y7, a yeast strain involved in tobacco fermentation. *Applied Microbiology and Biotechnology*, **75**, 633–645.
- Vilella, F., Herrero, E., Torres, J., and de la Torre-Ruiz, M.A. (2005) Pkc1 and the upstream elements of the cell integrity pathway in *Saccharomyces cerevisiae*, Rom2 and Mtl1, are required for cellular responses to oxidative stress. *The Journal of Biological Chemistry*, **280**, 9149–9159.
- Vinogradov, A.E. and Anatskaya, O.V. (2009) Loss of protein interactions and regulatory divergence in yeast whole-genome duplicates. *Genomics*, **93**, 534–542.
- Visintin, R., Craig, K., Hwang, E.S., Prinz, S., Tyers, M., and Amon, A. (1998) The phosphatase Cdc14 triggers mitotic exit by reversal of Cdk-dependent phosphorylation. *Molecular Cell*, **2**, 709–718.
- Visser, W., Scheffers, W.A., Batenburg-van der Vegte, W.H., and van Dijken, J.P. (1990)

- Oxygen requirements of yeasts. *Applied and Environmental Microbiology*, **56**, 3785–3792.
- Viswanathan, M., Muthukumar, G., Cong, Y.S., Lenard, J. (1994) Seripauperins of *Saccharomyces cerevisiae*: a new multigene family encoding serine-poor relatives of serine-rich proteins. *Gene*, **148**, 149–53.
- Vizeacoumar, F.J., Torres-Guzman, J.C., Bouard, D., Aitchison, J.D., and Rachubinski, R.A. (2004) Pex30p, Pex31p and Pex32p form a family of peroxisomal integral membrane proteins regulating peroxisome size and number in *Saccharomyces cerevisiae*. *Molecular Biology of the Cell*, **15**, 665–677.
- Völkel, P., Le Faou, P., and Angrand, P.O. (2010) Interaction proteomics: characterization of protein complexes using tandem affinity purification-mass spectrometry. *Biochemical Society Transactions*, **38**, 883–887.
- Vogel, J. and Snyder, M. (2000) Gamma-tubulin of budding yeast. *Current Topics in Developmental Biology*, **49**, 75–104.
- Volchuk, A., Ravazzola, M., Perrelet, A. et al. (2004) Countercurrent distribution of two distinct SNARE complexes mediating transport within the Golgi stack. *Molecular Biology of the Cell*, **15**, 1506–1518.
- Volkert, F.C., Wilson, D.W., and Broach, J.R. (1989) Desoxyribonucleic acid plasmids in yeast. *Microbiological Reviews*, **53**, 299–317.
- von Mering, C., Huynen, M., Jaeggi, D., Schmidt, S., Bork, P., and Snel, B. (2003) STRING: a database of predicted functional associations between proteins. *Nucleic Acids Research*, **31**, 258–261.
- Voornt-Brouwer, T., van der Leij, I., Hemrika, W., Distel, B., and Tabak, H.F. (1993) Sequence of the *PAS8* gene, the product of which is essential for biogenesis of peroxisomes in *Saccharomyces cerevisiae*. *Biochimica et Biophysica Acta*, **1216**, 325–328.
- Vorapreeda, T., Thammamongtham, C., Cheevadhanarak, S., and Laoteng, K. (2011) Alternative routes of acetyl-CoA synthesis identified by comparative genomic analysis, Involvement in lipid production of oleaginous yeast and fungi. *Microbiology (Reading, England)*, doi: 10.1099/mic.0.051946-0.
- Voytas, D.F. and Boeke, J.D. (1993) Yeast retrotransposons and tRNAs. *Trends in Genetics*, **9**, 421–427.
- Wach, A., Brachat, A., Pohlmann, R., and Philippsen, P. (1994a) New heterologous modules for classical or PCR-based gene disruptions in *Saccharomyces cerevisiae*. *Yeast (Chichester, England)*, **10**, 1793–1808.
- Wach, A., Pick, H. and Philippsen, P. (1994b) Procedures for isolating yeast DNA for different purposes, in *Molecular Genetics of Yeast: A Practical Approach* (ed. J.R. Johnston), IRL Press, Oxford, pp. 1–16.
- Wach, A., Brachat, A., Alberti-Segui, C., Rebischung, C., and Philippsen, P. (1997) Heterologous HIS3 marker and GFP reporter modules for PCR-targeting in *Saccharomyces cerevisiae*. *Yeast (Chichester, England)*, **13**, 1065–1075.
- Wade, P.A. and Wolffe, A.P. (1997) Histone acetyltransferases in control. *Current Biology*, **7**, R82–R84 (review).
- Wade, P.A. and Wolffe, A.P. (1999) Transcriptional regulation: SWItching circuitry. *Current Biology*, **9**, R221–R224 (review).
- Wade, J.T., Hall, D.B., and Struhl, K. (2004) The transcription factor Ifh1 is a key regulator of yeast ribosomal protein genes. *Nature*, **432**, 1054–1058.
- Wagner, P., Hengst, L., and Gallwitz, D. (1992) Ypt proteins in yeast. *Methods in Enzymology*, **219**, 369–87.
- Wagner, I., Arlt, H., vanDyck, L., Langer, T., and Neupert, W. (1994) Molecular chaperones cooperate with Pim1 protease in the degradation of misfolded proteins in mitochondria. *The EMBO Journal*, **13**, 5135–5145.
- Wagner, I., vanDyck, L., Savel'ev, A.S., Neupert, W., and Langer, T. (1997) Autocatalytic processing of the ATP-dependent Pim1 protease: crucial function of a pro-region for sorting to mitochondria. *The EMBO Journal*, **16**, 7317–7325.
- Wahle, E. and Keller, W. (1996) The biochemistry of polyadenylation. *Trends in Biochemical Sciences*, **21**, 247–250.
- Wahlin, J. and Cohn, M. (2000) *Saccharomyces cerevisiae* RAP1 binds to telomeric sequences with spatial flexibility. *Nucleic Acids Research*, **28**, 2292–2301.
- Walker, S.C. and Engelke, D.R. (2006) Ribonuclease P: the evolution of an ancient RNA enzyme. *Critical Reviews in Biochemistry and Molecular Biology*, **41**, 77–102.
- Walker, J.E. (1997) *ATP synthesis by rotary catalysis*, Nobel Lecture.
- Wallace, J.C. and Edmonds, M. (1983) Polyadenylated nuclear RNA contains branches. *Proceedings of the National Academy of Sciences of the United States of America*, **80**, 950–954.
- Walsh, G. (2006) Biopharmaceutical benchmarks 2006. *Nature Biotechnology*, **24**, 769–776.
- Wang, S.A. and Bai, F.Y. (2008) *Saccharomyces arboricolus* sp. nov., a yeast species from tree bark. *International Journal of Systematic and Evolutionary Microbiology*, **58**, 510–514.
- Wang, Y. and Guthrie, C. (1998) PRP16, a DEAH-box RNA helicase, is recruited to the spliceosome primarily via its nonconserved N-terminal domain. *RNA (New York, NY)*, **4**, 1216–1229.
- Wang, K.L. and Warner, J.R. (1998) Positive and negative autoregulation of REB1 transcription in *Saccharomyces cerevisiae*. *Molecular and Cellular Biology*, **18**, 4368–4376.
- Wang, C.K. and Weil, P.A. (1989) Purification and characterization of *Saccharomyces cerevisiae* transcription factor IIIA. *The Journal of Biological Chemistry*, **264**, 1092–1099.
- Wang, Z., Svejstrup, J.Q., Feaver, W.J., Wu, X., Kornberg, R.D., and Friedberg, E.C. (1994) Transcription factor b (TFIIH) is required during nucleotide-excision repair in yeast. *Nature*, **368**, 74–76.
- Wang, Y., Hu, F., and Elledge, S.J. (2000) The Bfa1/Bub2 GAP complex comprises a universal checkpoint required to prevent mitotic exit. *Current Biology*, **10**, 1379–1382.
- Wang, L., Mao, X., Ju, D., and Xie, Y. (2004a) Rpn4 is a physiological substrate of the Ubr2 ubiquitin ligase. *The Journal of Biological Chemistry*, **279**, 55218–55223.
- Wang, Y., Pierce, M., Schneper, L., Guldal, C.G., Zhang, X., Tavazoie, S., and Broach, J.R. (2004a) Ras and Gpa2 mediate one branch of a redundant glucose signaling pathway in yeast. *PLoS Biol.*, **2**, 0610–0622.
- Wang, L., Renault, G., Garreau, H., and Jacquet, M. (2004b) Stress induces depletion of Cdc25p and decreases the cAMP producing capability in *Saccharomyces cerevisiae*. *Microbiology (Reading, England)*, **150**, 3383–3391.
- Wang, Y., Pierce, M., Schneper, L. et al. (2004c) Ras and Gpa2 mediate one branch of a redundant glucose signaling pathway in yeast. *PLoS Biology*, **2**, 0610–0622.
- Wang, B.D., Eyre, D., Basrai, M., Lichten, M., and Strunnikov, A. (2005a) Condensin binding at distinct and specific chromosomal sites in the *Saccharomyces cerevisiae* genome. *Molecular and Cellular Biology*, **25**, 7216–7225.
- Wang, L., Haeusler, R.A., Good, P.D., Thompson, M., Nagar, S., and Engelke, D.R. (2005b) Silencing near tRNA genes requires nucleolar localization. *The Journal of Biological Chemistry*, **280**, 8637–8639.
- Wang, Y., Nakashima, N., Sekiguchi, T., and Nishimoto, T. (2005c) *Saccharomyces cerevisiae* GTPase complex: Gtr1p–Gtr2p regulates cell-proliferation through *Saccharomyces cerevisiae* Ran-binding protein, Yrb2p. *Biochemical and Biophysical Research Communications*, **336**, 639–645.
- Wang, D., Bushnell, D.A., Westover, K.D., Kaplan, C.D., and Kornberg, R.D. (2006a) Structural basis of transcription: role of the trigger loop in substrate specificity and catalysis. *Cell*, **127**, 941–954.
- Wang, W., Cajigas, I.J., Peltz, S.W., Wilkinson, M.F., and Gonzalez, C.I. (2006b) Role for Upf2p phosphorylation in *Saccharomyces cerevisiae* nonsense-mediated mRNA decay. *Molecular and Cellular Biology*, **26**, 3390–3400.
- Wang, Y.L., Faiola, F., Xu, M., Pan, S. and Martinez, E. (2008) Human ATAC is a GCN5/PCAF-containing acetylase complex with a novel NC2-like histone fold module that interacts with the TATA-binding protein. *The Journal of Biological Chemistry*, **283**, 33808–33815.
- Wang, H., Xu, Z., Gao, L., and Hao, B. (2009a) A fungal phylogeny based on 82 complete genomes using the composition vector method. *BMC Evolutionary Biology*, **9**, 195.
- Wang, Z.R., Guo, L., Chen, L., and McEachern, M.J. (2009b) Evidence for an additional base-pairing element between the telomeric repeat and the telomerase RNA template in *Kluyveromyces lactis* and other yeasts. *Molecular and Cellular Biology*, **29**, 5389–5398.
- Wapinski, I., Pfeffer, A., Friedman, N., and Regev, A. (2007) Natural history and evolutionary principles of gene duplication in fungi. *Nature*, **449**, 54–64.
- Wapinski, I., Pfiffner, J., French, C., Socha, A., Thompson, D.A., and Regev, A. (2010) Gene duplication and the evolution of ribosomal protein gene regulation in yeast. *Proceedings of the National Academy of Sciences of the United States of America*, **107**, 5505–5510.
- Warner, J.R., Kumar, A., Udem, S.A., and Wu, R. S. (1973) Ribosomal proteins and the assembly of ribosomes in eukaryotes. *Biochemical Society Symposium*, **37**, 3–22 (review).

- Warner, J.R. (1971) The assembly of ribosomes in yeast. *The Journal of Biological Chemistry*, **246**, 447–454.
- Warner, J.R. (2001) Nascent ribosomes. *Cell*, **107**, 133–136 (review).
- Wartmann, T. and Kunze, G. (2000) Genetic transformation and biotechnological application of the yeast *Arxula adenivorans*. *Applied Microbiology and Biotechnology*, **54**, 619–624 (review).
- Wartmann, T., Kruger, A., Adler, K., Duc, B.M., Kunze, I., and Kunze, G. (1995) Temperature-dependent dimorphism of the yeast *Arxula adenivorans* Ls3. *Antonie van Leeuwenhoek*, **68**, 215–223.
- Wartmann, T., Rosel, H., Kunze, I., Bode, R., and Kunze, G. (1998) AILV1 gene from the yeast *Arxula adenivorans* LS3 – a new selective transformation marker. *Yeast (Chichester, England)*, **14**, 1017–1025.
- Washburn, M.P., Wolters, D., and Yates, J.R.3rd (2001) Large-scale analysis of the yeast proteome by multidimensional protein identification technology. *Nature Biotechnology*, **19**, 242–247.
- Watanabe, R. and Riezman, H. (2004) Differential ER exit in yeast and mammalian cells. *Current Opinion in Cell Biology*, **16**, 350–355. Review.
- Watanabe, R., Inoue, N., Westfall, B. et al. (1998) The first step of glycosylphosphatidylinositol biosynthesis is mediated by a complex of PIG-A, PIG-H, PIG-C and GPI1. *The EMBO Journal*, **17**, 877–885.
- Watanabe, Y. (2004) Modifying sister chromatid cohesion for meiosis. *Journal of Cell Science*, **117**, 4017–4023.
- Watanabe, Y. (2005) Shugoshin: guardian spirit at the centromere. *Current Opinion in Cell Biology*, **17**, 590–595.
- Waters, M.G. and Blobel, G. (1986) Secretory protein translocation in a yeast cell-free system can occur posttranslationally and requires ATP hydrolysis. *The Journal of Cell Biology*, **102**, 1543–1550.
- Waters, M.G., Griff, I.C., and Rothman, J.E. (1991) Proteins involved in vesicular transport and membrane fusion. *Current Opinion in Cell Biology*, **3**, 615–620 (review).
- Watson, A.D., Edmondson, D.G., Bone, J.R. et al. (2000) Ssn6–Tup1 interacts with class I histone deacetylases required for repression. *Genes and Development*, **14**, 2737–2744.
- Watson, M.L. (1954) Pores in the mammalian nuclear membrane. *Biochimica et Biophysica Acta*, **15**, 475–479.
- Wattanachaisareekul, S., Lantz, A.E., Nielsen, M.L., and Nielsen, J. (2008) Production of the polyketide 6-MSA in yeast engineered for increased malonyl-CoA supply. *Metabolic Engineering*, **10**, 246–254.
- Weake, V.M. and Workman, J.L. (2008) Histone ubiquitination: triggering gene activity. *Molecular Cell*, **29**, 653–663.
- Weaver, J.C. and Chizmadzhev, Y.A. (1996) Theory of electroporation: a review. *Biochem Bioenergetics*, **41**, 135–160.
- Weber, J. and Senior, A.E. (2000) ATP synthase: what we know about ATP hydrolysis and what we do not know about ATP synthesis. *Biochimica et Biophysica Acta*, **1458**, 300–309. Review.
- Weber, C., Farwick, A., Bemisch, F. et al. (2010) Trends and challenges in the microbial production of lignocellulosic bioalcohol fuels. *Applied Microbiology and Biotechnology*, **87**, 1303–1315 (review).
- Wedaman, K.P., Reinke, A., Anderson, S., Yates, J.3rd, McCaffery, J.M., and Powers, T. (2003) Tor kinases are in distinct membrane-associated protein complexes in *Saccharomyces cerevisiae*. *Molecular Biology of the Cell*, **14**, 1204–1220.
- Wee, S., Heffeld, B., Dubiel, W., and Wolf, D.A. (2002) Conservation of the COP9/signalosome in budding yeast. *BMC Genetics*, **3**, 15.
- Wegele, H., Haslbeck, M., Reinstein, J., and Buchner, J. (2003) Sti1 is a novel activator of the Ssa proteins. *The Journal of Biological Chemistry*, **278**, 25970–25976.
- Wei, W., McCusker, J.H., Hyman, R.W. et al. (2007) Genome sequencing and comparative analysis of *Saccharomyces cerevisiae* strain YJM789. *Proceedings of the National Academy of Sciences of the United States of America*, **104**, 12825–12830.
- Weil, P.A., Luse, D.S., Segall, J., and Roeder, R.G. (1979) Selective and accurate initiation of transcription at the Ad2 major late promoter in a soluble system dependent on purified RNA polymerase II and DNA. *Cell*, **18**, 469–484.
- Weinberg, D.E., Nakanishi, K., Patel, D.J., and Bartel, D.P. (2011) The inside-out mechanism of Dicers from budding yeasts. *Cell*, **146**, 262–276.
- Weinmann, R. and Roeder, R.G. (1974) Role of DNA-dependent RNA polymerase 3 in the transcription of the tRNA and 5S RNA genes. *Proceedings of the National Academy of Sciences of the United States of America*, **71**, 1790–1794.
- Weinreich, M., Liang, C., Chen, H.H., and Stillman, B. (2001) Binding of cyclin-dependent kinases to ORC and Cdc6p regulates the chromosome replication cycle. *Proceedings of the National Academy of Sciences of the United States of America*, **98**, 11211–11217.
- Weir, J.R., Bonneau, F., Hentschel, J., and Conti, E. (2010) Structural analysis reveals the characteristic features of Mtr4, a DEXH helicase involved in nuclear RNA processing and surveillance. *Proceedings of the National Academy of Sciences of the United States of America*, **107**, 12139–12144.
- Weisman, L.S., Bacallao, R., and Wickner, W. (1987) Multiple methods of visualizing the yeast vacuole permit evaluation of its morphology and inheritance during the cell cycle. *The Journal of Cell Biology*, **105**, 1539–1547.
- Weissenbach, J., Kiraly, I., and Dirheimer, G. (1977) Primary structure of tRNA Thr 1a and b from brewer's yeast. *Biochimie*, **59**, 381–391.
- Weitzer, S., Lehane, C., and Uhlmann, F. (2003) A model for ATP hydrolysis-dependent binding of cohesin to DNA. *Current Biology*, **13**, 1930–1940.
- Wen, J. and Brogna, S. (2008) Nonsense-mediated mRNA decay. *Biochemical Society Transactions*, **36**, 514–516.
- Wendland, J. and Walther, A. (2005) *Ashbya gossypii*, a model for fungal developmental biology. *Nature Reviews Microbiology*, **3**, 421–429.
- Wente, S.R., Rout, M.P., and Blobel, G. (1992) A new family of yeast nuclear pore complex proteins. *The Journal of Cell Biology*, **119**, 705–723.
- Werner, M., Chaussivert, N., Willis, I.M., and Sentenac, A. (1993) Interaction between a complex of RNA polymerase III subunits and the 70-kDa component of transcription factor IIIB. *The Journal of Biological Chemistry*, **268**, 20721–20724.
- Werner-Washburne, M., Stone, D.E., and Craig, E.A. (1987) Complex interactions among members of an essential subfamily of hsp70 genes in *Saccharomyces cerevisiae*. *Molecular and Cellular Biology*, **7**, 2568–2577.
- Wesolowski-Louvel, M., Goffrini, P., Ferrero, I., and Fukuhara, H. (1992) Glucose-transport in the yeast *Kluyveromyces lactis*. 1. Properties of an inducible low-affinity glucose transporter gene. *Molecular & General Genetics*, **233**, 89–96.
- Wesolowski-Louvel, M., Breunig, K., and Fukuhara, H. (1996) *Kluyveromyces lactis*, in *Non Conventional Yeasts in Biotechnology* (ed. K. Wolf), Springer, Berlin, pp. 139–201.
- Wesp, A., Hicke, L., Palecek, J. et al. (1997) End4p/Sla2p interacts with actin-associated proteins for endocytosis in *Saccharomyces cerevisiae*. *Molecular Biology of the Cell*, **8**, 2291–2306.
- West, R.W.Jr, Yocum, R.R., and Ptashne, M. (1984) *Saccharomyces cerevisiae* GAL1–GAL10 divergent promoter region: location and function of the upstream activating sequence UASG. *Molecular and Cellular Biology*, **4**, 2467–2478.
- Westermann, S., Drubin, D.G., and Barnes G. (2007) Structures and functions of yeast kinetochore complexes. *Annual Review of Biochemistry*, **76**: 563–91. Review.
- Westover, K.D., Bushnell, D.A., and Kornberg, R.D. (2004) Structural basis of transcription: separation of RNA from DNA by RNA polymerase II. *Science*, **303**, 1014–1016.
- White, P.J., Borts, R.H., and Hirst, M.C. (1999) Stability of the human fragile X (CGG)_n triplet repeat array in *Saccharomyces cerevisiae* deficient in aspects of DNA metabolism. *Molecular and Cellular Biology*, **19**, 5675–5684.
- White, H.E., Hicke, L., Palecek, J. et al. (2006) Multiple distinct assemblies reveal conformational flexibility in the small heat shock protein Hsp26. *Structure (London, England: 1993)*, **14**, 1197–1204.
- Whitehall, S.K., Kassavetis, G.A., and Geiduschek, E.P. (1995) The symmetry of the yeast U6 RNA gene's TATA box and the orientation of the TATA-binding protein in yeast TFIIB. *Genes and Development*, **9**, 2974–2985.
- Whitney, M.L., Hurto, R.L., Shaheen, H.H., and Hopper, A.K. (2007) Rapid and reversible nuclear accumulation of cytoplasmic tRNA in response to nutrient availability. *Molecular Biology of the Cell*, **18**, 2678–2686.
- Wichmann, H., Hengst, L., and Gallwitz, D. (1992) Endocytosis in yeast: evidence for the involvement of a small GTP-binding protein (Ypt7p). *Cell*, **71**, 1131–1142.
- Wicker, T., Sabot, F., Hua-Van, A. et al. (2007) A unified classification system for eukaryotic transposable elements. *Nature Reviews Genetics*, **8**, 973–982.

- Wickner, R.B., Masison, D.C., and Edskes, H.K. (1996) [URE3] and [PSI] as prions of *Saccharomyces cerevisiae*. *Seminars in Virology*, **7**, 215–223.
- Wickner, R.B., Edskes, H.K., Shewmaker, F., and Nakayashiki, T. (2007) Prions of fungi: inherited structures and biological roles. *Nature Reviews Microbiology*, **5**, 611–618.
- Wickner, R.B. (1994) [URE3] as an altered Ure2 protein: evidence for a prion analog in *Saccharomyces cerevisiae*. *Science*, **264**, 566–569.
- Wickner, R.B. (1995) Prions of yeast and heat-shock protein 104: ‘coprion’ and cure. *Trends in Microbiology*, **3**, 367–369. Review.
- Wickner, R.B. (1996) Double-stranded RNA viruses of *S. cerevisiae*. *Annual Review of Microbiology*, **60**, 250–265 (review).
- Wiesel, F.F. and Kunau, W.H. (1992) The Pas2 protein essential for peroxisome biogenesis is related to ubiquitin-conjugating enzymes. *Nature*, **359**, 73–76.
- Wiedemann, N., Kozjak, V., Chacinska, A. *et al.* (2003) Machinery for protein sorting and assembly in the mitochondrial outer membrane. *Nature*, **424**, 565–571.
- Wiedemann, N., Truscott, K.N., Pfannschmidt, S., Guiard, B., Meisinger, C., and Pfanner, N. (2004) Biogenesis of the protein import channel Tom40 of the mitochondrial outer membrane: intermembrane space components are involved in an early stage of the assembly pathway. *The Journal of Biological Chemistry*, **279**, 18188–18194.
- Wiederhold, K. and Passmore, L.A. (2010) Cytoplasmic deadenylation: regulation of mRNA fate. *Biochemical Society Transactions*, **38**, 1531–1536.
- Wiederkehr, A., Avaro, S., Prescianotto-Baschong, C., Haguenaue-Tsapis, R., and Riezman, H. (2000) The F-box protein Rcy1p is involved in endocytic membrane traffic and recycling out of an early endosome in *Saccharomyces cerevisiae*. *The Journal of Cell Biology*, **149**, 397–410.
- Wilhelm, M., Heyman, T., Friant, S., and Wilhelm, F.X. (1997) Heterogeneous terminal structure of Ty1 and Ty3 reverse transcripts. *Nucleic Acids Research*, **25**, 2161–2166.
- Wilkins, M.R., Pasquali, C., Appel, R.D. *et al.* (1996) From proteins to proteomes: large scale protein identification by two-dimensional electrophoresis and amino acid analysis. *Biotechnology (NY)*, **14**, 61–65.
- Wilkinson, L.E. and Pringle, J.R. (1974) Transient G₁ arrest of *S. cerevisiae* cells of mating type α by a factor produced by cells of mating type α . *Experimental Cell Research*, **89**, 175–187.
- Wilkinson, K.D., Lee, K., Deshpande, S., Duerksen-Hughes, P., Boss, J.M., and Pohl, J. (1989) The neuron-specific protein PGP 9.5 is a ubiquitin carboxyl-terminal hydrolase. *Science*, **246**, 670–673.
- Will, E., Albert, S., and Gallwitz, D. (2001) Expression, purification, and biochemical properties of Ypt/Rab GTPase-activating proteins of Gyp family. *Methods in Enzymology*, **329**, 50–58.
- Willems, A., Lancker, S., Patton, E. *et al.* (1996) Cdc53 targets phosphorylated G₁ cyclins for degradation by the ubiquitin proteolytic pathway. *Cell*, **86**, 453–463.
- Willems, A.R., Goh, T., Taylor, L., Chernushevich, I., Shevchenko, A., and Tyers, M. (1999) SCF ubiquitin protein ligases and phosphorylation-dependent proteolysis. *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences*, **354**, 1533–1550.
- Williams, D.M. and Cole, P.A. (2001) Kinase chips hit the proteomics era. *Trends in Biochemical Sciences*, **26**, 271–273.
- Williams, F.E., Varanasi, U., and Trumbly, R.J. (1991) The CYC8 and TUP1 proteins involved in glucose repression in *Saccharomyces cerevisiae* are associated in a protein complex. *Molecular and Cellular Biology*, **11**, 3307–3316.
- Williams, R.S., Shohet, R.V., and Stillman, B. (1997) A human protein related to yeast Cdc6p. *Proceedings of the National Academy of Sciences of the United States of America*, **94**, 142–147.
- Williams, L.R., Ellis, S.R., Hopper, A.K., Davis, E.O., and Martin, N.C. (2000) Splicing before import – an intein in a mitochondrially targeted preprotein folds and is catalytically active in the cytoplasm *in vivo*. *FEBS Letters*, **476**, 301–305.
- Williamson, V.M., Bennetzen, J., Young, E.T., Nasmyth, K., and Hall, B.D. (1980) Isolation of the structural gene for alcohol dehydrogenase by genetic complementation in yeast. *Nature*, **283**, 214–216.
- Willingham, S., Outeiro, T.F., DeVit, M.J., Lindquist, S.L., and Muchowski, P.J. (2003) Yeast genes that enhance the toxicity of a mutant huntingtin fragment or alpha-synuclein. *Science*, **302**, 1769–1772.
- Wilson, K.L. and Herskowitz, I. (1984) Negative regulation of *STE6* gene expression by the alpha 2 product of *Saccharomyces cerevisiae*. *Molecular and Cellular Biology*, **4**, 2420–2427.
- Wilson, B.A. and Masel, J. (2011) Putatively noncoding transcripts show extensive association with ribosomes. *Genome Biology and Evolution*, **3**, 1245–1252.
- Wilson, W., Malim, M.H., Mellor, J., Kingsman, A.J., and Kingsman, S.M. (1986) Expression strategies of the yeast retrotransposon Ty: a short sequence directs ribosomal frameshifting. *Nucleic Acids Research*, **14**, 7001–7016.
- Wilson, C.J., Chao, D.M., Imbalzano, A.N., Schnitzler, G.R., Kingston, R.E., and Young, R.A. (1996) RNA polymerase II holoenzyme contains SWI/SNF regulators involved in chromatin remodeling. *Cell*, **84**, 235–244.
- Wilson, M.A., St Amour, C.V., Collins, J.L., Ringe, D., and Petsko, G.A. (2004) The 1.8-Å resolution crystal structure of YDR533Cp from *Saccharomyces cerevisiae*: a member of the DJ-1/Thi1/Pfp1 superfamily. *Proceedings of the National Academy of Sciences of the United States of America*, **101**, 1531–1536.
- Winey, M., Goetsch, L., Baum, P., and Byers, B. (1991) MPS1 and MPS2: novel yeast genes defining distinct steps of spindle pole body duplication. *The Journal of Cell Biology*, **114**, 745–754.
- Winston, F. and Carlson, M. (1992) Yeast SNF/SWI transcriptional activators and the SPT/SIN chromatin connection. *Trends in Genetics*, **8**, 387–391 (review).
- Winston, J.T., Koepf, D.M., Zhu, C., Elledge, S. J., and Harper, J.W. (1999) A family of mammalian F-box proteins. *Current Biology*, **9**, 1180–1182.
- Winter, V. and Hauser, M.T. (2006) Exploring the ESCRTing machinery in eukaryotes. *Trends in Plant Science*, **11**, 115–123.
- Winter, D., Podtelejnikov, A.V., Mann, M., and Li, R. (1997) The complex containing actin-related proteins Arp2 and Arp3 is required for the motility and integrity of yeast actin patches. *Current Biology*, **7**, 519–529.
- Winzler, E.A., Shoemaker, D.D., Astromoff, A. *et al.* (1999) Functional characterization of the *S. cerevisiae* genome by gene deletion and parallel analysis. *Science*, **285**, 901–906.
- Winzler, E.A., Liang, H., Shoemaker, D.D., and Davis, R.W. (2000) Functional analysis of the yeast genome by precise deletion and parallel phenotypic characterization. *Novartis Foundation Symposium*, **229**, 105–109.
- Wippo, C.J., Krstulovic, B.S., Ertel, F. *et al.* (2009) Differential cofactor requirements for histone eviction from two nucleosomes at the yeast *PHO84* promoter are determined by intrinsic nucleosome stability. *Molecular and Cellular Biology*, **29**, 2960–2981.
- Wippo, C.J., Israel, L., Watanabe, S., Hochheimer, A., Peterson, C.L., and Korber, P. (2011) The RSC chromatin remodelling enzyme has a unique role in directing the accurate positioning of nucleosomes. *The EMBO Journal*, **30**, 1277–1288.
- Wise, J.A., Tollervey, J.D., Maloney, D., Swerdlow, H., Dunn, E.J., and Guthrie, C. (1983) Yeast contains small nuclear RNAs encoded by single copy genes. *Cell*, **35**, 743–751.
- Withers, S.T. and Keasling, J.D. (2007) Biosynthesis and engineering of isoprenoid small molecules. *Applied Microbiology and Biotechnology*, **73**, 980–990 (review).
- Witte, C., Jensen, R.E., Yaffe, M.P., and Schatz, G. (1988) *MAS1*, a gene essential for yeast mitochondrial assembly, encodes a subunit of the mitochondrial processing protease. *The EMBO Journal*, **7**, 1439–1447.
- Wittmann, T., Hyman, A., and Desai, A. (2001) The spindle: a dynamic assembly of microtubules and motors. *Nature Cell Biology*, **3**, E28–E34.
- Wolf, D.H. and Hilt, W. (2004) The proteasome: a proteolytic nanomachine of cell regulation and waste disposal. *Biochimica et Biophysica Acta*, **1695**, 19–31 (review).
- Wolf, D.H. and Schäfer, A. (2005) CPY* and the power of yeast genetics in the elucidation of quality control and associated protein degradation of the endoplasmic reticulum. *Current Topics in Microbiology and Immunology*, **300**, 41–56 (review).
- Wolfe, K.H. and Shields, D.C. (1997) Molecular evidence for an ancient duplication of the entire yeast genome. *Nature*, **387**, 708–713.
- Wolfe, K. (2004) Evolutionary genomics, yeasts accelerate beyond BLAST. *Current Biology*, **14**, R392–R394.
- Wolffe, A.P., Wong, J., and Pruss, D. (1997) Activators and repressors: making use of

- chromatin to regulate transcription. *Genes to Cells*, 2, 291–302 (review).
- Wolffe, A.P. (1991) RNA polymerase III transcription. *Current Opinion in Cell Biology*, 3, 461–466 (review).
- Wolffe, A.P. (1996) Histone deacetylase: a regulator of transcription. *Science*, 272, 371–372 (review).
- Wollert, T., Wunder, C., Lippincott-Schwartz, J., and Hurley, J.H. (2009) Membrane scission by the ESCRT-III complex. *Nature*, 458, 172–177.
- Wong, W.W. and Liao, J.C. (2006) The design of intracellular oscillators that interact with metabolism. *Cellular and Molecular Life Sciences*, 63, 1215–1220.
- Wong, S. and Wolfe, K.H. (2005) Birth of a metabolic gene cluster in yeast by adaptive gene relocation. *Nature Genetics*, 37, 777–782.
- Wong, E.D., Wagner, J.A., Gorsich, S.W., McCaffery, J.M., Shaw, J.M., and Nunnari, J. (2000) The dynamin-related GTPase, Mgm1p, is an intermembrane space protein required for maintenance of fusion competent mitochondria. *The Journal of Cell Biology*, 151, 341–352.
- Wong, C.M., Zhou, Y., Ng, R.W., Kung, H.F., and Jin, D.Y. (2002) Cooperation of yeast peroxiredoxins Tsa1p and Tsa2p in the cellular defense against oxidative and nitrosative stress. *The Journal of Biological Chemistry*, 277, 5385–5394.
- Wong, E.D., Wagner, J.A., Scott, S.V. et al. (2003) The intramitochondrial dynamin-related GTPase, Mgm1p, is a component of a protein complex that mediates mitochondrial fusion. *The Journal of Cell Biology*, 160, 303–311.
- Wood, J.S. and Hartwell, L.H. (1982) A dependent pathway of gene functions leading to chromosome segregation in *Saccharomyces cerevisiae*. *The Journal of Cell Biology*, 94, 718–726.
- Wood, V., Gwilliam, R., Rajandream, M.A. et al. (2002) The genome sequence of *Schizosaccharomyces pombe*. *Nature*, 415, 871–880.
- Woolfit, M. and Wolfe, K.H. (2005) The gene duplication that greased society's wheels. *Nature Genetics*, 37, 566–567.
- Woolfit, M., Rozpedowska, E., Piskur, J., and Wolfe, K.H. (2007) Genome survey sequencing of the wine spoilage yeast *Dekkera (Brettanomyces) bruxellensis*. *Eukaryotic Cell*, 6, 721–733.
- Woolford, J.L.Jr, Hereford, L.M., and Rosbash, M. (1979) Isolation of cloned DNA sequences containing ribosomal protein genes from *Saccharomyces cerevisiae*. *Cell*, 18, 1247–1259.
- Wotton, D. and Shore, D. (1997) A novel Rap1p-interacting factor, Rif2p, cooperates with Rif1p to regulate telomere length in *Saccharomyces cerevisiae*. *Genes and Development*, 11, 748–760.
- Wotton, D., Freeman, K., and Shore, D. (1996) Multimerization of Hsp42p, a novel heat shock protein of *Saccharomyces cerevisiae*, is dependent on a conserved carboxyl-terminal sequence. *The Journal of Biological Chemistry*, 271, 2717–2723.
- Woychik, N.A. and Young, R.A. (1990) RNA polymerase II: subunit structure and function. *Trends in Biochemical Sciences*, 15, 347–351 (review).
- Woychik, N.A., Liao, S.M., Kolodziej, P.A., and Young, R.A. (1990) Subunits shared by eukaryotic nuclear RNA polymerases. *Genes and Development*, 4, 313–323.
- Wright, M.C. and Philippsen, P. (1991) Replicative transformation of the filamentous fungus *Ashbya gossypii* with plasmids containing *Saccharomyces cerevisiae* ARS elements. *Genetics*, 109, 99–105.
- Wu, M. and Gerhart, J.C. (1980) Partial purification and characterization of the maturation-promoting factor from eggs of *Xenopus laevis*. *Developmental Biology*, 79, 465–477.
- Wu, L. and Han, D.K. (2006) Overcoming the dynamic range problem in mass spectrometry-based shotgun proteomics. *Expert Reviews in Proteomics*, 3, 611–619.
- Wu, J., Suka, N., Carlson, M., and Grunstein, M. (2001) TUP1 utilizes histone H3/H2B-specific HDA1 deacetylase to repress gene activity in yeast. *Molecular Cell*, 7, 117–126.
- Wu, W.H., Alami, S., Luk, E. et al. (2005) Swc2 is a widely conserved H2AZ-binding module essential for ATP-dependent histone exchange. *Nature Structural & Molecular Biology*, 12, 1064–1071.
- Wu, C.H., Mulchandani, A., and Chen, W. (2008a) Versatile microbial surface-display for environmental remediation and biofuels production. *Trends in Microbiology*, 16, 181–188 (review).
- Wu, Q., James, S.A., Roberts, I.N., Moulton, V., and Huber, K.T. (2008b) Exploring contradictory phylogenetic relationships in yeasts. *FEMS Yeast Research*, 8, 641–650.
- Wu, C. (1997) Chromatin remodeling and the control of gene expression. *The Journal of Biological Chemistry*, 272, 28171–28174 (review).
- Wuarin, J. and Nurse, P. (1996) Regulating S phase: CDKs, licensing and proteolysis. *Cell*, 85, 785–787.
- Wullschleger, S., Loewith, R., Oppliger, W., and Hall, M.N. (2005) Molecular organization of target of rapamycin complex 2. *The Journal of Biological Chemistry*, 280, 30697–30704.
- Wurster, S.E. and Mahler, L.J.III (2010) Selections that optimize RNA display in the yeast three-hybrid system. *RNA (New York, NY)*, 16, 253–258.
- Wyce, A., Henry, K.W., and Berger, S.L. (2004) H2B ubiquitylation and de-ubiquitylation in gene activation. *Novartis Foundation Symposium*, 259, 63–73, discussion 73–77, 163–169.
- Wyce, A., Xiao, T., Whelan, K.A. et al. (2007) H2B ubiquitylation acts as a barrier to Ctk1 nucleosomal recruitment prior to removal by Ubp8 within a SAGA-related complex. *Molecular Cell*, 27, 275–288.
- Wyrick, J.J. and Young, R.A. (2002) Deciphering gene expression regulatory networks. *Current Opinion in Genetics & Development*, 12, 130–136 (review).
- Wyrick, J.J., Holstege, F.C., Jennings, E.G. et al. (1999) Chromosomal landscape of nucleosome-dependent gene expression and silencing in yeast. *Nature*, 402, 418–421.
- Xie, Y. and Varshavsky, A. (1999) The E2–E3 interaction in the N-end rule pathway: the RING-H2 finger of E3 is required for the synthesis of multiubiquitin chain. *The EMBO Journal*, 18, 6832–6844.
- Xie, Y. and Varshavsky, A. (2001) RPN4 is a ligand, substrate, and transcriptional regulator of the 26S proteasome: a negative feedback circuit. *Proceedings of the National Academy of Sciences of the United States of America*, 98, 3056–3061.
- Xie, W., Gai, X., Zhu, Y. et al. (2001) Targeting of the yeast Ty5 retrotransposon to silent chromatin is mediated by interactions between integrase and Sir4p. *Molecular and Cellular Biology*, 21, 6606–6614.
- Xin, H., Takahata, S., Blanksma, M., McCullough, L., Stillman, D.J., and Formosa, T. (2009) yFACT induces global accessibility of nucleosomal DNA without H2A–H2B displacement. *Molecular Cell*, 35, 365–376.
- Xing, F., Hiley, S.L., Hughes, T.R., and Phizicky, E.M. (2004) The specificities of four yeast dihydrouridine synthases for cytoplasmic tRNAs. *The Journal of Biological Chemistry*, 279, 17850–17860.
- Xu, X.M. and Müller, S.G. (2008) Iron–sulfur cluster biogenesis systems and their crosstalk. *ChemBioChem*, 9, 2355–2362.
- Xu, J., Saunders, C.W., Hu, P. et al. (2007) Dandruff-associated *Malassezia* genomes reveal convergent and divergent virulence traits shared with plant and human fungal pathogens. *Proceedings of the National Academy of Sciences of the United States of America*, 104, 18730–18735.
- Xu, X., Song, Y., Li, Y., Chang, J., Zhang, H., and An, L. (2010) The tandem affinity purification method: an efficient system for protein complex purification and protein interaction identification. *Protein Expression and Purification*, 72, 149–156 (review).
- Yamada, T., Okuhara, K., Iwamatsu, A. et al. (2000) p97 ATPase, an ATPase involved in membrane fusion, interacts with DNA unwinding factor (DUF) that functions in DNA replication. *FEBS Letters*, 466, 287–291.
- Yamamoto, A., DeWald, D.B., Boronenkov, I.V., Anderson, R.A., Emr, S.D., and Koshland, D. (1995) Novel PI4P 5-kinase homologue, Fab1p, essential for normal vacuole function and morphology in yeast. *Molecular Biology of the Cell*, 6, 525–539.
- Yamamoto, A., Guacci, V., and Koshland, D. (1996a) Pds1p is required for faithful execution of anaphase in the yeast, *Saccharomyces cerevisiae*. *The Journal of Cell Biology*, 133, 85–97.
- Yamamoto, A., Guacci, V., and Koshland, D. (1996b) Pds1p, an inhibitor of anaphase in budding yeast, plays a critical role in the APC and checkpoint pathway(s). *The Journal of Cell Biology*, 133, 99–110.
- Yamamoto, H., Esaki, M., Kanamori, T., Tamura, Y., Nishikawa, S., and Endo, T. (2002) Tim50 is a subunit of the TIM23 complex that links protein translocation across the outer and inner mitochondrial membranes. *Cell*, 111, 519–528.
- Yamane, T., Ogawa, T., and Matsuoka, M. (2008a) Derivation of consensus sequence for protein binding site in *Yarrowia lipolytica* centromere. *Journal of Bioscience and Bioengineering*, 105, 671–674.
- Yamane, T., Sakai, H., Nagahama, K., Ogawa, T., and Matsuoka, M. (2008b) Dissection of

- centromeric DNA from yeast *Yarrowia lipolytica* and identification of protein-binding site required for plasmid transmission. *Journal of Bioscience and Bioengineering*, **105**, 571–578.
- Yan, Y., Kohli, A., and Koffas, M.A.G. (2005) Biosynthesis of natural flavanones in *Saccharomyces cerevisiae*. *Applied and Environmental Microbiology*, **71**, 5610–5613.
- Yang, W. and Woodgate, R. (2007) What a difference a decade makes: insights into translesion DNA synthesis. *Proceedings of the National Academy of Sciences of the United States of America*, **104**, 15591–15598.
- Yang, M., Jensen, R.E., Yaffe, M.P., Oppliger, W., and Schatz, G. (1988) Import of proteins into yeast mitochondria: the purified matrix processing protease contains two subunits which are encoded by the nuclear *MAS1* and *MAS2* genes. *The EMBO Journal*, **7**, 3857–3862.
- Yang, M.J., Geli, V., Oppliger, W., Suda, K., James, P., and Schatz, G. (1991) The MAS-encoded processing protease of yeast mitochondria. Interaction of the purified enzyme with signal peptides and a purified precursor protein. *The Journal of Biological Chemistry*, **266**, 6416–6423.
- Yang, H., Ren, Q., and Zhang, Z. (2008) Cleavage of Mcd1 by caspase-like protease Esp1 promotes apoptosis in budding yeast. *Molecular Biology of the Cell*, **19**, 2127–2134.
- Yano, T., Takigami, E., Yurimoto, H., and Sakai, Y. (2009) Yap1-regulated glutathione redox system curtails accumulation of formaldehyde and reactive oxygen species in methanol metabolism of *Pichia pastoris*. *Eukaryotic Cell*, **8**, 540–549.
- Ye, Y., Meyer, H.H., and Rapoport, T.A. (2003) Function of the p97-Ufd1-Npl4 complex in retrotranslocation from the ER to the cytosol: dual recognition of nonubiquitinated polypeptide segments and polyubiquitin chains. *The Journal of Cell Biology*, **162**, 71–84.
- Yeh, E., Yang, C., Chin, E. et al. (2000) Dynamic positioning of mitotic spindles in yeast: role of microtubule motors and cortical determinants. *Molecular Biology of the Cell*, **11**, 3949–3961.
- Yen, W.L., Legakis, J.E., Nair, U., and Klionsky, D.J. (2007) Atg27 is required for autophagy-dependent cycling of Atg9. *Molecular Biology of the Cell*, **18**, 581–593.
- Yeong, F.M., Lim, H.H., Padmashree, C.G., and Surana, U. (2000) Exit from mitosis in budding yeast: biphasic inactivation of the Cdc28-Clb2 mitotic kinase and the role of Cdc20. *Molecular Cell*, **5**, 501–511.
- Yeung, T., Barlowe, C., and Schekman, R. (1995) Uncoupled packaging of targeting and cargo molecules during transport vesicle budding from the endoplasmic reticulum. *The Journal of Biological Chemistry*, **270**, 30567–30570.
- Yin, Q.Y., de Groot, P.W., Dekker, H.J., de Jong, L., Klis, F.M., and de Koster, C.G. (2005) Comprehensive proteomic analysis of *Saccharomyces cerevisiae* cell walls: identification of proteins covalently attached via glycosylphosphatidylinositol remnants or mild alkali-sensitive linkages. *The Journal of Biological Chemistry*, **280**, 20894–20901.
- Yokomori, K., Zeidler, M.P., Chen, J.L., Verrijzer, C.P., Mlodzik, M., and Tjian, R. (1994) *Drosophila* TFIIA directs cooperative DNA binding with TBP and mediates transcriptional activation. *Genes and Development*, **8**, 2313–2323.
- York, J.D. (2006) Regulation of nuclear processes by inositol polyphosphates. *Biochimica et Biophysica Acta*, **1761**, 552–559.
- Yoshihisa, T., Yunoki-Esaki, K., Ohshima, C., Tanaka, N., and Endo, T. (2003) Possibility of cytoplasmic pre-tRNA splicing: the yeast tRNA splicing endonuclease mainly localizes on the mitochondria. *Molecular Biology of the Cell*, **14**, 3266–3279.
- Youn, J.K., Shang, L., Kim, M.I. et al. (2010) Enhanced production of human serum albumin by fed-batch culture of *Hansenula polymorpha* with high-purity oxygen. *Journal of Microbiology and Biotechnology*, **20**, 1534–1538.
- Young, R.A. and Davis, R.W. (1983) Yeast RNA polymerase II genes: isolation with antibody probes. *Science*, **222**, 778–782.
- Young, P., Deveraux, Q., Beal, R.E., Pickart, C.M., and Rechsteiner, M. (1998) Characterization of two polyubiquitin binding sites in the 26S protease subunit 5a. *The Journal of Biological Chemistry*, **273**, 5461–5467.
- Young, L., Leonhard, K., Tatsuta, T., Trowsdale, J., and Langer, T. (2001) Role of the ABC transporter Mdl1 in peptide export from mitochondria. *Science*, **291**, 2135–2138.
- Young, J.C., Agashe, V.R., Siegers, K., and Hartl, F.U. (2004) Pathways of chaperone-mediated protein folding in the cytosol. *Nature Reviews Molecular Cell Biology*, **5**, 781–791.
- Young, E., Poucher, A., Comer, A., Bailey, A., and Alper, H. (2011) Functional survey for heterologous sugar transport proteins, using *Saccharomyces cerevisiae* as a host. *Applied and Environmental Microbiology*, **77**, 3311–3319.
- Young, R.A. (2001) Remodeling of yeast genome expression in response to environmental changes. *Molecular Biology of the Cell*, **12**, 323–337.
- Youngren, S.D., Boeke, J.D., Sanders, N.J., and Garfinkel, D.J. (1988) Functional organization of the retrotransposon Ty from *Saccharomyces cerevisiae*: Ty protease is required for transposition. *Molecular and Cellular Biology*, **8**, 1421–1431.
- Yu, H.G. and Koshland, D.E. (2003) Meiotic condensin is required for proper chromosome compaction, SC assembly, and resolution of recombination-dependent chromosome linkages. *The Journal of Cell Biology*, **163**, 937–947.
- Yu, H.G. and Koshland, D. (2005) Chromosome morphogenesis: condensin-dependent cohesin removal during meiosis. *Cell*, **123**, 397–407.
- Yu, J.W. and Lemmon, M.A. (2001) All phox homology (PX) domains from *Saccharomyces cerevisiae* specifically recognize phosphatidylinositol 3-phosphate. *The Journal of Biological Chemistry*, **276**, 44179–44184.
- Yu, H., Braun, P., Yildirim, M.A. et al. (2008a) High-quality binary protein interaction map of the yeast interactome network. *Science*, **322**, 104–110.
- Yu, R.C., Resnekov, O., Abola, A.P. et al. (2008b) The Alpha Project, a model system for systems biology research. *IET Systems Biology*, **2**, 222–233.
- Yuan, H., Michelsen, K., and Schwappach, B. (2003) 14-3-3 dimers probe the assembly status of multimeric membrane proteins. *Current Biology*, **13**, 638–646.
- Yuen, K.W., Warren, C.D., Chen, O. et al. (2007) Systematic genome instability screens in yeast and their potential relevance to cancer. *Proceedings of the National Academy of Sciences of the United States of America*, **104**, 3925–3930.
- Yukawa, M., Katoh, S., Miyakawa, T., and Tsuchiya, E. (1999) Nps1/Sth1p, a component of an essential chromatin-remodeling complex of *Saccharomyces cerevisiae*, is required for the maximal expression of early meiotic genes. *Genes to Cells*, **4**, 99–110.
- Yun, C.W., Bauler, M., Moore, R.E., Klebba, P.E., and Philpott, C.C. (2001) The role of the FRE family of plasma membrane reductases in the uptake of siderophore iron in *Saccharomyces cerevisiae*. *Journal of Biological Chemistry*, **276**, 10218–10233.
- Yurimoto, H., Oku, M., and Sakai, K. (2011) Yeast methylotrophy, metabolism, gene regulation and peroxisome homeostasis. *International Journal of Microbiology*, 101298.
- Zaborske, J. and Pan, T. (2010) Genome-wide analysis of aminoacylation (charging) levels of tRNA using microarrays. *Journal of Visualized Experiments*, **40**, pii:2007.
- Zachariae, W. and Nasmyth, K. (1999) Whose end is destruction: cell division and the anaphase-promoting complex. *Genes and Development*, **13**, 2039–2058.
- Zachariae, W., Kuger, P., and Breunig, K.D. (1993) Glucose repression of lactose galactose metabolism in *Kluyveromyces fragilis* is determined by the concentration of the transcriptional activator La1c9 (K1gal4). *Nucleic Acids Research*, **21**, 69–77.
- Zachariae, W., Shin, T.H., Galova, M., Obermaier, B., and Nasmyth, K. (1996) Identification of subunits of the anaphase-promoting complex of *Saccharomyces cerevisiae*. *Science*, **274**, 1201–1204.
- Zachariae, W., Schwab, M., Nasmyth, K., and Seufert, W. (1998) Control of cyclin ubiquitination by CDK-regulated binding of Hct1 to the anaphase promoting complex. *Science*, **282**, 1721–1724.
- Zachau, H.G., Acs, G., and Lipmann, F. (1958) Isolation of adenosine amino acid esters from a ribonuclease digest of soluble liver ribonucleic acid. *Proceedings of the National Academy of Sciences of the United States of America*, **44**, 885–889.
- Zachau, H.G., Dütting, D., and Feldmann, H. (1966a) Nucleotidsequenz zweier serinspezifischer Transfer-Ribonukleinsäuren. *Angewandte Chemie (International Edition in English)*, **78**, 392–393.
- Zachau, H.G., Dütting, D., Feldmann, H., Melchers, F., and Karau, W. (1966b) Serine specific tRNAs. XIV. Comparison of nucleotide sequences and secondary structure models. *Cold Spring Harbor Symposia on Quantitative Biology*, **31**, 417–424.
- Zahedi, R.P., Sickmann, A., Boehm, A.M. et al. (2006) Proteomic analysis of the yeast mitochondrial outer membrane reveals accumulation of a subclass of preproteins. *Molecular Biology of the Cell*, **17**, 1436–1450.

- Zahner, J.E., Harkins, H.A., and Pringle, J.R. (1996) Genetic analysis of the bipolar pattern of bud site selection in the yeast *Saccharomyces cerevisiae*. *Molecular and Cellular Biology*, **16**, 1857–1870.
- Zaidi, I.W., Rabut, G., Poveda, A. *et al.* (2008) Rtt101 and Mms1 in budding yeast form a CUL4(DDB1)-like ubiquitin ligase that promotes replication through damaged DNA. *EMBO Reports*, **9**, 1034–1040.
- Zakian, V.A. (1996a) Structure, function, and replication of *Saccharomyces cerevisiae* telomeres. *Annual Review of Genetics*, **30**, 141–172 (review).
- Zakian, V.A. (1996b) Telomere functions: lessons from yeast. *Trends in Cell Biology*, **6**, 29–33.
- Zaman, Z., Ansari, A.Z., Gaudreau, L., Nevado, J., and Ptashne, M. (1998) Gene transcription by recruitment. *Cold Spring Harbor Symposia on Quantitative Biology*, **63**, 167–171 (review).
- Zegerman, P. and Diffley, J.F. (2007) Phosphorylation of Sld2 and Sld3 by cyclin-dependent kinases promotes DNA replication in budding yeast. *Nature*, **445**, 281–285.
- Zeitlinger, J., Simon, I., Harbison, C.T. *et al.* (2003) Program-specific distribution of a transcription factor dependent on partner transcription factor and MAPK signaling. *Cell*, **113**, 395–404.
- Zenke, F.T., Engels, R., Vollenbroich, V., Meyer, J., Hollenberg, C.P., and Breunig, K.D. (1996) Activation of Gal4p by galactose-dependent interaction of galactokinase and Gal80p. *Science*, **272**, 1662–1665.
- Zennaro, E., Francisci, S., Ragnini, A., Frontali, L., and Bolotin-Fukuhara, M. (1989) A point mutation in a mitochondrial tRNA gene abolishes its 3' end processing. *Nucleic Acids Research*, **17**, 5751–5764.
- Zeyl, C. (2009) The role of sex in fungal evolution. *Current Opinion in Microbiology*, **12**, 592–598.
- Zhang, Z., and Kishino, H. (2004) Genomic background predicts the fate of duplicated genes, evidence from the yeast genome. *Genetics*, **166**, 1995–1999.
- Zhang, J.W. and Lazarow, P.B. (1995) *PEB1 (PAS7)* in *Saccharomyces cerevisiae* encodes a hydrophilic, intra-peroxisomal protein that is a member of the WD repeat family and is essential for the import of thiolase into peroxisomes. *The Journal of Cell Biology*, **129**, 65–80.
- Zhang, J.W., Ham, Y., and Lazarow, P.B. (1993) Novel peroxisome clustering mutants and peroxisome biogenesis mutants of *Saccharomyces cerevisiae*. *The Journal of Cell Biology*, **123**, 1133–1147.
- Zhang, S., Guha, S., and Volkert, F.C. (1995) The *Saccharomyces SHP1* gene, which encodes a regulator of phosphoprotein phosphatase 1 with differential effects on glycogen metabolism, meiotic differentiation, and mitotic cell cycle progression. *Molecular and Cellular Biology*, **15**, 2037–2050.
- Zhang, Z., Varanasi, U., and Trumbly, R.J. (2002) Functional dissection of the global repressor Tup1 in yeast: dominant role of the C-terminal repression domain. *Genetics*, **161**, 957–969.
- Zhang, H., Richardson, D.O., Roberts, D.N. *et al.* (2004) The Yaf9 component of the SWR1 and NuA4 complexes is required for proper gene expression, histone H4 acetylation, and Htz1 replacement near telomeres. *Molecular and Cellular Biology*, **24**, 9424–9436.
- Zhang, Z., Ren, Q., Yang, H. *et al.* (2005) Budding yeast PDS5 plays an important role in meiosis and is required for sister chromatid cohesion. *Molecular Microbiology*, **56**, 670–680.
- Zhang, Y., Sikes, M.L., Beyer, A.L., and Schneider, D.A. (2009) The Paf1 complex is required for efficient transcription elongation by RNA polymerase I. *Proceedings of the National Academy of Sciences of the United States of America*, **106**, 2153–2158.
- Zhang, H., Skelton, A., Gardner, R.C., and Goddard, M.R. (2010a) *Saccharomyces paradoxus* and *Saccharomyces cerevisiae* reside on oak trees in New Zealand: evidence for migration from Europe and interspecies hybrids. *FEMS Yeast Research*, **10**, 941–947.
- Zhang, L.Y., Yang, Y.F., and Niu, D.K. (2010b) Evaluation of models of the mechanisms underlying intron loss and gain in *Aspergillus* fungi. *Journal of Molecular Evolution*, **71**, 364–373.
- Zhao, X. and Blobel, G. (2005) A SUMO ligase is part of a nuclear multiprotein complex that affects DNA repair and chromosomal organization. *Proceedings of the National Academy of Sciences of the United States of America*, **102**, 9086–9090.
- Zhao, X., Lasell, T.K., and Melançon, P. (2002) Localization of large ADP-ribosylation factor-guanine nucleotide exchange factors to different Golgi compartments: evidence for distinct functions in protein traffic. *Molecular Biology of the Cell*, **13**, 119–133.
- Zhao, Y., Sohn, J.H., and Warner, J.R. (2003) Autoregulation in the biosynthesis of ribosomes. *Molecular and Cellular Biology*, **23**, 699–707.
- Zhao, R., Davey, M., Hsu, Y.C. *et al.* (2005) Navigating the chaperone network: an integrative map of physical and genetic interactions mediated by the hsp90 chaperone. *Cell*, **120**, 715–727.
- Zhao, X., Claude, A., Chun, J., Shields, D.J., Presley, J.F., Melançon, P. (2006) GBF1, a cis-Golgi and VTCs-localized ARF-GEF, is implicated in ER-to-Golgi protein traffic. *Journal of Cell Science*, **119**, 3743–3753.
- Zhdankina, O., Strand, N.L., Redmond, J.M., and Boman, A.L. (2001) Yeast GGA proteins interact with GTP-bound Arf and facilitate transport through the Golgi. *Yeast (Chichester, England)*, **18**, 1–18.
- Zheng, L. and Shen, B. (2011) Okazaki fragment maturation: nucleases take centre stage. *Journal of Molecular Cell Biology*, **3**, 23–30.
- Zhou, J., Monson, E.K., Teng, S.C., Schulz, V.P., and Zakian, V.A. (2000) Pif1p helicase, a catalytic inhibitor of telomerase in yeast. *Science*, **289**, 771–774.
- Zhu, G., Spellman, P.T., Volpe, T. *et al.* (2000) Two yeast forkhead genes regulate the cell cycle and pseudohyphal growth. *Nature*, **406**, 90–94.
- Zhu, H., Bilgin, M., Bangham, R. *et al.* (2001) Global analysis of protein activities using proteome chips. *Science*, **293**, 2101–2105.
- Zhu, H., Bilgin, M., and Snyder, M. (2003a) Proteomics. *Annual Review of Biochemistry*, **72**, 783–812.
- Zhu, Y., Dai, J., Fuerst, P.G., and Voytas, D.F. (2003b) Controlling integration specificity of a yeast retrotransposon. *Proceedings of the National Academy of Sciences of the United States of America*, **100**, 5891–5895.
- Zhu, X., Gerstein, M., and Snyder, M. (2006) ProCAT, a data analysis approach for protein microarrays. *Genome Biology*, **7**, R110.
- Zhu, C., Byers, K.J.R.P., McCord, R.P. *et al.* (2009) High-resolution DNA-binding specificity analysis of yeast transcription factors. *Genome Research*, **19**, 556–566.
- Zich, J. and Hardwick, K.G. (2010) Getting down to the phosphorylated “nuts and bolts” of spindle checkpoint signalling. *Trends in Biochemical Sciences*, **35**, 18–27.
- Zickermann, V., Kerscher, S., Zwicker, K., Tocilescu, M.A., Radermacher, M., and Brandt, U. (2009) Architecture of complex I and its implications for electron transfer and proton pumping. *Biochimica et Biophysica Acta*, **1787**, 574–583.
- Ziman, M., Preuss, D., Mulholland, J., O'Brien, J.M., Botstein, D., and Johnson, D.I. (1993) Subcellular localization of Cdc42p, a *Saccharomyces cerevisiae* GTP-binding protein involved in the control of cell polarity. *Molecular Biology of the Cell*, **4**, 1307–1316.
- Ziman, M., Chuang, J.S., and Schekman, R.W. (1996) Chs1p and Chs3p, two proteins involved in chitin synthesis, populate a compartment of the *Saccharomyces cerevisiae* endocytic pathway. *Molecular Biology of the Cell*, **7**, 1909–1919.
- Zimniak, P., Hartter, E., Woloszczuk, W., and Ruis, H. (1976) Catalase biosynthesis in yeast: formation of catalase A and catalase T during oxygen adaptation of *Saccharomyces cerevisiae*. *European Journal of Biochemistry*, **71**, 393–398.
- Zinn, A.R. and Butow, R.A. (1985) Non-reciprocal exchange between alleles of the yeast mitochondrial 21S rRNA gene: kinetics and the involvement of a double-strand break. *Cell*, **40**, 887–895.
- Zitomer, R.S., Montgomery, D.L., Nichols, D.L., and Hall, B.D. (1979) Transcriptional regulation of the yeast cytochrome *c* gene. *Proceedings of the National Academy of Sciences of the United States of America*, **76**, 3627–3631.
- Zlatanova, J., Seebart, C., and Tomschik, M. (2008) The linker-protein network: control of nucleosomal DNA accessibility. *Trends in Biochemical Sciences*, **33**, 247–253.
- Zou, L. and Stillman, B. (2000) Assembly of a complex containing Cdc45p, replication protein A, and Mcm2p at replication origins controlled by S-phase cyclin-dependent kinases and Cdc7p–Dbf4p kinase. *Molecular and Cellular Biology*, **20**, 3086–3096.
- Zou, S. and Voytas, D.F. (1997) Silent chromatin determines target preference of the *Saccharomyces* retrotransposon Ty5. *Proceedings of the National Academy of Sciences of the United States of America*, **94**, 7412–7416.
- Zou, S., Wright, D.A., and Voytas, D.F. (1995) The *Saccharomyces* Ty5 retrotransposon family is associated with origins of DNA replication at the telomeres and the silent mating locus

- HMR. *Proceedings of the National Academy of Sciences of the United States of America*, **92**, 920–904.
- Zou, L., Mitchell, J., and Stillman, B. (1997) CDC45, a novel yeast gene that functions with the origin recognition complex and Mcm proteins in initiation of DNA replication. *Molecular and Cellular Biology*, **17**, 553–563.
- Zuo, Y. and Deutscher, M.P. (2001) Exoribonuclease superfamilies: structural analysis and phylogenetic distribution. *Nucleic Acids Research*, **29**, 1017–1026.
- Zurita-Martinez, S.A., Puria, R., Pan, X., Boeke, J.D., and Cardenas, M.E. (2007) Efficient Tor signaling requires a functional class C Vps protein complex in *Saccharomyces cerevisiae*. *Genetics*, **176**, 2139–2150.
- Zvyagilskaya, R.A., Lundh, F., Samyn, D. *et al.* (2008) Characterization of the Pho89 phosphate transporter by functional hyperexpression in *Saccharomyces cerevisiae*. *FEMS Yeast Research*, **8**, 685–696.