

Index

a

ABC transporters 701
 acinar adenocarcinoma 660
 actin 275
 activated cytoplasts, nuclear transfer into 318
 activated protein 105
 acute lung injury 445
 acute lymphoblastic leukemia 638
 acute lymphoid leukemia 523
 acute myeloid leukemia 522, 605, 637, 699
 acute myocarditis 446
 acute T-cell lymphoblastic leukemia 539
 ADA transgene 407
 adaptive immune response 442
 adenoassociated viruses 161
 adenocarcinoma 660
 adenoma 532, 606
 adenomatous polyposis coli 529, 606, 633
 adenosine deaminase 402
 adenoviral vectors 52
 adherens junction genes 607
 adherent monolayer culture 549
 adhesion culture 85
 adipoblast 69
 adipocyte 67, 438
 adipogenesis 289
 adipose tissue 695
 adipose-derived stem cells 352
 adjuvant 737
 adjuvant therapy 542, 737
 adrenergic nerve fibers 435
 β 1-adrenergic stimulation 182
 adrenergic transplants 480
 adult clone phenotypes 324
 adult stem cell 65
 age-associated anemia 690
 aged fertilization failure 240
 aggregation 161
 aging 689

aging process 122
 aging program 678
 akinesia 473
 AKT inhibitor 545
 AKT pathway 612
 alcoholic sclerosis 88
 aldehyde dehydrogenase 524, 607, 641
 alkaline phosphatase 264
 allogeneic 394
 allogeneic stem cell transplant 408
 allogeneic transplant 86, 406, 411, 703
 allosteric inhibitor 545
 Alzheimer disease 87, 540
 amniotic fluid 433
 amniotic fluid-derived cells 352
 AMP-activated protein kinase 128
 amplification 281
 amyloid precursor protein 540
 amyotrophic lateral sclerosis 53, 85, 588
 androgen deprivation 660
 androgen receptor 658
 androgen replacement 660
 androgen stimulation 660
 androgen supplementation 661
 androgen-regulated homeobox transcription factor 663
 androgenetic embryos 259
 anemia 417
 aneuploidy 260, 584
 angiogenesis 283, 379, 617, 739
 animal cloning 300. *See also* nuclear transfer, for cloning animals
 animal models 444
 anti-angiogenesis therapy 549
 anti-apoptotic effects 455
 anti-apoptotic signaling 446
 anti-cancer molecule 454
 anti-differentiation factor 83

- anti-inflammatory effects 441
 anti-inflammatory machinery 455
 anti-sickling effect 418
 anti-tumor medications 702
 anti-angiogenetic therapy 739
 anti-apoptotic molecules 743
 antibodies 743
 antibody-based strategy 586
 antibody-producing cells 443
 antibody-dependent cell-mediated cytotoxicity 740
 antibody-dependent direct cytotoxicity 642
 antigens 362
 antiproliferative properties 442
 antiserum 579
 apomorphine 479
 apoptosis 105, 106, 506, 540, 632, 669, 682, 687, 729
 apoptosis pathways 549
 apoptotic hepatocytes 445
 apoptotic stimuli 434
 arrhythmia 197
 arrhythmogenic potential 451
 arthritis 88
 articular cartilage 433
 artificial oocytes 241
 asexual reproduction 258
 asthma 88
 astrocytes 694
 asymmetric cell division 281, 285, 608
 asymmetric division 679, 685, 690
 atherosclerosis 88
 ATP binding cassette transporter 524
 atrial myosin heavy chain-1 378
 atrioventricular block 197
ATRX gene 22–23
 autocrine/paracrine stimulation 639
 autoimmune disease 88, 443, 592
 autoimmune reactions 410
 autologous cell transplantation 590, 591
 autosomal recessive mutations 406
 autosomal tyrosinase allele 262
 axon growth 506
- b**
- B-cell function 443
 B-cell specific transcription factor 541
 bacterial artificial chromosome 161, 593
BAF47 gene 17
BAF155 gene 17
 basal cell carcinoma 536, 640
 basal cells 659
 basal forebrain 473
 basal lamina 284
 basement membrane 276, 282, 658
 battlefield-type wounds 88
 BCR-ABL 354
 behavioral deficits 480
 bevacizumab 549, 740
 biliary system 398
 biological clock 89
 biological pacemakers 197
 biological screens 493
 biomedicine 259
 bioreactor 86, 191
 bladder cancer 548, 642
 blastocyst 42, 154, 211, 246, 259, 579, 582
 blastocyst-stage embryos 485
 blastomere 45, 154, 261, 311
 blastomere-like stem cell 65
 bleeding 394, 540
 blood cell disease 394
 blood cell lineages 407
 blood cells 394
 blood vessel formation 195
 blood–brain barrier 476, 505
 bloodstream 82
 bone 67
 bone defects 438
 bone healing 445
 bone marrow 77, 127, 353, 356, 396, 398, 546, 679
 bone marrow cells 352, 416
 bone marrow stromal cell 508
 bone marrow transplantation 88, 394, 588, 629
 bone marrow-derived stem cells 280
 bone morphogenetic protein 104, 180, 541, 607, 735
 bone morphogenetic protein 375, 488, 587
 brachyury T 377
 bradykinesia 473
 brain cancer 700
 brain damage 89
 brain stem cell 103
 brain tumor 547
 brain tumor stem cells 606
 brain-derived neurotrophic factor 288, 447, 473
 BrdU 122
 BrdU uptake 664
 breast cancer 452, 523, 607, 638, 700
Brg gene 17
 5'-bromo-deoxyuridine 661
 bulk-replicating cancer cells 700
 bundle branch conduction system 182
 busulfan 407

- c**
- c-kit 106
 - c-kit antibodies 109
 - cadherin-mediated cell adhesion junctions 684
 - caloric restriction 693
 - canalization 659
 - cancer 128, 522, 592
 - cancer cell lines 541
 - cancer cells 577, 637, 657
 - cancer initiation 704
 - cancer metastasis 705
 - cancer staging 736
 - cancer stem cell 128, 522, 605, 637, 696
 - cancer therapy 545, 638
 - cancer-associated fibroblast 669
 - cancer-initiating cell 696
 - cancer-testis antigen 109
 - canonical HSC niche 123
 - canonical niche cell 686
 - capillaries 77
 - carcinoembryonic antigen-cell adhesion molecule-1 77
 - carcinogenesis 700
 - carcinoma 666
 - carcinoma-associated fibroblast 702
 - cardiac cell therapy 382
 - cardiac cells 588
 - cardiac conduction 181
 - cardiac function 179
 - cardiac hypertrophy 200, 380
 - cardiac lineage 185
 - cardiac physiology 197
 - cardiac progenitor cell 194, 373
 - cardiac regenerative medicine 373
 - cardiac remodeling 194
 - cardiac stem cell 381, 446
 - cardiac therapy 451
 - cardiac tissue 181, 373
 - cardiogenesis 373, 376
 - cardiogenic cascade 374
 - cardiogenic field 375
 - cardiogenic growth factors 440
 - cardiomyocyte differentiation 588
 - cardiomyocyte subtypes 201
 - cardiomyocytes 55, 179, 183, 440, 588, 728
 - cardiomyogenesis 185, 187
 - cardiomyogenic differentiation 195, 440
 - cardioprotection 446
 - cardioprotective factors 195
 - cardiotoxic profile 199
 - cardiotoxic risk 198
 - cardiotoxicity 199
 - cardiotoxin injury 281
 - cardiovascular disease 374
 - cardiovascular progenitors 185
 - cardiovascular stem/progenitor cells 374
 - cartilage 67, 215
 - cartilage injury 438
 - cartilaginous tissue 87
 - castration-resistant prostate cancer 661
 - catechol-O-methyl transferase 476
 - β -catenin 124, 529, 633, 743
 - CD34 278
 - CD44 expression 525
 - CDK inhibitors 695
 - Cdx2* gene 14
 - cediranib 549
 - cell adhesion molecules 437
 - cell clusters 190, 191
 - cell culture 258
 - cell cycle 121, 211, 548
 - coordination to maintain normal ploidy 316–318
 - coordination to promote reprogramming 318
 - donor 316
 - inhibitors 695
 - cell density 438
 - cell differentiation 154, 180, 685, 735
 - cell division 81, 679, 682
 - cell fate 382
 - cell fusion 217, 235, 454
 - cell labeling 662
 - cell lineages 576
 - cell membrane 684
 - cell migration 377, 525
 - cell morphology 668
 - cell polarity 529
 - cell proliferation 105, 106, 280, 482, 525, 729
 - cell surface markers 215
 - cell therapy 165
 - cell transplantation 290, 507
 - cell-autonomous changes 690
 - cell-based screening strategies 551
 - cell-cycle arrest 693
 - cell-cycle regulator 380, 537, 681
 - cell-of-origin 665
 - cell-surface marker 69, 381, 608, 657
 - cell–cell contact 442, 444, 547, 669
 - cell–cell interactions 438, 495
 - cell–cell signaling 547
 - cell-cycle progression 639
 - cell-surface markers 352
 - cell-surface phenotypes 638
 - cellular metabolism 128
 - cellular neurobiology 494
 - cellular neuronal plasticity 479
 - central nervous system 87, 447, 479, 505, 524
 - cerebral palsy 87

- cervix 539
 cetuximab 740
 “chaperone” effects 483
Chd1 gene 17
 chelation therapy 416
 chemically assisted enucleation 321
 chemoattractant 687, 705
 chemoattractive signaling 690
 chemokine receptor 443, 667
 chemokines 591, 687, 705
 chemotaxis 410
 chemotherapeutic agents 397, 707
 chemotherapeutics 641
 chemotherapy 111, 405, 415, 454, 522, 700
 chimera 264
 chimeric animals 580
 chimeric mice 243
 chondroblasts 69
 chondrocytes 87
 chondrogenesis 438
 chondrogenic differentiation 436
 chordin 376
 chromatin 161, 216
 chromatin higher-order structure 16–18
 chromatin immunoprecipitation 50
 chromatin remodeling 236, 693
 chromatin status 50
 chromatin structure 362
 chromosomal abnormalities 44
 chromosomal DNA 403
 chromosomal ends 693
 chromosomal insertion 52
 chromosomal integration site 409, 417
 chromosomal telomeres 211
 chromosome 257, 262, 351, 401, 545
 chronic granulomatous disease 402, 411
 chronic heart disease 190
 chronic inflammatory demyelinating
 polyneuropathy 89
 chronic myelogenous leukemia 637
 chronic myeloid leukemia 259, 523, 698
 chronic obstructive pulmonary disease 89
 chronotropic compounds 199
 ciliary neurotrophic factor 447
 circulating tumor cell 609
 claudin 3 607
 cleavage-stage embryos 579
 clinical trials 382, 400, 450, 481, 513, 591
 clonal analysis 375
 clonal cultures 578
 clonal evolution hypothesis 729
 clonal expansion 584
 clonal growth 260
 cloned embryo 221, 224
 – *in vitro* culture of 322–323
 – transfer of 323
 cloned offspring 215
 clones 433
 cloning 169, 212
 cloning efficiency 237, 300, 311–314, 319, 333
 clonogenic analysis 65
 clonogenic potential 667
 clonogenic properties 591
 collagen 284
 collagenase 83
 colon cancer 532, 700
 colonic stem cell 731
 colony-forming unit-fibroblasts 591
 colorectal cancer 532
 colorectal cancer stem cell 732
 combinatorial marker profiling 663
 commitment marker 280
 committed myeloid progenitors 698
 common lymphoid progenitor 630
 common myeloid progenitor 630, 698
 compact bone 433
 complement fixation 740
 compound blastocysts 157
 conduction system 378
 conduction velocity 190
 congenital disease 169
 congenital heart disease 181, 374
 congenital long-QT syndrome 201
 connective tissue 81
 connexin-43 188
 continuous dopamine stimulation 477
 contractile forces 446
 contractility 382
 copy number 551
 copy number variation 362, 584
 cord blood 347, 550
 cord blood cells 50
 coronary smooth muscle cells 380
 coronary vasculature 379
 CpG islands 306
 Cre-LoxP excision system 351
 Crohn’s disease 451
 cross-correction 419
 cryoinfarction 194
 cryopreservation 69
 cryoprotection 224
 crystal study 740
 CSC genes 667
 CSC paradigm 670
 culture conditions 436
 culture environment 290
 culture period 240
 cultured cells 284

- cultured genomes 268
 cumulus cells 212
 CXC chemokine ligand 435
 cyclin-dependent kinase 49, 126
 cyclopamine 536
 cyclophosphamide 524
 cystic fibrosis 53
 cytogenetic analyses 265
 cytokine secretion 215
 cytokines 185, 288, 591, 687, 705
 cytokinesis 217, 235
 cytomorphologic features 609
 cytoplasm 276, 422, 541
 cytoplasmic β -catenin complexes 610
 cytoplasm 300, 316–318
 cytotoxic activity 552
 cytotoxicity 422, 442, 542
- d**
- DA phenotype 483
 daughter cells 658, 665
 daunorubicin 524
 decorin 289
 dedifferentiation 276
 deep sequencing 50
 deep-brain stimulation 477
 Delta/Notch signaling 286
 dementia 87, 88
 demographic changes 475
 dendrites 512
 dendritic cells 442, 546
de novo methyltransferases 7
 dental pulp 51, 433
 depression 474
 deregulation 611
 dermis 77
 Desert Hedgehog 534
 desmin 278
 desmosomes 197
 developmental biology 166
 dexamethasone 542
 diabetes 445, 451
 diabetes mellitus 88
 diarrhea 540
Dicer1 703
 dickkopf 439, 530
 differentiated cells 101
 differentiated germ cells 312
 differentiation 106, 161, 179, 212, 431, 633, 743
 differentiation blockage 681
 differentiation inhibitor 70
 differentiation potential 55, 355, 666
 differentiation process 99
 differentiation program 743
 differentiation protocols 491, 585, 587
 diploid 257
 diploid ES cells 260
 diploidization 260, 264
 diploidy 584
 direct lineage conversion 589
 direct reprogramming 382
 directional differentiation 576
 disease modeling 587, 593
 disease phenotype 54, 410
 disease progression 525, 658, 704
 disease-specific iPSCs 54
 disease-specific phenotypes 53
 dispase 83
 DNA damage 541, 682
 DNA damage checkpoint responses 701
 DNA demethylating 217
 DNA fragmentation 196
 DNA lesions 692
 DNA methylation 4, 7–11, 211, 235, 305–307, 362, 585, 643
 DNA methyltransferase (DNMT) 305
 DNA microarray profiles 220
 DNA polymerase 545
 DNA repair 615, 692
 DNA replication 236
 DNA synthesis 105
 DNA-binding protein 611
 DNaseI 417
 dominant clone 417
 donor cell-derived leukemia 702
 donor genome 244
 donor nucleus 247
 donor T cells 398
 dopamine replacement 476
 dopaminergic 473
 dopaminergic neurons 73, 221, 588
 dormancy 121
 double-strand break 593
 double-stranded DNA 420
 double-transgenic mouse 381
 downstream target 670
Drosophila 104
 drug resistance 696
 drug toxicity testing 199
 drug transporter protein 641
 drug-screening 587
 drug-sensitizing enzymes 586
 Duchenne muscular dystrophy 287, 447
 ductal carcinoma 539
 dynamic trafficking 684
 dyskeratosis congenita 546
 dysmorphic syndromes 182

- dystonia 477
dystrophic mice 280
- e**
E-cadherin 550, 607, 685
E-selectin 435
EBV-episomal system 358
ectoderm 346, 582
effector cells 444
electrocardiogram 198
electrophysiological properties 188
electroporation 422
embryo 43, 156, 179, 187, 211, 258, 374, 509
embryoid body 99, 161, 180, 488, 578
embryoid body cells 577
embryological development 487
embryological studies 479
embryology 373
embryonal carcinoma 577
embryonal development 578
embryonic antigens 487
embryonic carcinoma 43
embryonic defect 536
embryonic development 180, 539
embryonic fibroblasts 55, 582
embryonic genes 69
embryonic germ cells (EGCs) 25, 582
embryonic germ layer 67
embryonic patterning 182
embryonic stem cells (ESCs) 4, 5, 6, 156, 582, 301, 311–312
– epigenetic interconversion among mouse ESCs, EpiSCs, and human ESCs 24–26
– pluripotency regulation and miRNA differentiation 19–21
– stability, and imprinting 23–24
– telomere function and genomic stability in 21–22
embryonic tissue 696
emphysema 88
end-systolic volume 382
endangered species and companion animals and nuclear transfer 330–331
endocardium 375
endoderm 180, 346, 582
endogenous pool 576
endomitosis 264
endosteal niche 434, 703
endothelial nitric oxide synthase 357
endothelial progenitor cell 356
endothelial progenitors 357, 640
engraftment 196, 663
enhancer elements 404
enrichment 192
enucleation 320–321
enucleation timing 217, 235
enzyme replacement therapy 406
epiblast 44
epiblast-like stem cell 65
epicardium 375
epidermal growth factor 482, 633
epidermal homeostasis 617
epidermal repair 215
epidermal squamous cell carcinoma 638
epigenetic alteration 362
epigenetic defects 220, 239
epigenetic distance 494
epigenetic elements 43
epigenetic error 217
epigenetic events 6
epigenetic memory 361, 362, 583
epigenetic modification 216, 235, 541, 691
epigenetic therapy 643
epigenetically modified cell source 486
epigenetics 4, 301, 305
– differences between donor cells 310–314
– interconversion among mouse ESCs, EpiSCs, and human ESCs 24–26
epilepsy 483
epimorphosis 577
episomal system 357
episomal vectors 52, 355
epithelial cell adhesion molecule 664
epithelial cell necrosis 446
epithelial cell regeneration 632
epithelial cells 440
epithelial proliferation 636
epithelial–mesenchymal transition 640
epithelioid morphology 578
epithelium 530
Epstein–Barr nuclear antigen 52
Epstein–Barr virus 52
erythroblasts 353
ES cells 42, 212, 235, 257, 580
eternal regeneration 581
ethical concern 45
ethical factors 415
ethical problems 589
eukaryotic organisms 258
everolimus 545
exogenous 111
exome sequencing 585
experimental autoimmune encephalomyelitis 447
expressed sequencing tags 46
expression level 663
expression patterns 106
extinct species 223, 246

extracellular components 680
 extracellular field potential 190
 extracellular matrix 82, 281, 439, 678
 extracellular matrix adhesion 547
 extracellular microenvironment 686
 extraembryonic and embryonic tissues 581
 extraembryonic structures 182
 extrinsic factors 125

f

FACS 280
 familial dysautonomia 54
 Fanconi's anemia 354
 farm animal species 327–329
 – safety of food products from cloned 329–330
 fascicles 275
 fecal occult blood 736
 feedback loop 608
 feedback systems 476
 feeder cell layers 55
 feeder layer 578
 female genotype 262
 fertility 258
 fertilization 265
 fertilized embryos 239
 fetal cell transplants 481
 fetal hemoglobin 418
 fetal neural cells 214
 fetal stem cell 87
 fetal tissues 433
 fiber-optic array-scanning 609
 fibroblast 43, 67, 159, 183, 212, 347, 350, 351, 486, 543, 589
 fibroblast growth factor 180, 375, 587, 694
 fibroblastoid cells 432
 fibronectin 284, 706
 fibrotic repair 380
 first (primary) heart field 375
 first neoplastic stem cell 638
 flow cytometry 192, 524
 flow electroporation 161
 fluorescence-activated cell sorting 85, 491
 5-fluorouracil 122, 524, 737
 focal adhesion signaling 687
 FOLFIRI 739
 FOLFOX 4 737
 Fountain of Youth 581
 four-cell stage 215
 fractures 445
 full-term development 241
 functional behavioral assays 487
 functional cells 657
 functional improvement 592

functional output 194
 functional regeneration 657
 functional transplantation assays 699
 fusion 322

g

G-protein-coupled receptor 108, 543, 606
 G-coupled protein 735
 GABAergic neurons 490
 gain-of-function 539
 gamete 581
 gamma retroviral vectors 350
 gamma-globulin 406
 gas exchange 373
 gastrulation 155, 180, 374
 GATA transcription factors 376
 Gaucher's disease 419
 gemcitabine 536
 gene cassettes 417
 gene delivery 406
 gene-editing technologies 592
 gene expression 46, 107, 158, 181, 187, 235, 236, 379, 694, 702
 gene expression profile 220, 264, 355, 525
 gene knock-out 420, 693
 gene marking 412
 gene mutations 377
 gene program 181
 gene regulatory machinery 681
 gene regulatory proteins 439
 gene silencing 161
 gene targeting 267, 592
 gene therapy 85, 283, 399
 gene transduction 51, 403
 gene transfer 267
 genes 257
 genetic aberrations 354, 587
 genetic analyses 257
 genetic complementation 592
 genetic disease 85
 genetic engineering 580
 genetic information 420
 genetic integrity 269
 genetic lesions 703
 genetic manipulation 111
 genetic mutations 200, 584
 genetic recombination 221
 genetic regulatory cascades 489
 genetic screen 259, 267
 genetic traits 267
 genetic transmission 582
 genetically modified 100
 genome 89
 genome stocks 226

- genome-wide screening 362
 genomic DNA 53, 154
 genomic locus 167
 genotype 259
 germ cell layers 509
 germ cell tumor 165
 germ cells 43, 106, 168, 582, 635
 germ layer lineage 66
 germ layers 180, 238, 347, 509, 578
 germline 579
 germline genome 360
 germline mutation 535
 germline stem cells 105
 germline transmission 46, 223, 267
GFRA1 103
 glaucoma 447
 glial cell line-derived neurotrophic factor 101
 glial cells 53
 glial scar 512
 glioblastomas 606
 glioma 452, 523
 global gene expression 583
 β -globin 413
 globin gene complex 417
 globin gene transfer 416
 glucose homeostasis 182
 glucose transporter 445
 glycogen synthase kinase 3 49
 glycolysis 128
 glycoprotein 87, 180, 418
 glycoprotein pattern 586
 glycosaminoglycans 687
 glycosuria 446
 gold nanoshells 616
 Gorlin syndrome 535
 gPS cells 110
 gradient centrifugation 434
 graft effect 480
 graft-versus-host disease 398, 431
 graft–host interaction 484
 granulation tissue 77
 granulocyte 213, 411, 690
 granulocyte colony-stimulating factor 353, 396, 687
 granulocyte macrophage colony-stimulating factor 441, 548
 granulocyte macrophage progenitor 532, 698
Grb10 gene 310
 green fluorescent protein 122
 growth factors 159, 288, 508, 687
 growth hormones 43
 growth retardation 243
 growth-stimulatory factors 669
Gil2 gene 310
 GVHD 416
 gynogenesis 261
- h***
- H19* gene 24, 309–310
 hair cycle 530
 hair follicle 215, 530, 688
 hallmarks of cancer 657
 hanging drop 183
 haplo-identical transplants 398
 haploid androgenesis 259
 haploid clones 263
 haploid embryos 261
 haploid ES cells 260
 haploid genome 246
 haploid metaphases 262
 haploid syndrome 261
 haploid-diploid ratio 264
 haploidization 264
 haploidy 257
 HDACi 218
 healthcare costs 88
 heart 77, 373
 Hedgehog 525
 Hedgehog ligands 610
 Hedgehog pathway 639
 helper-dependent adenoviruses 593
 hemagglutinin-neuraminidase 353
 hematologic disorders 87
 hematopoietic stem cell 67, 164
 hematopoiesis 122, 401
 hematopoietic cell clones 400
 hematopoietic compartment 212
 hematopoietic cytokines 400, 704
 hematopoietic differentiation potential 361
 hematopoietic lineage 213, 630
 hematopoietic stem cell (HSC) 121, 212, 313, 394, 530, 588, 617, 629, 679
 hematopoietic stem cell transplantation 394
 hematopoietic surface markers 431
 hematopoietic system 530, 631, 690
 hemi-desmosome 685
 hemoglobin 394, 413
 hemoglobin H 414
 hemoglobin polymers 413
 hemoglobin tetramer 413
 hemoglobinopathies 413
 hepatic metastases 739
 hepatocellular carcinoma 609
 hepatocyte growth factor 440, 548, 733
 hepatocytes 50
 heredity 258
 hermaphrodite 223
 hermaphrodite infertile mouse 245

- heterogeneity 438
 heterozygous mutation 702
 Hh effector 611
 Hh inhibitor 611
 Hh signaling 610, 611, 636
 hierarchy model 637
 high-throughput screen 549
 hindbrain 475
 hippocampal resection 483
 hippocampus 447, 694
 histocompatibility locus 397
 histone 2B 122
 histone acetylation 235
 histone acetyltransferase 182
 histone deacetylase inhibitors 211, 643
 histone-deacetylases 635
 histone deacetylation 211
 histone methylation 235
 histone modification 236
 histones 4
 – modifications 5, 307–308
 HLA genes 397
 HLA proteins 397
 HLA typing 45, 399
 HLA-identical marrow allograft 416
 HLA-matched 397
 Holt–Oram syndrome 374
 homeostasis 657, 678, 688
 homeostatic system 122
 homeotic genes 636
 homing endonuclease 421
 homologous recombination 161, 167, 242, 267,
 420, 593
 homozygous diploid cell lines 260
 homozygous mutations 702
 hormonal environment 86
 hormone ablation 661
 HSC proliferation 435
 HSC quiescence 435
 human cell lines 160
 human embryonic stem cell 179, 374, 484
 human ES cell 157
 human genome 592
 human leukocyte antigen 354, 397, 436
 human mammary epithelial cell 609
 human neural stem cell 352
 human pluripotent stem cell 487
 human recombinant protein 85
 human transplantation 84
 human umbilical vein endothelial cell 352
 human xenografts 669
 humans and nonhuman primates and nuclear
 transfer 331
 Huntington's disease 53, 85, 479
 hyaluronic acid 687
 hyaluronidase 702
 6-hydroxydopamine 73, 479
 hydroxyurea 418
 hyperacetylation 236
 hypercholesterolemia 88
 hyperglycemia 446
 hyperplasia 610
 hyperproliferative diseases 657
 hypomethylation 361
 hypoxanthine-guanosine
 phosphoribosyltransferase 420
 hypoxia-induced transcription factor 688
 hypoxia-inducible factor 615
 hypoxic 688
 hypoxic tumor cell 615
 hypoxic–ischemic injury 87
- i*
- I κ B kinase 542
 identical twin 398
 IFN- γ receptor 443
Igf2 gene 24, 309–310
Igf2r gene 24, 310
 imetelstat 546
 immature phenotype 699
 immortality 575
 immune-ablative chemotherapy 409
 immune deficiencies 396
 immune reactions 450
 immune regulation 441
 immune rejection 362, 589
 immune response 506, 541, 579, 586, 706
 immune suppression 215, 398
 immune surveillance 706
 immune system 86, 394, 404
 immunocompromised 665
 immunocompromised mice 606
 immunocompromised mouse model 699
 immunodeficient mice 606, 609
 immunogenicity 100, 450
 immunoglobulin receptor gene 358
 Immunohistochemistry 668
 immunologic barriers 397
 immunological complications 399
 immunological rejection 45
 immunomagnetic cell separation 492
 immunomagnetic selection 398
 immunomodulation 591
 immunomodulatory functions 641
 immunomodulatory potential 441
 immunophenotype 551
 immunorejection 195
 immunostaining 264, 663

- immunosuppressant therapy 89
 immunosuppression 492, 508, 540
 immunotherapy 546, 744
 impaired responses 693
 implantation 159
 imprinted genes 585
 imprinting 5
 – and ESC stability 23–24
 impulse generation 190
 in vitro cellular models 198
 in vitro fertilization 581
 in vivo transplantation 612
 inactivation occurs 216
 Indian Hedgehog 534
 induced pluripotent stem cells (iPSCs) 4, 6, 8, 11,
 17, 20, 23, 28, 99, 163, 235, 301, 309, 332, 582,
 606
 inductive factor 83
 infarct 195
 infarct size 382
 infertile phenotypes 244
 infertility 222
 inflammation 398, 443
 inflammation processes 542
 inflammation-related genes 643
 inflammatory cell infiltration 447
 inflammatory cells 505, 705
 inflammatory factors 695
 inflammatory stimuli 541
 inflammatory trafficking 441
 information networks 575
 inheritance pattern 87
 inner cell mass 42, 154, 179, 346, 578
 insertional mutagenesis 585, 592
 insertional oncogenesis 403
 insulator elements 417
 insulin 186, 588
 insulin-like growth factor-1 186, 360, 694
 $\beta 1$ integrin 125
 $\alpha 7$ -integrin 278
 integrin 666, 687
 integrin antagonist 548
 integrin-mediated adhesion 548
 integrin-mediated signaling 687
 interferon-gamma 411, 508
 interleukin 288, 358, 408, 508, 614, 642, 686, 743
 interleukin-6 191
 interstitial pulmonary fibrosis 89
 intervertebral discs 87
 intestinal crypt stem cells 657
 intestinal macroadenomas 610
 intestinal mucosa 632
 intestinal stem cell 632
 intestinal stem cell niche 614
 intestinal subepithelial myofibroblast 732
 intestine 688
 intracellular organelle 418
 intracellular signaling cascade 688
 intracytoplasmic sperm injection (ICSI) 111, 265,
 312
 intratumoral heterogeneity 618
 intratumoral phenotypes 657
 intrinsic regulators 125
 intrinsic signals 127
 involution–regeneration 661
 ion channel 190
 ionic currents 190
 irinotecan 524, 740
 irradiation 682
 ischemia reperfusion injury 445
 ischemic episode 194
 ischemic injury 445, 538
 ischemic stroke 451
 ischemic tolerance 88
 itraconazole 536
 IVF technology 156, 220
- j**
- JAK/STAT pathway 104
Jarid2 gene 14
 joint inflammation 445
- k**
- Kaposi sarcoma 452
 karyoplast 320
 karyotype 84, 241, 484, 509, 579
 karyotypic abnormality 191
 karyotypic analysis 259
 keratinocyte progenitor cells (KPCs) 313
 keratinocyte stem cells (KSCs) 215, 313
 keratinocytes 215, 352
 keratins 658
 ketoacidosis 451
 kidney disease 445
 kinases 551
 knock-out mouse 376
 KRAS wild-type tumors 740
- l**
- L-DOPA-induced dyskinesia 477
 L-dihydroxyphenylalanine 476
 laboratory animal species and nuclear transfer
 326–327
 laminins 288
 left ventricle 377
 left-ventricular function 451
 lentiviral 351
 lentiviral vectors 52, 350

- leukemia 402, 408, 522
 leukemia inhibitory factor 44, 66, 510
 leukemia-initiating cells 617
 leukemic stem cell 525, 637, 698
 leukemic transformation 698
 leukemogenic activity 699
 levamisole regimen 738
 Lewy bodies 474
 ligand activation 537
 ligand binding 542
 limb malformation 182
 lineage 663
 lineage-tracing 181, 375
 lipid kinase 543
 lipids 418
 lipopolysaccharide 444
 lipoprotein metabolism 182
 lipoprotein receptor-related protein 439
 liquid tumor 542
 liver 539
 liver cancer 453
 liver disease 445
 long-terminal repeat 403
 loss-of-function 539
 loss-of-function mutations 439
 luminal cells 658
 luminal stem cell 663
 lung 539
 lung microvasculature 445
 lymph node involvement 736
 lymphocyte development 406
 lymphocytes 407
 lymphoid cell markers 690
 lymphoid enhancer factor 529
 lymphoid tissues 442
 lymphoid-biased HSCs 691
 lymphoid-myeloid lineage switch 695
 lymphoma 127, 452
 lymphopoiesis 411
 lysosomal enzyme 419
 lysosomal storage diseases 418
- m**
- M-cadherin 278
 macrophage phenotype 441
 macrophages 418, 441
 magnetic resonance imaging 196
 major histocompatibility complex 744
 male infertility 267
 malignancies 640
 malignant tissues 629
 malignant transformation 402, 453, 532, 614, 666
 malignant ventricular arrhythmia 197
- mammalian cloning 234
 mammalian target of rapamycin 543
 mammary epithelial cell 550
 mammary gland 703
 mammary stem cell 608
 mammosphere 613
 mammosphere assay 606
 marrow stromal cells 215
 matched-sibling donor 396
 matrix metalloproteinase 435
 maturation status 188
 Mayo Clinic regimen 738
 medaka 258
 mediated degradation 633
 medulloblastoma 523, 532, 640
 melanocytes 352
 melanoma 452
 membrane potential 198
 mesencephalon 473
 mesenchymal cell 658
 mesenchymal cell markers 640
 mesenchymal markers 431, 436
 mesenchymal stem cell 431, 484, 507, 591
 mesenchymal-to-epithelial transition 352
 mesendoderm 180
 mesoangioblasts 283
 mesoderm 180, 346, 375, 376, 582
 mesodermal markers 187
 mesodermal stem cell 84
 metabolic demand 688
 metabolism 543
 metachromatic leukodystrophy 420
 metastases 736
 metastasis 452, 613, 616
 metastatic adenocarcinoma 732
 metastatic melanoma 454
 metformin 545
 methylation 168
 methylcellulose culture 184
 MHC class I marker 86
 microadenomas 606
 microarray analysis 50, 69
 microarray profiles 239
 microarray technology 188
 microcapillary vasculature 285
 microcarriers 191
 microcirculation 195
 microelectrode array 190
 microenvironment 124, 284, 432, 434, 547, 683, 694
 microRNA (miRNA) 19–21, 50, 104, 288, 350, 605, 613
 migration 685
 minicircle plasmids 351

- minimally invasive delivery 514
 minor histocompatibility proteins 397
 mitochondrial DNA 154
 mitochondrial dysfunction 694
 mitochondrial electron transport 550
 mitochondrial function 128
 mitochondrial heteroplasmy 301, 315
 mitochondrial segregation 168
 mitochondrial translation 551
 mitogen-activated protein kinase 186
 mitomycin C 55
 mitosis 216, 279, 401
 mitotic cleavage 281
 mitotic quiescence 691
 mitotic spindle 685
 mobilization 687
 molecular biology 629
 molecular markers 187, 278
 molecular phenotype 188
 monoclonal antibody 454, 533, 642
 monocytes 418, 690
 monocytic cells 419
 mononuclear cell fraction 353
 mononuclear cells 353, 360, 434
 morphogenesis 379, 659
 morphallaxis 577
 morula 44, 213
 morula-to-blastocyst transition 219
 mosaic oocytes 265
 motor neuron 53, 511, 588
 motor symptoms 474
 mouse brain 691
 mouse lymphoma 606
 mouse prostate cells 661
 MSC phenotype 436
 MSC superfamily 591
 MSC–cancer cell interactions 452
 mucopolysaccharides 418
 mucopolysaccharidoses 431
 multi-agent chemotherapy 739
 multicellular organism 587
 multidrug resistance membrane transporter 541
 multidrug-resistance genes 701
 multidrug-resistance transporter 666
 multilineage differentiation 681
 multilineage differentiation potential 667
 multiple genetic mutations theory 697
 multiple lineage 681
 multiple myeloma 523, 611
 multiple sclerosis 88
 multipotent adult progenitor cell 165
 multipotent cells 576
 multipotent progenitor cells 679
 Multipotent stem cells 482
 multipotential 431
 multipotentiality 438
 murine leukemia models 698
 muscle injury 281, 446
 muscle stem cell self-renewal 290
 muscle stem cells 276
 muscular degeneration 54
 muscular dystrophy 283
 musculoskeletal system 418
 Mutagenesis 267
 mutagens 682
 mutant 126
 mutated alleles 242
 mutations 409, 729
 Myc transgenes 49
 myelination 511
 myelodysplasia 402
 myelogenous diseases 690
 myeloid cell proliferation 412
 myeloid differentiation 690
 myeloid progenitor cells 706
 myeloid-biased HSCs 691
 myeloid-derived suppressor cell 705
 myelomonocytic cells 706
 myelopoiesis 411
 myeloproliferative disorders 54
 myoblasts 275
 myocardial cell markers 376
 myocardial infarction 87, 375, 431
 myocardial lineage 380
 myocardial perfusion 451
 myocardial structure 381
 myocardium 375
 myocytes 198, 373
 myofiber nuclei 276
 myogenesis 282
 myogenic cells 278
 myogenic progenitors 279
 myosin 275, 378
 myostatin 288
 myotubes 589
- n**
- N-cadherin 124
 N-cadherin-mediated adhesion junctions 685
 N-Myc expression 104
 naïve pluripotent stem cell 66
 Nanog 99
 Nanog expression 670
 Nanog transgenes 44
 nanotube connections 288
 National Marrow Donor Program 399
 natural killer 404, 630
 necrosis 505

- neoangiogenesis 705
 neomyogenesis 446
 neoplastic cells 702
 neoplastic process 658
 neovascularization 77, 506, 703, 705
 nephroblastomas 697
 neural cell adhesion molecule 489
 neural cell transplantation 480
 neural cells 588
 neural crest cells 375
 neural crest stem cell 539
 neural development 539
 neural progenitor 47, 588
 neural progenitor cell generation 488
 neural stem cells (NSCs) 47, 88, 213, 313, 352,
 507, 538, 606, 688
 neural stimulation 688
 neural tube 181
 neuroblast 69, 691
 neuroblastomas 697
 neurodegenerative disorder 474
 neuroectoderm 588
 neuroendocrine cells 658
 neurogenesis 691, 695
 neurogenin3 104
 neuroinflammation 447
 neurologic decline 419
 neurologic deficit 506
 neurologic deterioration 419
 neurological disease 445
 neuromuscular junction 695
 neuron-specific markers 494
 neuronal network 480
 neuropathology 494
 neuroprotective effects 447
 neurotransmitter 512
 neurotransplantation 481
 neutrophils 441
 neurotrophins 447, 508
 neutrophil migration 441
 NF- κ B transcription factor 542
 niche 284, 431, 678
 niche dysregulation 678
 niche signaling 694
 nitric oxide 615
 NK cell 442
 NKT cells 213
 NOD/SCID 611
 nodal/activin signaling 180
 noggin 376
 non-neoplastic cells 705
 non-steroidal anti-inflammatory drug 533
 non-human oocytes 241
 non-integrating adenoviral system 351
 non-integrating episomal system 351
 non-integrating Sendai viral system 351
 non-mammalian species and nuclear transfer
 325–326
 non-motor symptoms 475
 nonadherent sphere culture 549
 nonactivated cytoplasts, nuclear transfer into
 316–318
 noncoding RNA 605, 617
 nonhomologous end-joining 593
 nonmyeloablative marrow conditioning 407
 notch activation 612
 notch activator 695
 notch functioning 691
 notch inhibition 539
 notch intracellular domain 537, 611
 notch ligand 634, 643
 notch ligand-Delta 692
 notch pathway 643, 735
 notch receptor 611
 notch receptor-specific antibodies 541
 notch signaling 286, 434, 537, 611, 635, 743
 notch target genes 735
 notochord 181, 376
 ntES cell lines 221, 235
 nuclear donor cell cycle stage choice
 – cell cycle coordination to maintain normal ploidy
 316–318
 – cell cycle coordination to promote
 reprogramming 318
 – donor cell cycle 316
 nuclear injection 321–322
 nuclear membrane 401
 nuclear reprogramming 43, 201, 301, 594
 – and epigenetics 304–305
 – – and blastocyst stage in cloned embryos
 308–309
 – – DNA methylation 305–307
 – – histone modifications 307–308
 – – imprinting and imprinted genes in cloned
 animals 309–310
 nuclear reprogramming technologies 200
 nuclear transfer (NT) 42, 301
 nuclear transfer, for cloning animals 299
 – adult clone phenotypes 324
 – application in different species 325–331
 – artificial activation 322
 – cloned embryos 322–323
 – enucleation 320–321
 – epigenetic differences between donor
 cells 311–314
 – fusion 322
 – genetic differences between donor cells
 314–316

- nuclear transfer, for cloning animals (*contd.*)
 - historical review 302–304
 - nuclear donor cell cycle stage choice 316–318
 - nuclear injection 321–322
 - nuclear reprogramming and epigenetics 304–310
 - pregnancy monitoring and progeny production 323–324
 - recipient cell reprogramming ability 318–320
 - trans-generational effects 324–325
- nuclear translocation 542
- nuclear transplants 265
- nucleofection 161
- nucleolar cycle 262
- nucleolus 158
- nucleolus number 265
- nucleoside analogs 122
- nucleosome 5, 11
- nucleus 212, 422, 529
- nullipotent cells 578

- o**
- obesity 88
- Oct-4 99
- ocular disease 445
- olfactory deficits 474
- olfactory neuroepithelium 484
- olfactory sensory neuron 242
- oligodendrocyte 511
- oligodendrocyte progenitors 191
- oligonucleotide-based hTERT inhibitor 546
- oligonucleotides 420
- oncogenes 584, 657, 699
- oncogenesis 403
- oncogenic transformation 660, 666
- oocyte activation 217, 235
- oocytes 211, 241
- oogonia 69
- optic nerve 507
- organ damage 447
- organ formation 525
- organ regeneration 111
- organ system failure 693
- organogenesis 182
- orphan nuclear receptor 350
- osteoarthritis 445
- osteoblast 69, 434
- osteoblastic niche 123, 685
- osteoblastic niche cells 686
- osteoclasts 435
- osteogenesis imperfecta 431
- osteogenic commitment 439
- osteogenic progenitors 433
- osteoinductive conditions 438
- osteopontin 125, 434
- osteoprogenitors 686
- outflow tract 377
- ova 69
- ovary 539, 686
- oxaliplatin 524
- β-oxidation 182
- oxidative phosphorylation 128, 688
- oxidative stress 541
- oxygen levels 289

- p**
- p21 615
- p53 49, 350, 613, 665, 694
- p53-null transplant model 607
- p53-p21 pathway 356
- p57 127
- pancreas 77
- pancreatic β cells 50, 588
- pancreatic adenocarcinoma 608, 700
- pancreatic cancer 535, 611
- pancreatic islet cells 478
- pancreatic tumors 642
- panitumumab 741
- papillary muscle 194
- paracrine action 591
- paracrine factors 431
- paraplegia 451
- parathyroid hormone 435
- Parkinson disease 73, 87, 473, 588
- Parkinsonian mice 242
- Parkinsonian phenotype 222
- parthenogenetic embryonic stem cells (pESCs) 24
- parthenogenetic embryos 259
- parthenolide 542
- partially methylated domain 585
- passive demethylation 306
- patch-clamp recording 199
- pathogenesis 506
- pathogenetic mechanism 729
- pathogenic infection 269
- pathogenic-related changes 692
- Pax3 278
- Pax7 278
- PEG3 gene 310
- PEG-ADA enzyme therapy 407
- “pegylated” enzyme 406
- pericytes 283, 431
- periosteum 433
- peripheral blood 353, 704
- peripheral blood samples 51
- peripheral blood stem cell 396
- peripheral circulation 690
- peripheral nervous system 418

- perivascular niche 123, 435, 607, 705
 peroxisomes 419
 personalized cell therapy 587
 personalized therapy 166, 593
 pES cells 243
 phagocytosis 442
 pharmacologic inhibition 539
 phase I trial 541
 phenotype 124, 168, 188, 588, 680, 729
 phenotypic heterogeneity 433, 732
 phenotypic modulators 489
 phenotypic monitoring 264
 phenotypic recovery 592
 phosphatase and tensin homolog 126
 phosphorylation 105
 PI3 kinase signaling 693
 piggyBac transposon system 351
 placental development 240
 placental hypoplasia 243
 placental membrane 69
 plasma membrane 277
 plasmid 422
 plastic adherent 431
 plasticity 110, 589
 platelet counts 410
 platelet-derived growth factor 83, 511, 615
 ploidy level 265
 pluripotency 100, 258, 350, 400
 pluripotency gene 535
 pluripotency markers 100, 487, 489
 pluripotency stem cell marker 668
 pluripotent cells 576
 pluripotent markers 187
 pluripotent stem cell 43, 65, 160, 110, 190, 346,
 481, 680
 pluripotent stem cells epigenetic regulation 4–6
 – chromatin higher-order structure 16–18
 – DNA methylation 7–11
 – epigenetic interconversion among mouse ESCs,
 EpiSCs, and human ESCs 24–26
 – ESC pluripotency regulation and miRNA
 differentiation 19–21
 – histone modification and histone variants
 11–16
 – imprinting and ESC stability 23–24
 – telomere function and genomic stability in ESCs
 21–22
 – X-chromosome inactivation 18–19
 point mutations 362
 polycomb group 614
 polycomb group proteins 681
 polycomb proteins 636
 polycomb repressive complex 350
 polyoma middle T antigen 610
 porcine trauma model 81
 porcupine 533
 post-translational modification 534
 postimplantation embryo 183
 postmitotic phenotype 543
 postnatal abnormalities 238
 Potentiability 99
 pre-embryo 156
 preclinical studies 513
 precursor cells 181
 predifferentiation 510
 preimplantation embryo 156
 preimplantation genetic diagnosis 45, 169
 premalignant lesions 736
 primary cultures 261
 primary tissues 492
 primary tumor 667
 primary tumor cells 609
 primitive streak 180
 primordial germ cells (PGCs) 312
 primordial germ layers 220
 pro-apoptotic signaling 682
 pro-inflammatory factors 444
 pro-survival genes 682
 proepicardium 375
 progenitor cell 65, 506, 530, 607, 612, 664, 730
 progenitors 434
 progression-free survival 739
 progressive supranuclear palsy 474
 proinflammatory cytokines 445
 proliferating cells 122
 proliferation 686
 proliferation rate 355
 promyelocytic leukemia zinc finger 103
 prophylaxis 446
 prostaglandin E2 441
 prostaglandins 705
 prostate 539
 prostate cancer 660, 700
 prostate carcinoma 660
 prostate gland 658
 prostate secretions 661
 prostate tumorigenesis 671
 prostatectomy 660
 prostatic ducts 659
 prostatic stem cells 658
 prostatic tubules 662
 prosurvival protein 548
 proteasome inhibitor 542
 protein-coding regions 585
 protein kinases C 741
 protein-secretion 702
 protein transduction 351
 proteoglycan 87, 285

- proteolysis 537
proto-oncogene 52, 409, 543, 694, 742
proto-oncogene protein 403
pseudogene 160
pseudopodia 261
Pten knockout mice 612
Pten-deficient mice 612
pulse-chase cell tracking 381
Purkinje fiber assay 199
- q**
QT interval 198
QT prolongation 199
quiescence 121, 281, 548, 614, 686
quiescent state 682
quiescent stem cells 216, 657
- r**
radiation 700
radiation resistance 524
radiation therapy 522, 660
radiotherapy 405, 454
Rana 320
Rana pipiens 303
random XCI 18
rapamycin 545
reactive oxygen species 688
receptor 106
receptor activation 537
receptor modification 537
receptor-specific antibodies 289
recessive phenotypes 257
recombinant proteins 84
recombination 52, 660
reconstitutive capacity 690
red blood cell 77, 394
regeneration 575, 678
regenerative areas 195
regenerative capacity 276, 373
regenerative medicine 70, 240, 475, 586, 593
regenerative potential 284
regenerative therapies 591
regulatory genes 159
regulatory mechanisms 100
regulatory network 182
rehabilitation regimes 514
rejuvenation 689
relapse-free survival 700
remyelination 511
renal capsule 663
renewal capacity 506
reporter cell lines 593
reporter genes 491
reproductive cloning 240, 302, 331–333
- reprogrammed cells 240
reprogramming 4, 7, 11, 17, 20, 23, 25–26, 183, 217, 247, 347, 485, 578
reprogramming factors 43
resting potential 190
reticular cell 435
retinoblastoma gene 703
retinoic acid 488
retinoic acid γ receptor 703
retinoid X receptor 185
 γ -retroviral-mediated activation 409
retroviral 351
 γ -retroviruses 416
retroviral transfection 355
retroviral vector 399
retroviruses 51, 403
right ventricle 377
RNA interference 551, 613
RNA polymerases 217
RNA transfection 351
RNA-interacting zinc finger protein 50
Roswell Park regimen 738
- s**
salinomycin 550
salivary gland 539
sarcomeres 275
sarcoplasm 276
sarcoplasmic reticulum 188
satellite cell 69, 276, 691, 695
scar tissue 73
Schwann cells 440
sciatica 89
SCID leukemia-initiating cell 699
SCNT cloning 212
screening 405
Scriptaid 218, 237
second (secondary) heart field 375
secondary tumors 579
 γ -secretase inhibitor 540
secreted Frizzled-related protein 530
seed cells 696
self-inactivation 403
self-renewal 43, 121, 159, 279, 525, 530, 605, 612, 633, 638, 657, 665, 678, 743
self-renewing pluripotent cells 576
self-regulation 630
semicloning 265
semisynthetic animals 432
Sendai virus 52
senescence 682, 687
senescence signals 682
senescent mice 245
senescent phenotype 438

- sepsis 445, 447
 septum transversum 379
 serial NT 301, 319–320, 326
 serological markers 736
 serotoninergic neurons 490
 Sertoli cells 214, 313
 serum-free expansion medium 358
SetDB1 gene 14
 severe combined immune deficiency 394
Shelterin 21
 short-hairpin RNA 52, 550
 sickle cell anemia 87, 347
 sickle cell disease 394
 sickle cell phenotype 415
 side population 612, 667
 side-population analysis 524
 signal transduction 410
 signal-transduction pathways 587
 signaling cascade 542
 signaling gradients 684
 signaling molecules 289, 374
 signaling network 543
 signaling pathway 100, 104, 439, 529
 single gene defect 394
 single-cell biopsy 45
 single-cell clonogenic plating 69
 single-cell subcloning 358
 single-nucleotide polymorphism 585
 single-vector reprogramming 100
 sinusoidal endothelium 435
 site of injury 73
 skeletal muscle 77, 275, 539
 skeletal muscle cells 440
 skeletal muscle injury 445
 skeletal muscle tissue 691
 skeletal stem cell 433
 skin 539
 skin biopsy 50
 skin tumor 547
 Smad signaling 105
 small RNA molecules 105
 small-molecule inhibitors 642
 SMO-targeted inhibitor 537
SNRPN gene 24, 309
 solid tumor 524, 542, 606, 617, 657
 somatic cell nuclear transfer 45, 166, 211, 236, 265, 582
 somatic cell nuclei 244
 somatic cell proliferation 50
 somatic cells 44, 582
 somatic nucleus 212
 somatic stem cells 301, 312–314, 686
 somatic tissue stem cell 657
 Sonic Hedgehog 488, 534
 Sox family genes 48
Sox2 99
 SP cells 283
 sperm 69, 101
 spermatids 101
 spermatocytes 101
 spermatogenesis 105
 spermatogonia 69, 98, 101, 260
 spermatozoa 220
 spermatozoon 243
 sphere-formation 670
 spheroids 615
 spinal cord injury 54, 89, 447, 451, 505
 spinal muscular atrophy 54
 spleen 690
 spontaneous differentiation 190
 spumaviruses 403
 squamous cell carcinoma 548
STAT3 614
STAT3 signaling 289
 stem cell 98, 122, 478, 506, 523, 575, 630, 678
 stem cell activation 686
 stem cell aging 285
 stem cell attachment 684
 stem cell biology 373
 stem cell compartment 102
 stem cell concept 629
 stem cell culture 581
 stem cell depletion 693
 stem cell-derived neural precursors 489
 stem cell differentiation 636
 stem cell division 681
 stem cell factor 126
 stem cell fate 99
 stem cell functions 693
 stem cell-intrinsic machinery 688
 stem cell marker 666
 stem cell niche 123, 547, 590
 stem cell–niche interactions 694
 stem cell numbers 691
 stem cell phenotype 697
 stem cell pool 122, 607
 stem cell potency 401
 stem cell proliferation 682
 stem cell response 73
 stem cell signaling 643
 stem cell-specific genes 643
 stem cell-specific signaling pathways 630
 stem cell therapy 478
 stem cell transplant 66
 stem cell transplantation 88
 stem cell zone 731
 stemness 106, 615, 685, 688, 731, 743
 stereotactic neurosurgery 481

- stochastic gene expression 281
 stochastic theory 637
 streptozotocin 445
 stroke 87
 stromal cell 433, 658, 678
 stromal environment 547
 stromal factors 669
 subclones 438
 subgranular zone 691
 substantia nigra 73, 475
 subventricular zone 691
 suicide gene 586
 superoxide 411
 superoxide production 411
 support cells 685
 surface antigen 434
 surface markers 523
 surface phenotype 442
 survivin 586
Suz12 gene 16
 symmetric cell division 630, 633
 symmetric division and differentiation 679
 symmetric expansion 680
 symmetrical self-renewal 679
 synaptic plasticity 479
 synaptic transmission 512
 synaptophysin 664
 syndecans 288
 syngeneic mouse models 587
 synovial fluid 433
 synovial membrane 433
 synthetic messenger RNA 53
 systolic function 382
- t**
- T cell 127, 352, 398, 744
 T lymphocyte activation 446
 T lymphocytes 43
 T-cell activation 744
 T-cell-depleted haplo-identical transplant 405
 T-cell factor 529
 T-cell factor/lymphoid enhancer factor 734
 T-cell induction 443
 T-cell modulatory functions 640
 T-cell profile 443
 T-cell proliferation 441, 446
 T-cell receptor 353, 407, 442
 tamoxifen 613
 target cell type 589
 target gene 44, 128, 533
 targeted chemotherapy 454
 targeting sequence 670
Tcfcp2l1 gene 14
Td1 gene 14
- telomerase 5, 21, 23, 66, 357, 541, 509, 640, 682
 telomerase RNA 219
 telomere 5, 302, 314–315, 545
 – function, and genomic stability in ESCs 21–22
 telomere dysfunction 693
 telomere elongation 357
 telomere erosion 314
 telomere extension 682
 telomere foreshortening 219
 telomere integrity 693
 telomere lengths 211
 telomere position effect (TPE) 22
 template DNA 285
 temsirolimus 545
 tenocytes 440
 teratocarcinomas 509
 teratogen 536
 teratoma 44, 54, 66, 190, 347, 493
 teratoma volume 196
 teratoma-associated genes 586
 testes 102
 testicular niche 686
 testicular teratomas 577
 testis 686
 tetraploid 351
 tetraploid complementation 242
 tetraploid embryo complementation 301, 333
 tetraploid embryos 46
 TF-mediated reprogramming 594
 TGF- β 1 287
 α -thalassemia 414
 β -thalassemia 413, 414
 therapeutic cloning 302, 304, 331–332, 584
 therapeutic response 444
 thrombocytopenia 410
 thrombopoietin 687
 thymopoiesis 408
 tigecycline 550
 tissue atrophy 693
 tissue culture 436
 tissue damage 679
 tissue homeostasis 590
 tissue inhibitors of metalloproteinase 446
 tissue regeneration 592
 tissue regenerative ability 689
 tissue regenerative capacity 692
 tissue rejection 89
 tissue-specific stem cells 164
 TNM classification 737
 toll-like receptor 446
 totipotency 4, 220
 totipotent cell 576
 totipotent stem cells 482
 trabecular bone 123, 434

- trafficking 685
 trans-activate 403
 transcription activator-like effector nuclease 593
 transcription factor 43, 99, 159, 181, 347, 486, 583, 743
 transcriptional coactivators 105
 transcriptional network 681
 transcriptional regulation 681
 transcriptional regulator 536
 transcriptional target 613
 transcriptome analysis 188
 transdetermination 577
 transdifferentiation 436, 440, 577
 transduction 400
 transfection 347
 transforming growth factor 376, 547
 transforming growth factor- β 180, 510, 587, 661, 692
 transgene expression 51, 357
 transgene-expressing T cells 410
 trans-generational effects 324–325
 transgenes 47, 592
 transgenic animals 580
 transgenic hESC lines 192
 transgenic mouse model 665
 transient transfection 351
 transit-amplifying cells 434
 transition protein 2 106
 transmembrane protein 536
 transmembrane receptor 537
 transplantation 185, 194, 351, 444, 586, 658, 690, 696
 transplants 162
 transposase 52
 transposon 100
 transposon vector 52
 transthoracic echocardiography 196
 trauma repair 82
 trichostatin A 236
 tripotency 665
 tripotential differentiation 431
 trophectoderm 582
 trophoblast 155
 trophoectoderm 155
 tropomyosin 187
 troponin I 186
 tumor 522, 605
 tumor-associated macrophage 706
 tumor-associated myofibroblast 617
 tumor blood vessels 740
 tumor bulk 452
 tumor cell cycle progression 453
 tumor formation 44, 489, 589, 592, 609, 696
 tumor growth 452, 614, 699, 732
 tumor initiation 525
 tumor-initiating cell 605, 657, 665, 730
 tumor mass 577
 tumor metastases 704
 tumor microenvironment 453, 614
 tumor necrosis factor- α 288, 441, 687
 tumor necrosis factor-stimulated gene/protein-6 443
 tumor-originating cells 452
 tumor progression 729, 732
 tumor proliferation 539
 tumor recapitulation 669
 tumor regression 535
 tumor relapse 616, 700
 tumor resection 737
 tumor subtypes 609
 tumor suppression 127
 tumor suppressor gene 584, 657, 728
 tumor suppressors 44, 665, 694
 tumor vasculature 547
 tumorigenesis 510, 514, 613, 629
 tumorigenic cells 744
 tumorigenic hierarchy 668
 tumorigenic potential 609, 667
 tumorigenicity 450, 544, 669
 tumors 637, 657
 twist 608
 type I diabetes 588
- u**
- U2af1-rs1* gene 24
 - ubiquitin-mediated degradation 537
 - ultraviolet light-induced mutations 352
 - umbilical cord 354
 - umbilical cord blood 396, 433
 - unclonable
 - strains 222
 - unipotent cells 576
 - unipotent differentiation 111
 - unipotent progenitor cells 69
 - unitarian theory 731
 - urethra 661
 - urogenital sinus mesenchyme 662
- v**
- valproic acid 49, 219, 237, 350
 - vascular cell adhesion molecule 287, 435, 686
 - vascular diffusion 688
 - vascular endothelial growth factor 185, 377, 547, 614, 694, 740
 - vascular epidermal growth factor receptor 741
 - vascular niche cells 686
 - vascular progenitors 280

- vascularity 452
 vascularized tissues 198
 vasculature 705
 vaso-occlusion 413
 vector 422
 vector copy number 408
 vector integration 412
 ventral midbrain 473
 ventricular myocardium 373, 379
 very small embryonic-like 69
 vimentin 608
 viral infection 405
 virus-based vectors 357
 vismodegib 536
 visual function 447
- w**
 Waddington landscape 576
 Wharton's jelly 433
 white blood cell 394
 wild-type gene copies 592
 Wilms' tumor 379, 697
 Wiskott–Aldrich syndrome 402
 Wiskott–Aldrich Syndrome protein 410
 Wnt factors 634
 Wnt inhibitory factor-1 530
- Wnt proteins 439, 733
 Wnt signaling 124, 181, 286, 434, 532, 610, 633
 Wnt/ β -catenin pathway 733
- x**
 X-linked adrenoleukodystrophy 402
 X-linked immunodeficiency 408
 X-chromosome 43, 216
 X chromosome inactivation 5, 18–19, 316
 xenograft 523, 667
 xenograft model 124, 535, 616
 xenograft tumor 540, 667
 xenographic recipients 702
Xenopus laevis 303
 xenotransplantation 302, 304, 699, 703
 Xist expression 217
- z**
 zebrafish 267, 380
Zfp57 gene 14
 zinc-finger endonucleases 422
 zinc finger nuclease 268, 592
 zinc finger transcription factor 181
 zona pellucida 582
 zygote 211, 258, 576