

Index

a

- Abreva™ 139, 140, 147
- acetyl-CoA carboxylase (ACC) 382, 384
- acetylsalicylic acid (ASA) 81
- “acquired immunodeficiency syndrome” (AIDS) 1
- AIDS-associated KS 194
- acute infectious conjunctivitis 285
- acute respiratory distress syndrome (ARDS) 453
- acyclic guanosine analogues 137–139
- acyclic guanosine drug 139
- acycloguanosine 137
- acyclovir, aciclovir 135, 290, 420
- adamantanes and derivatives 63–64
- adaptive COVID-19 Treatment Trial (ACTT) 455
- adefovir 196
- adenain 290
- adeno-associated virus (AAV) 298
- adeno-virus 300
- adenovirus 277
- in human stem cell transplantation 279
- current therapy strategies and antiviral agents 281–283
- incidence, transmission and clinical manifestation 279–283
- novel antiviral approaches in clinical development 283–285
- receptor 277
- replication cycle 280
- infections 277–296
- current therapy strategies and antiviral agents 285–289
- novel antiviral approaches in clinical development 283–285
- incidence, transmission and clinical manifestation in stem cell transplanted patients 279–281
- adoptive T cell transfer and immune checkpoint blockade 180
- AG7404 356
- Aldara™ 142
- alispovir 386
- 6-alkoxy-substituted methylene cyclopropane nucleosides 196
- alkaline phosphatase 257
- allogeneic HSCT 279
- alphavirus 367
- Alzheimer’s disease 144
- amantadines and derivatives 62–63
- amantadine-resistant A(H3N2) virus 64
- Amenalief™ 140
- amenamevir 140
- amiloride 357
- amino acid (AA) virus capsid protein 255
- aminotransferases 257
- anaplastic large-cell lymphoma (ALCL) 179
- Anelloviridae 297
- angiotensin-converting enzyme 2 (ACE2) 451
- anticancer drugs 384
- anti-CD20 antibody Rituximab 179
- antigenic shifts 60

- anti-herpes simplex viruses drugs
 - acyclic guanosine analogues 137
 - chemical structures of 138
 - docosanol 139
 - foscarnet 139
 - helicase–primase inhibitors 140
 - immunomodulators 142
 - monoclonal antibodies 140, 141
 - 5-substituted 2-deoxyuridine analogues 136
 - therapeutic vaccine 140–142
 - vidarabine 137
 - antiretroviral combination therapy
 - (ART) 1–12, 194, 210antiretroviral therapy 2
 - antisense therapies 411, 418
 - antiviral chemotherapy of parvovirus
 - B19-infection 303
 - antiviral drugs
 - arboviruses 374–375
 - antiviral strategies against human cytomegalo virus 151–174
 - APD-209 289
 - 2A protease of enteroviruses 355
 - arbidol 387
 - arenaviruses 409, 420
 - New World 426–429
 - Old World Arenaviruses 420, 423–426
 - arthropod-borne viruses (arboviruses) 367
 - antipyretics 371
 - antiviral drugs and vaccines 372
 - antiviral therapy, targets for 374
 - capsid protein inhibitors 379
 - chikungunya virus 370
 - dengue viruses 369
 - direct acting antivirals 374, 375
 - endocytosis and membrane fusion inhibitors 387
 - envelope protein inhibitors 378–379
 - genome organization 371–373
 - host cell lipid biosynthesis inhibitors 382–384
 - host cell nucleoside biosynthesis inhibitors 381
 - host kinase inhibitors 384–385
 - host-targeting antivirals 380
 - inhibitors with nonspecific action 380
 - methyltransferase inhibitors 379–380
 - nonsteroidal anti-inflammatory drugs 371
 - NS4B inhibitors 379
 - protease/helicase inhibitors 377–378
 - protein metabolism inhibitors 385–386
 - RNA-dependent RNA polymerase 374–377
 - virus replication cycle 372
 - West Nile virus infections 369–370
 - yellow fever virus infections 368–369
 - zika virus infection 368
 - assembly inhibitors of, enteroviruses
 - (EV) 357–358
 - asthma, development of 111
 - asunaprevir 21, 25, 40
 - atomic interaction network analysis 78
 - auristatin E conjugated form 179
 - autoimmune CD4+ T cells 179
 - autologous EBV transformed B cell lines 180
 - AUY-922 204, 207
 - avian hepatitis E virus 254
 - avian influenza virus H7N9 73
 - avian influenza virus strains
 - (H5N1) 67, 73
 - azidothymidine (AZT) 199, 201
 - azithromycin 358
- b**
- bacterial coinfections and influenza 62
 - baloxavir acid (BXA) 71
 - baloxavir marboxil (BAM) 60, 62, 70
 - bat hepatitis E virus 254
 - B cell depleting therapy 177, 179
 - BCX-1812 67
 - BCX4430 413
 - beclabuvir 21, 24, 40
 - benzoxazole analogue 378
 - 9-beta-d-arabinofuranosyladenine 137
 - bevacizumab 202, 206
 - BI-D1870 203, 205
 - bilirubin 257

- Biosafety Level 4 (BSL4) pathogens
 arenaviruses 420–429
 bunyaviruses 429–433
 filoviruses 410–418
 henipaviruses 418–420
 viral hemorrhagic fever viruses 433–435
- BK-Virus 279
- boceprevir 25, 29, 30, 35, 470–471
- bone marrow failure 196
- bortezomib 201, 202, 207, 386
- bosutinib 205
- Bovine Respiratory Syncytial Virus (BRSV) 107
- bovine virus diarrhea virus (BVDV) 14
- brachial neuritis 257
- brentuximab 179
- Brequinar 381
- brincidofovir 152, 153, 154, 283, 418
- brivudine 137, 196
- broadly neutralizing antibodies (BNAPs) 10
- Bundibugyo virus (BDBV) 410
- bunyaviruses 409
 immunotherapy 430
 overview 429
 small molecules 430–433
- Burkitt lymphoma 179
- B19V 301–304
- C**
- Calomys musculus 426
- canine minute virus 297
- capsid assembly for KSHV 209
- capsid assembly effectors (CAEs) 234
- capsid assembly modulators (CAMs) 232–234
 in clinical trials 236, 242–243
 first-generation 234–235
 modes of action 237–238
 resistance profile of 238–242
 second-generation 243
 structures 235
- capsid binders 352, 355, 359
- capsid hexons adenoviruses 277
- capsid protein(s) parvoviruses 298
- capsid protein inhibitors, arboviruses 379
- CAPSTONE 1,2 trials 71, 72
- castanospermine 384, 386
- CD4-cell count 2
- CD4-positive T-lymphocyte count 1
- CD4-receptor positive cells 3
- CD4-receptor positive T-cell 2
- CD8+ T cells 180–182
- CD26 452
- CD46 277
- celgosivir 386
- cell-cell adhesion molecules 134
- cell surface heparan sulfate
 proteoglycans 134
- cellular chaperone heat shock protein 90 (HSP90) 207
- cellular immunity 257
- cellular topoisomerases 207
- Chapare virus (CHPV) 426
- chemokine receptor homologue vGCR (ORF74) 207
- chikungunya fever (CHIKF) 370
- chikungunya virus (CHIKV) 367, 370
 genome organization 371
- chimeric antigen receptors (CARs) 178, 181
- chloromethylketone peptide 465
- chloroquine 376, 380
- 5-(2-Chlorovinyl)-2'-deoxyuridine 196
- chronic chikungunya arthritis (CCA) 370
- chymotrypsin-like cysteine protease (3CL^{pro}) 454, 459
- cidofovir 143, 152, 278, 282, 283, 290, 452
- Circoviridae 297
- circoviruses 297
- classical H274Y NA mutation 74
- 2'-C-methylcytidine (2-CMC) 259, 261, 317, 323–324
- cognate antigen 176
- combination antiretroviral therapy (cART) 2, 4
- core protein allosteric modulators for HBV (CpAMs) 234
- coronaviruses (CoVs) 264, 449–486
 3CL^{pro} 458–459, 463–472
 clinical investigational drugs against coronaviruses 456–459

- coronaviruses (CoVs) (*Contd.*)
 epidemiology of coronaviruses 449–450
 licensed drugs against
 coronaviruses 455–456
 corticosteroids 286
 COVID-19
 disease, phases of 454
 disease progression 453
 mortality 456
 severity 454
 coxsackievirus 277
 3C protease 355
 CRISPR-CASP-technique 10
 CRISPR-Cas13 strategy 358
 crizotinib 202, 206
 CS-8958 69
 2C targeting molecules for picorna viruses 356
 C-terminal DNA binding domain (DBD) 211
 cutavirus (CutaV) 297
 cyclooxygenases (COX) 81
 cyclophilins (CyPs) 384–386
 cyclopropavir derivatives 196
 Cymeven® 278, 282
 cynomolgus macaque model 430
 cytokine release syndrome (CRS) 181
 cytokine storm 61
 cytomegalovirus
 antiviral strategies 151–174
 infections, potential indications 167–168
 pUL viral protein kinase (vPK) 196
 terminase inhibitors 151–156
 cytoplasmic tail (CT) of SARS CoV 473
 cytotoxic CD8⁺ T cells 176
 cytotoxic effect 322
- d**
- daclatasvir 21, 33, 34, 36, 38–40
 Dandenong virus 420
 DAS181 79
 dasabuvir 21, 23, 26, 40
 dasatinib 202, 205
 7-deaza-2'-C-methyladenosine
 (7DMA) 319, 323, 324, 376
 2,3-dehydro-2-deoxy-*N*-acetylneuraminic acid
 (DANA) 64, 65
- Denavir™ 139
 dengue viruses 369, 372
 Dependoparvovirus 298
 depropine 260, 262
 diacetyl 6-deoxy prodrug 139
 diffuse large B cell lymphoma 179
 dihydroorotate dehydrogenase (DHODH)
 inhibitors 381, 384
 dihydroquinazoline derivatives 156
 1,3-dihydroxy-2-propoxymethylpurine 196
 dipeptidyl peptidase 4 (DPP4) 452
 direct acting antivirals (DAA) 14
 combination therapies against
 HCV 21, 35
 particle maturation 289–291
 virus attachment and entry 289–290
 virus genome replication 290
 17-DMAG 203, 207
 DMPK profiling 455, 456
 DNA polymerase 196–201, 208–209
 docosanol 139, 140
 Down's syndrome 98
 dual-split protein (DSP) 476
 dual target therapeutics, enterovirus
 (EV) 358
- e**
- EBNA1 177–182
 Ebola virus 73, 410
 glycoprotein GP 411
 edaphic CD4-receptor 1
 EDP-938 106, 119
 EIDD-1931 107, 119
 EK-1 476
 elevated EBNA1 specific antibodies 179
 encapsidation of enteroviruses 350
 endocytosis, and membrane fusion
 inhibitors 387
 endoplasmic reticulum–golgi intermediate
 compartment (ERGIC) 452
 endosomal sorting complexes required for
 transport (ESCRT) 256
 enteroviruses (EV)
 assembly and release 350
 classification and clinical impact 347

- CRISPR-Cas13 strategy 358
- directly acting antivirals 352
- 2C targeting molecules 356
 - early stage inhibitors 352–355
 - RNA-dependent RNA polymerase (3D) inhibitors 356–357
 - viral protease inhibitors 355–356
- dual target therapeutics 358–359
- genome structure 348
- host targeting antivirals 357
- assembly inhibitors 357–358
 - lipid processing, inhibitors of 357
- monoclonal antibodies 358
- prevention 351
- replication cycle stages 351
- entry 349–350
 - translation and replication 350
- RNAi strategy 358
- virion structure 347–349
- enteroviruses of group A (EV-A) 347
- enteroviruses of group B (EV-B) 347
- enteroviruses of group C (EV-C) 347
- envelope protein inhibitors, arboviruses 378
- epidemic keratoconjunctivitis (EKC) 278, 279, 285, 286
- epidemic Kaposi's sarcoma 194
- “episodic” treatment 135
- Epstein Barr virus (EBV) 279
- adoptive T cell transfer and immune checkpoint blockade 180–181
 - associated extranodal NK/T cell lymphomas 179
 - associated lymphomas 179
 - B cell depleting therapy 179
 - disease overview 175
 - open issues 182–183
 - pharmacological inhibition 177–179
 - therapeutic interventions 178
 - vaccination 181–182
 - virus associated tumorigenesis 176
- Epstein Barr virus nuclear antigens (EBNAs) 176
- Epstein Barr virus small noncoding RNAs (EBERs) 176
- ERK/MAPK pathway 201
- erlotinib 383, 384
- 2'-exo-methanocarbothymidine 196
- f**
- famciclovir 138, 139
- Famvir™ 139
- Fas-associated death domain (FADD) 212
- Favipiravir (FP) 60, 73, 74, 119, 357, 413
- fecal–orally transmitted Hepatitis E Virus 253
- feline calicivirus (FCV) 316
- feline panleukopenia virus 297
- fetal disease 304
- filoviruses 409, 410
- antisense therapies 418
 - EBOV glycoprotein GP 411
 - host-directed therapies 418
 - immunotherapies 411–412
 - postexposure prophylaxis 412–413
 - recombinant vesicular stomatitis virus 411
 - small molecules 413–418
 - virus and disease overview 410–411
- flaviviruses 367
- Fludase 79
- 2'-fluoro-5-iodo-aracytosine 196
- fluoxetine 354, 356
- follicular conjunctivitis (FC) 285
- formalin-inactivated (FI) vaccines 112
- foscarnet 139, 196
- Foscavir™ 139
- FP ribofuranosyl-5'-triphosphate (FRTP) 73
- fucosyltransferases (FUT) 316
- fusion peptide (FP) of SARS CoVs 472
- g**
- galidesivir 457–458
- γ-glutamyltransferase 257
- γ-herpesvirus 175
- ganciclovir 152, 157, 158, 177–178, 196–201, 278, 282, 290
- geldanamycin 207, 357
- genital lesions 133, 140
- genotypes (GT) of HCV 14
- glecaprevir 30, 33, 34, 40

Global Polio Eradication Initiative (GPEI) 352
 GLS4 234, 235, 240, 242, 243
 glutathione (GSH) 357
 glycoproteins of herpes simplex viruses 134
 GPC-N114 259, 260, 261, 354, 357
 GS-5734 413, 417, 421
 Guanarito virus (GTOV) 426
 4-guanidino-2,4-dideoxy-2,3-dehydro-N-acetylneuraminic acid (GG 167) 66, 67
 guanidine hydrochloride (GuaHCl) 354, 356
 guanosine triphosphate (GTP) 258
 Guillain-Barré syndrome 257
 gut microbiota 316, 328–330

h

H1PVAT 352
 H274Y neuraminidase mutation 67
 HBoV1-infection 300, 302
 HCMV protein kinase pUL97 282
 HCV. *See* hepatitis C virus (HCV) 13–58
 Hecolin® 265
 helicase of HEV (Hel) 254
 helicase-primase inhibitors 136, 140, 143, 144
 hemagglutinin (HA) 59, 63, 77
 hematopoietic stem cell transplantation (HSCT) 112, 118, 279, 282
 heme oxygenase 1 (HO-1) inhibitor (SnPP) 208
 hemophagocytic lymphohistiocytosis (HLH) 175, 180
 hemophagocytosis 191, 196
 Hendra virus (HeV) 418–420
 henipaviruses 409, 418
 disease overview 419
 immunotherapies 420
 small molecules 419–420
 hepatitis B virus (HBV) 13, 229–252
 core protein 232–234
 entry inhibitors 232
 first-generation CAMs 234–235
 hepatitis C virus (HCV) 13–14, 253, 257, 259, 291
 drug discovery targets 15

 enable drug discovery tools to 14–15
 NS3/4A protease acyclic covalent binding inhibitors 25–30
 NS3/4A protease acyclic reversible binding inhibitors 28–30
 NS3/4A protease acyclic reversible inhibitors 30
 NS3/4A protease covalent binding inhibitors 29–30
 NS3/4A protease inhibitors 22–24
 NS3/4A protease macrocyclic reversible inhibitors 30–32
 NS3/4 protease P2-P4 macrocyclic inhibitors 30
 NS5A inhibitors 32
 RdRp inhibitor sofosbuvir 259
 hepatitis E virus (HEV)
 clinical course of 256
 Fecal-orally transmitted 253, 264
 genetic diversity and molecular virology of HEV 254–256
 HEV therapy 258
 novel antivirals against HEV 259
 prevention of infection and vaccination strategies for HEV 264
 hepatocyte growth factor (HGF) 206
 heptad repeat 1 (HR1) 473
 heptad repeat 2 (HR2) 473
 herpes simplex viruses (HSV) 133–150, 279
 acyclic guanosine analogues 137–139
 Alzheimer's disease 144
 docosanol 138, 139–140
 epidemiology and manifestation 142
 foscarnet 139, 143
 genital lesions 133, 140
 helicase-primase inhibitors 138, 140–141
 immunomodulators 142
 management of resistant 143–144
 monoclonal antibodies 136, 141
 ocular HSV-1 infections 134
 polymerase chain reaction 134
 resistance mechanisms 143
 replication cycle 134
 5-substituted 2-deoxyuridine analogues 136

- therapeutic vaccines 141
 - thymidine kinase 282
 - treatment of infections 135
 - HSV Type 1 133
 - HSV Type 2 133
 - typical orofacial cold sores 133
 - vidarabine 137
 - viral replication cycle 134
 - herpesvirus entry mediator (HVEM) 134
 - HEV hepatitis E virus 253–276
 - hexon 277
 - histo-blood group antigens
 - (HBGA) 315–318, 328–329
 - histone deacetylase (HDAC) inhibitors 177
 - H1N1pdm09 viruses 66, 68, 69
 - H3N2 and B viruses 68
 - Hodgkin lymphoma 179
 - homozygous CCR5- Δ 32/ Δ 32-gene
 - mutations 10
 - host cell nucleoside biosynthesis
 - inhibitors 381
 - host-directed therapies 418
 - host factors 325
 - host kinase inhibitors, arboviruses 384–385
 - host-targeting candidates against influenza
 - DAS181 79
 - LASAG 81
 - nitazoxanide 80
 - HPMPA((S)-9-[3-hydroxy-2-(phosphonomethoxy)-propyl] adenine 196, 197
 - HSP70 inhibitor 204, 207, 209
 - HSP90 inhibitors 212
 - HSV529 141
 - HSV UL23 and VZV ORF36 thymidine
 - kinases (TK) 199
 - human adenoviruses (HAdVs) 277–296
 - DNA-polymerase 280, 282, 283, 290
 - serotypes 277, 278, 279, 281, 285
 - strains 281, 291
 - human-associated circoviral
 - DNA-sequences 297
 - human bocavirus (HBoV) 297, 298
 - human bufavirus (BuV) 297
 - human corona virus (HCoV) 449–486
 - diseases natural history 453–454
 - replication 450–454
 - human cytomegalovirus
 - (HCMV) 151–174, 279
 - human γ_2 -herpesvirus 191
 - human immunodeficiency virus
 - (HIV) 1–12, 291
 - open inssues in research 10
 - HIV-infection, natural history of 1
 - human intestinal enteroids (HIE) 316
 - human metapneumoviruses 79
 - human norovirus (HuNoV) 313–346
 - binding and entry 318–319
 - disease burden and pathogenesis 313–314
 - gut microbiota 316, 328–330
 - host factors 325
 - in vitro model 316–317
 - in vivo model 317–318
 - monoclonal antibodies 327, 330
 - nitazoxanide 330
 - non-structural proteins 315, 320
 - replication cycle 315–316, 325
 - vaccine development 331–332
 - viral genome 315
 - zinc 330–331
 - human polyomaviruses 279
 - human protein amphiregulin 79
 - α -hydroxy-bisulfite dipeptide 470
 - hydroxypyridonecarboxylic acids 153
 - α -hydroxytropolone 209
 - hypercytokinemia 61
 - hyperimmune globulin 430
 - hypoxia-inducible factor 1 (HIF1) α
 - protein 207, 208
- i**
- iatrogenic, Kaposi's sarcoma (KS) 193
 - idoxuridine 136–137
 - IgA 108, 120
 - imidazoquinolinamine 142
 - iminosugars 385–386
 - imiquimod 142–143
 - immune suppressive cytokine TGF- β 181
 - immunocompromised patients 303, 304
 - immunodominant globular head (HA1) 76
 - immunomodulators 140, 142

- immunoprophylaxis 110, 111, 115
immunotherapies 411, 420
inactivated poliovirus vaccine (IPV) 351
infectious mononucleosis (IM) 175, 176, 181
influenza A and B virions 59, 60, 65,
67, 68, 69
influenza-associated pneumonia 62
influenza A virus 59, 62–64, 66, 68
influenza B virus 59, 62, 63, 66, 75
influenza hemagglutinin glycoprotein
(HA) 59, 77, 78
influenza virus 59–96
adamantanes and derivatives 63–64
hemagglutinin 59
host-targeting candidates 79–82
M2 ion channel blockers 62
matrix 2 protein 59
monoclonal antibodies 60, 63, 76–78
neuraminidase 59, 60, 62
neuraminidase inhibitors 60, 64–69
pandemic situation virus-specific
vaccine 60
pathogenesis of influenza 60–62
polymerase inhibitors 60, 70–76
ribonucleoprotein 59
seasonal influenza epidemics 59
vaccination coverage 60
inhaled zanamivir 67
inosine-5'-monophosphate dehydrogenase
(IMPDH) 258, 264, 381
inosine monophosphate (IMP) 258
integrin α 3 256
interferon (IFN) 181, 325
interferon regulatory factor homologue vIRF3
(ORF K10.5) 207
interleukin 1 β -converting enzyme (FLICE)-
inhibitory proteins (FLIP) 212
Intravenous Immune Globulin (IVIG) 117
in vitro CVB3 replication inhibitors 356
in vitro model 316–317
in vivo model 317–318
murine norovirus 318
5-iodo-2-deoxyuridine 136
ivermectin 376, 380, 388
iVIEW-1201 278, 284, 288
- j**
JNJ-63623872 75
Junín virus (JUNV) 426
- k**
Kaposi's sarcoma 192–194
Kaposi's sarcoma-associated herpesvirus
(KSHV) 191–227
bone marrow failure 196
capsid assembly 209
DNA polymerase 196–201, 209
epidemiological considerations 191
hemophagocytosis 191, 196
interfering with cellular cytokines 206
kinase inhibitors 201–206
life cycle 206–208, 210
multicentric Castlemann
disease 191, 194–195
polyclonal post-transplant
lymphoproliferative disease 195
preclinical data on other cellular
targets 207–208
primary effusion lymphoma (PEL) 194
targeted immunotoxins 210
target productive (lytic) KSHV DNA
replication and/or
packaging 209–210
13-kDa protein 255
kinase inhibitors 201–206
KPT-8602 205, 208
KSHV-associated inflammatory cytokine
syndrome (KICS) 191
KSHV-induced hemophagocytosis 191
- l**
laninamivir 62–65, 69
laninamivir octanoate 69
LASAG 79, 81–82
Lassa fever disease (LFD) 423
Lassa virus (LASV) 423
latency-associated nuclear antigen
(LANA) 211
latent membrane proteins (LMPs) 176
latent viral protein LANA 195, 210
ledipasvir 36, 38, 39

- letermovir 154–170
 clinical efficacy 156–158
 clinical experience 159–164
 clinical samples 165, 167
 potential indications for 167–169
 preclinical models 156–158
 resistance-associated variants 164–165
 resistance development 164–167
 resistance mutations 164–165
 structure–activity relationship 156
- lipid processing, inhibitors of, enteroviruses (EV) 357
- long-acting cART drugs 10
- Lonsurf™ 137
- lower respiratory tract infection (LRTI) 97, 110, 112
- Lujo virus (LUJV) 423
- lumicitabine (ALS-008176 or JNJ-64041575) 106, 118
- lycorine 375, 379
- Lymphocytic Choriomeningitis Virus (LCMV) 420
- d,l-lysine acetylsalicylate glycine 81
- lysosomotropic agents 387
- m**
- Machupo virus (MACV) 426
- marburgvirus genera 410
- Maribavir 152–154, 157, 158
- MARV nucleoprotein 418
- matrix 2 (M2) protein 59
- matrix 2 (M2) ion channel blockers 62
- Mavyret 30, 34, 35, 39–41
- measles vaccine development 113
- MEDI8852 76, 77, 78
- MEDI-8897 118
- MERS-CoV 450, 451
- 5'-7-methylguanylate 254
- methyltransferase (MeT) 254–255
- methyltransferase inhibitors, arthropodborne viruses (arboviruses) 379
- MHAA4549A 76, 77, 78
- mitochondrial antiviral-signaling protein (MAVS) 322
- modified vaccinia virus Ankara (MVA) 182
- molecular biology of parvo viruses 298–299
- Molnupiravir 456, 457
- monoclonal antibodies (mAbs) 140, 141, 328, 411
 MEDI8852 77–78
 MHAA4549A 78
 VIS410 78
- 5-monophosphate 137
- Motavizumab (MEDI-524) 117–118
- mouse hepatitis virus (MHV) 456
- multicentric Castleman's disease (MCD) 191, 194, 195
- multimeric gp350 vaccine 182
- multiple sclerosis (MS) 175
- mycophenolic acid (MPA) 263, 264
- n**
- N-(4-hydroxyphenyl)-retinamide 380
- NAI-resistant influenza viruses 60, 70
- nasopharyngeal carcinoma (NPC) 178
- natural killer (NK) cells 175
- nectin-1 134
- nectin-2 134
- Neu5Ac a(2,3)- and Neu5Ac a(2,6)-Gal linkages 59, 79
- neuralgic amyotrophy 257
- neuraminidase (NA) 59, 60, 62, 64
- neuraminidase inhibitors (NAIs) 60, 64
 laninamivir octanoate 64, 65, 69
 oseltamivir 65–69
 peramivir 64–69
 zanamivir 66–67
- neutralizing antibody (nAb) 411, 412, 427
- New World Arenaviruses 420, 426, 427
- N-finger 463
- NFκB pathway 212
- Niemann-Pick C1 412
- Nipah virus (NiV) 418
- nitazoxanide (NTZ) 79, 80–82, 119, 314, 327, 330
- NITD008 259, 260, 261
- NK cells 181
- NM107 259
- non-A non-B hepatitis (NANBH) 13
- non-Hodgkin lymphomas 194, 195, 200

- non-nucleoside analogues 324, 325
 - non-nucleoside HCV NS5B polymerase
 - palm domain inhibitors 19, 23–24, 26
 - non-nucleoside inhibitors (NNIs) 463
 - arboviruses 376
 - non-nucleoside NS5B Inhibitors 19–21, 39
 - non-nucleoside NS5B polymerase palm domain inhibitors 26
 - non-nucleoside reverse transcriptase inhibitors (NNRTIs) 290
 - nonstructural proteins 1 299
 - 3' and 5' nontranslated region (NTR) 14
 - norovirus 73, 313–346
 - Norwalk virus 313
 - nosocomial transmission 423
 - novel antivirals against HEV 259
 - novel CAMs 236
 - NS1/2 315, 316, 320
 - NS3/4A protease acyclic covalent binding inhibitors 25–30
 - NS3/4A protease acyclic reversible binding inhibitors 25, 28
 - NS3/4A protease acyclic reversible inhibitors 28
 - NS3/4A protease covalent binding inhibitors 29–30
 - NS3/4A protease inhibitors 22–24, 30
 - NS3/4A protease macrocyclic reversible binding inhibitors 31NS3/4A protease macrocyclic reversible inhibitors 30–32
 - NS3/4 protease P2-P4 macrocyclic inhibitors 30
 - NS3 (NTPase/helicase) 320–321
 - NS4B inhibitors, arboviruses 379
 - NS4 (p22) 315, 316, 321
 - NS5A inhibitors 30, 32
 - NS5B polymerase inhibitors
 - non-nucleoside 19–22
 - nucleoside and nucleotide 15–19
 - NS5 (VPg) 321–322
 - NS6 (protease) 322
 - NSC373989 209
 - N-terminal domain (NTD) 473
 - N-terminal tail 463
 - NTPase/helicase domain 23, 315
 - nucleoside analogues 287, 290, 322–325
 - arboviruses 376
 - nucleoside HCV NS5B inhibitors 17, 20
 - nucleoside inhibitors, of NS5B polymerase 15, 19
 - nucleos(t)ide analogs (NAs)
 - mode of action 231
 - reverse transcriptase inhibitors 229, 231
 - nucleotide inhibitors, of NS5B polymerase 15, 18, 20
 - nucleotide kinase 290
 - nucleotidyltransferase activity (NiRAN) 460
- O**
- Ocrelizumab 179
 - ocular HSV-1 infections 134
 - OKG-0301 288
 - Old World Arenaviruses 420–423
 - ombitasvir 36, 38, 40
 - open reading frames (ORF1–3) of noroviruses 315
 - oral polio vaccine (OPV) 351–352
 - ORF1 polyprotein of HEV 254
 - ORF2 capsid proteins of HEV 255
 - ORF9/ORF59 complex of KSHV 209
 - ORF36-encoded viral protein kinase vPK 199–201, 205
 - Orthohepevirus A 254
 - Orthohepevirus B 254
 - Orthohepevirus C 254
 - Orthohepevirus D 254
 - oseltamivir 62–67, 69
 - oxyanion hole 486
 - oxysterol binding protein (OSBP) 357
- P**
- p22 (NS4) 315
 - p48/N-terminal protein (or NS1/2) 315
 - Palivizumab 97, 99, 110, 111, 116–118
 - palliative treatment 288

- pandemic A(H1N1)pdm09 virus 64, 69
 pandemic H1N1 influenza virus 64, 73
 pandemic situation virus-specific vaccine 60
 pandemic strain A H1N1pdm09 66
 papain-like cysteine protease (PCP) 254, 255
 papain-like protein (PL^{pro}) 452
 papilloma-virus 300
 parainfluenza viruses 79, 117
 paratepravir 30
 paritaprevir 31, 32, 40
 Parsonage-Turner syndrome 257
 particle maturation of adenoviruses 280, 289, 290
 Parvoviridae 297–311
 parvovirus 4 (PARV4) 297
 parvovirus B19 297
 parvoviruses 297, 298, 300
 particle 298
 replication 300
 pathogenesis of influenza 60
 PD-1 blocking antibodies 181
 pegIFN- α 258, 260
 pegylated-IFN (PEG-IFN) 14
 penciclovir 136, 138, 139, 140
 peptidomimetic α -ketoamides 467
 peramivir 62–65, 67
 peripheral blood mononuclear cells (PBMCs) 77
 pharyngeal conjunctival fever (PCF) 285
 phenylpropanamide (PPA) 234
 phenylsulfonamide aminopyridines 156
 phosphatidylinositol 4-phosphate (PI4P)
 lipids-enriched membrane microenvironment 357
 phosphorodiamidate morpholino oligomers (PMOs) 418
 PI3K/AKT/mTOR pathway 201, 206
 PI4KIII β inhibitors 357
 pibrentasvir 30, 35, 37, 39, 40
 pimodivir 75–76
 PLA2-enzymatic activity 298, 299, 303
 pleconaril phospholipase 352
 pneumomediastinum 302
 pneumothorax 302
 pocapavir 352
 poliovirus 73
 entry inhibitors 347, 348, 351, 352
 vaccines 351
 polyclonal post-transplant lymphoproliferative disease 195
 polymerase acidic protein (PA) 59
 polymerase basic protein 1 (PB1) 59
 polymerase basic protein 2 (PB2) 59
 polymerase inhibitors against influenza
 Baloxavir marboxil 60, 6270–72
 favipiravir 62, 73–74
 pimodivir 75–76
 polyoma-virus 300
 polyproteins (pp) of Corona viruses 451, 452
 ponatinib 205
 porcine parvovirus 297
 pORF17 polyprotein of KSHV 209
 pORF17 scaffold/protease polyprotein of KSHV 209
 pORF45/RSK complex 205
 postexposure prophylaxis (PEP) 411–413
 post-transplant lymphoproliferative disease (PTLD) 177, 179, 180
 potent Hepatitis E Virus-specific T-cell responses 257
 potential indications for treating cytomegalovirus infections 167–168
 povidone iodine (PVP-I) 287
 Presatovir (GS-5806) 118–119
 primary effusion lymphoma (PEL) 191, 194
 primate bocaparvovirus 297
 primate erythroparvovirus B19V 1, 297
 pritelivir 138, 140, 144
 pro-inflammatory cytokine 72
 prolonged B19V-symptoms 304
 protease/helicase inhibitors, arthropod-borne viruses (arboviruses) 377–378
 protective EBV specific T cell responses 182
 protein metabolism inhibitors, arboviruses 385–386

- protein-protein interactions 322
 - provirion 350, 351
 - PU-H71 203, 207
 - pulmonary aspergillosis 62
 - pyrimidine nitrile 291
 - pyrrolone derivative 378
- r**
- rapid virological response (RVR) 35
 - rat hepatitis E virus 254
 - Ravn virus (RAVV) 410
 - recombinant gp350 vaccine 182
 - recombinant vesicular stomatitis virus (rVSV) 411
 - REGN-EB3 411, 412, 418
 - relaxed circular DNA genome (rcDNA) 232
 - Remdesivir 117, 119, 120, 413, 417, 420, 455, 456, 462, 463
 - replication and transcription compartments (RTCs) 207
 - replication cycle of noro viruses 315–316
 - resiquimod 138, 142
 - resistance-associated variants (RAVs) 165
 - resistant-associated substitutions (RASs) 40
 - Respiratory Syncytial Virus (RSV)
 - infection 76
 - attenuated replication-competent vaccines 114–115
 - challenge of vaccine
 - development 99, 112–114
 - clinical aspects of adult RSV
 - disease 111–112
 - conformational breathing affects
 - neutralization sensitivity 113
 - development of treatments 98–99
 - epidemiology 111–112
 - evasion or suppression of immune memory 108–109
 - on human health burden 97–98
 - immune evasion or immune suppression 114
 - immunoprophylaxis impact 110
 - lack of immunogenicity 114
 - life cycle 103
 - longevity 108
 - measles versus vaccine development 113
 - M2-1 inhibitor 119
 - secondary endpoints 114
 - surface glycoproteins 108
 - symptoms 110
 - therapeutics and vaccine research 97
 - transmission 98
 - virus and replication cycle 99–104
 - wheeze 110–111
 - Reston virus (RESTV) 410
 - reverse transcriptase (RT)
 - inhibitors 229, 231
 - rhadinovirus 191
 - rhinoviruses 347, 355–358
 - RI-001 105, 117–118
 - RI-002 105, 117
 - ribavirin 117, 259, 260, 262, 265, 278, 282, 323, 324, 419, 420, 422
 - ribavirin monophosphate (RMP) 258
 - ribavirin triphosphate (RTP) 258
 - ribonucleoprotein (RNP) 59
 - Rilematovir 119
 - rimantadine 62–64
 - Rituximab 179
 - RNA dependent RNA polymerase (RdRp) 15, 254, 256, 258, 259, 314–316, 320–322, 459–463, 477
 - arboviruses 367–408
 - inhibitors, enteroviruses (EV) 352–359
 - RNA interference (RNAi) strategy 358
 - RNAse H-like nucleotidyltransferases 209
 - RSV-F fusion glycoprotein 102–104
 - RSV-G glycoprotein 102, 108
 - RSV-IGIV 115–116
 - RSV-SH glycoprotein 104, 107
 - rupintrivir 321–322, 355, 356, 465, 466
 - (+)-rutamarin 204, 207
 - rVSV-EBOV vaccination 412
 - RWJ-27020 67
- S**
- S31N substitution 64
 - S-033188 71

- Sabiá virus (SABV) 424, 426
- Sapanisertib 203, 206
- SARS-CoV-1 450–457
X-ray crystal structures of 473
- SARS-CoV-2 450–486
X-ray crystal structures of 473
- SARS-CoVs RNA-dependent RNA polymerase 460, 463
- saturation transfer difference nuclear magnetic resonance (STD NMR) 318
- scaffold (assembly) protein of KSHV 209
- seasonal influenza A/H1N1pdm09 59, 60, 68, 78
- seasonal influenza epidemics 59
- secondary bacterial coinfection 62
- serine protease domain 23
- serine protease of KSHV 209SHP640 287
- sialic acids (SAs) 277, 289
- Sigmodon alstoni 426
- siltuximab 202, 206
- silvestrol 260, 264
- simeprevir 30, 31, 39
- single-stranded (ss) DNA-viruses
antiviral chemotherapy of parvovirus B19-infection 303
classification 297–298
molecular biology 298–300
parvovirus replication 300
therapeutic options and recommendations 303–304
- SiSunatovir 106, 119
- sliding poles 461
- small interfering RNAs (siRNAs) 418
- small molecule 419–420, 421, 423, 424, 430–431
NFkB inhibitors 207, 212
- sofosbuvir 17–20, 30, 38–41, 259, 260, 374
- solid organ transplantation (SOT) 151, 166, 167, 279
- specific cART-drug 2
- S protein of Corona virus 463, 472, 473–475, 477
- squaric acid dibutyl ester (SADBE) 138, 142
- SQX770 138, 142
- 1-[(2S,4S-2-(hydroxymethyl)-1,3-dioxolan-4-yl]5-vinylpyrimidine-2,4(1H,3H)-dione 196, 198
- sterol regulatory element-binding proteins (SREBP) 382–384
- Strategic Timing of Antiretroviral Treatment (START) 10
- structural proteins of Parvo viruses 298, 299
- structure-based drug design (SBDD) 467
- subepithelial corneal infiltrates (SEIs) 286
- 5-substituted 2-deoxyuridine analogues 136
- Sudan virus (SUDV) 410
- 3-O-sulfonated heparan sulfate 134
- sunitinib 383, 384, 389
- surrogate systems 14
- sustained virological response (SVR) 19, 28
- SWISS STATEMENT hypothesis 10
- symptomatic HAdV disease 281
- t**
- T-705 73, 74, 319, 324, 448
- Tai Forest virus (TAFV) 410
- targeted immunotoxins 210
- target productive (lytic) KSHV DNA replication and/or packaging 209
- T cell 168, 175, 176, 180
- T cell mediated immune control 176
- T cell receptor (TCR) 178, 181
- TCN032 76
- Technivie 32, 40
- tegument-coated capsid 134
- telaprevir 25, 29, 30, 35, 354, 356
- telbivudine for parvovirus infections 303
- terminase inhibitors of CMV 151–156
- tetrapeptide nitrile 291
- therapeutic vaccines 140, 141
- thymidine kinase (TK) 134
- TK/ORF21 200
- TLR-7 antagonists 142
- tocilizumab 202, 206
- Togaviridae 367, 370
- Toll-Like Receptor (TLR) 112

- tomeglovir against cytomegalovirus
 terminase 156
 torque-teno-midi-virus (TTMDV) 297
 torque-teno-virus (TTV) 297
 transient aplastic crisis (TAC) 302–303
 transmembrane region (TM) of coronavirus S
 protein 473
 transmission electron microscopy 100
 transplant-associated KS 193
 trifluorothymidine 136
 trifluridine 136–138
 5-triphosphate (TP) 137
 trisodium phosphonoformate 139
 tryptophan dendrimers 355
 tumor necrosis factor (TNF) 178
 tumor necrosis factor receptor-related
 herpesvirus entry receptor 134
 tumor necrosis factor (TNF) receptor-
 associated factors (TRAFs) 179
 tusavirus (TusaV) 297
 typical orofacial cold sores 133
 Tyro3/Axl/Mer TK (TAM) family 206
- u**
- UL23 gene coding 143
 UL56 of cytomegalovirus 164–166
 UL97 of cytomegalovirus 152
 United Nations Program on HIV/AIDS
 (UNAIDS) 10
 upper respiratory tract (URT) infection 116
 uracil-DNA glycosylase 134
- v**
- vaccination against EBV 181
 vaccine-derived polioviruses (VDPV) 352
 vaccines, poliovirus 351
 valacyclovir 137
 Valcyte® 282
 valganciclovir (VGCV) 152, 158, 167–169,
 199, 200, 278, 282
 Valtrex™ 137
 varicella zoster virus (VZV) 133, 279
 vascular endothelial growth factor
 (VEGF) 201, 202, 206
 velpatasvir 37, 39, 40
 VER-155008 207, 209
 vFLIP/IKK γ -dependent NF κ B
 activation 212
 vFLIP-interacting protein NEMO/
 IKK γ 207
 VH244 107, 119
 vidarabine 137, 138
 Viekira Pak 32, 35, 38, 40
 viral DNA derived palindromic
 oligonucleotide 177
 viral DNA synthesis 134, 154
 viral genome 315, 328
 Viral genome (H)CMV 151, 154, 164
 viral hemorrhagic fever (VHF) 410, 433
 viral replication cycle 134
 viral replication cycle, kinetics of 154
 viral ribonucleoprotein (vRNP)
 segments 59
 viral RNA synthesis 59
 viral tegument protein encoded by
 ORF45 205
 Viroptic™ 136
 virulence factor 1 (VF1) 315
 virus associated tumorigenesis 176
 virus attachment and entry of adeno-
 viruses 289
 virus-encoded protein kinases 282
 virus genome replication 290
 virus-like particles (VLPs) 114, 178, 182
 VIS410 78
 VP1-unique region 298, 300, 301, 303
 VPg (NS5) 315
 vPK/ORF36 200, 201
 VX-787 75
- w**
- West Nile virus (WNV) 73, 367, 369, 372
 wheeze 110–111
- x**
- xanthosine monophosphate (XMP) 258
 Ximency 21, 24, 29, 40
 X-ray crystallography 318

y

yellow fever virus (YFV) infections 367,
368–369, 372

z

zanamivir 63–69

zanamivir-resistant A(H1N1)pdm09 and
H3N2 isolates 67

Zika virus (ZIKV) infection 367, 368, 372

zinc 330–331

Ziresovir (AK0529) 106, 119

ZMapp 411, 412

Zostex™ 137

Zovirax™ 137, 139

