

Antiviral Compounds

Viruses are among the major pathogenic agents that cause number of serious diseases in humans, animals and plants. Viruses are ultra-microscopic agents having either DNA or RNA as the genetic material. The fight between humans and viruses is a continuous process, as both will adopt different strategies to fight against each other. Antiviral agent development is a tedious process involving many stages such as target identification and screening, lead generation and optimization. Developing strategies for the antiviral agents are focused on two different approaches: Targeting the viruses themselves or the host cell factors. Antiviral agents that directly target the viruses include inhibitors of virus attachment or entry, uncoating inhibitors, polymerase inhibitors, protease inhibitors, inhibitors of nucleoside and nucleotide reverse transcriptase and the inhibitors of integrase. They bind viral proteins or nucleic acids involved in viral entry, transcription, replication of the viral genome, assembly and release of infectious viral particles. Host-directed antiviral agents modulate the activity of host factors and pathways involved in the synthesis, processing and transport of viral building blocks, as well as in the development of antiviral and inflammatory responses. Antiviral agents are presented in numerous molecular forms, including small molecules, peptides, neutralizing antibodies, interferons (IFNs), CRISPR-Cas systems, si/shRNA, and other nucleic acid polymers (NAPs). Interferons and some small molecules alone or in combinations possess broad-spectrum antiviral activity and are important tools for antiviral research.

Antiviral Compounds Overview

PRODUCT NAME	PID	CAS	Viral Steps	Target Viruses (described in literature)
16-epi-Latrunculin B	AG-CN2-0034	444911-05-1	U	HSV-1
2-Deoxy-D-glucose	AG-CR1-3681	154-17-6	Met/V R	CVB3, HSV-1, IFV, RSV, RV, SARS-CoV-2
Aloxistatin [E-64d]	AG-CR1-3737	88321-09-9	V E/R	SARS-CoV-2
Amastatin . HCl	AG-CP3-7003	100938-10-1	V E/R	HCV, HIV, SARS-CoV-2
(-)-Arctigenin	AG-CN2-0530	7770-78-7	V E/R	CHIKV, HIV-1, HSV-1, IFV (H1N1), JEV, SARS-CoV-2. Fish: IHNV, SVCV, VHSV
(-)-Arctiin	AG-CN2-0532	20362-31-6	V R	AIV (H9N2), ASFV, HSV-1, IFV (H1N1)
Artesunate	AG-CN2-0469	88495-63-0	V R	HBV, HCMV, HIV-1, HSV-1, IFV (H5N1, H1N1, H3N2), SARS-CoV-2
Avarol	AG-CN2-0044	55303-98-5	V R	HIV-1
Bakuchiol	AG-CN2-0495	10309-37-2	V R	IFV
Baricitinib	AG-CR1-3734	1187594-09-7	V E/C S	HIV-1, SARS-CoV-2
Beauvericin	AG-CN2-0043	26048-05-5	V R	HIV-1, SARS-CoV-2

PRODUCT NAME	PID	CAS	Viral Steps	Target Viruses (described in literature)
Betulin	AG-CN2-0476	473-98-3	V E/R	DENV, ECHO6, EMCV, HCMV, HIV, HSV-1/2, IFV (H7N1), SARS-CoV-2, VSV
Boceprevir	AG-CR1-3735	394730-60-0	V T/ R	HCV, SARS-CoV-2
(+)-Brefeldin A	AG-CN2-0018	20350-15-6	V R	DENV, JEV, RV, SARS-CoV-2, ZIKV
Budesonide	AG-CR1-3753	51333-22-3	V R/C S	HCoV-229E, HIV, HRV, SARS-CoV-2
Camostat . mesylate	AG-CR1-3716	59721-29-8	V E	IFV, MERS-CoV, SARS-CoV, SARS-CoV-2
Celastrol	AG-CN2-0460	34157-83-0	V R	HCV, HIV-1, IFV, SARS-CoV, SARS-CoV-2
Chloroquine . diphosphate	AG-CR1-3721	50-63-5	V R	CHIKV, DENV, HIV-1, IFV (H1N1, H3N2), SARS-CoV-2
Clevudine	AG-CR1-3736	163252-36-6	V R	HBV
Curcumin (high purity)	AG-CN2-0059	458-37-7	V E/R	CHIKV, DENV, EBOV, HCV, HIV, HSV, HTNV, IFV, JEV, NiV, RVFV, SARS-CoV, SARS-CoV-2, SINV, VSV, ZIKV
Darunavir	AG-CR1-3712	206361-99-1	V M/R	HIV-1, SARS-CoV-2
Darunavir . ethanolate	AG-CR1-3724	635728-49-3	V M/R	HIV-1, SARS-CoV-2
Dasatinib	AG-CR1-3540	302962-49-8	V E/R	HIV-1, SARS-CoV-2
Dihydroartemisinin	AG-CN2-0468	71939-50-9	V R/C S	HCMV, IFA (H1N1), SARS-CoV-2
Ebselen	AG-CR1-0031	60940-34-3	V R	EMCV, HCV, HIV-1, HSV, IFV (H1N1), SARS-CoV-2, ZIKV
Efavirenz	AG-CR1-3751	154598-52-4	V R	HIV-1
EIDD-2801	AG-CR1-3733	2349386-89-4	V R	CHIKV, EBOV, IFV, MERS-CoV, MHV, RSV, SARS-CoV, SARS-CoV-2, VEEV
Elbasvir	AG-CR1-3729	1370468-36-2	V R	HCoV-OC43, HCV, SARS-CoV-2
Enoxacin	AG-CR1-3539	74011-58-8	V R	MERS-CoV, SARS-CoV-2, SFV, ZIKV Insects: CrPV, DCV, DENV, ZIKV
Euphol	AG-CN2-0541	514-47-6	V T/R	EBV, HIV-1, SARS-CoV-2
Famotidine	AG-CR1-3730	76824-35-6	V R	HIV-1, SARS-CoV-2
Favipiravir	AG-CR1-3717	259793-96-9	V T/R	CHIKV, EBOV, IFV (H1N1, H5N1, H7N9), MARV9, NV, RVFV, SARS-CoV-2, WNV, YFV, ZIKV
Fumagillin	AG-CN2-0529	23110-15-8	V T	HIV-1
G418 . sulfate	AG-CN2-0030	108321-42-2	V R	BVDV, DENV, HCV, SARS-CoV-2
Gardiquimod	AG-CR1-3583	1020412-43-4	V R	HIV-1, MNV
Genipin	AG-CN2-0481	6902-77-8	V R	EBV, RV. Fish: WSSV
Herbimycin A	AG-CN2-0429	70563-58-5	V R	HBV, HCV, HHV-6
Hydroxychloroquine . sulfate	AG-CR1-3720	747-36-4	V R	CHIKV, HCV, HIV-1/2, MERS-CoV, SARS-CoV, SARS-CoV-2, ZIKV
Hypericin	AG-CN2-0449	548-04-9	V R	FMDV, HCMV, HIV-1, PRRSV, SARS-CoV-2
Ibudilast	AG-CR1-3738	50847-11-5	V R/C S	HIV-1, SARS-CoV-2
Imatinib . mesylate	AG-CR1-3725	220127-57-1	V E/R	HIV-1, MERS-CoV, SARS-CoV, SARS-CoV-2

PRODUCT NAME	PID	CAS	Viral Steps	Target Viruses (described in literature)
Isoliquiritigenin	AG-CN2-0459	961-29-5	V R	EMCV, HCV, HSV1/2, IFA (H1N1), VSV
K-252c	AG-CN2-0097	85753-43-1	V R	HCMV, VSV
K777 [K11777]	AG-CR1-0158	233277-99-1	V E	EBOV, HEV, MERS-CoV, SARS-CoV, SARS-CoV-2
Leupeptin . hemisulfate	AG-CP3-7000	103476-89-7	V E/R	IFA (H1N1), PEDV, SARS-CoV-2
Linagliptin	AG-CR1-3618	668270-12-0	V R	MERS-CoV, SARS-CoV, SARS-CoV-2
Lopinavir	AG-CR1-3715	192725-17-0	V M/ R	HIV-1, MERS-CoV, SARS-CoV, SARS-CoV-2
Loxistatin acid [E-64c]	AG-CP3-7007	76684-89-4	V E/R	FMDV, MERS-CoV, RV, SARS-CoV
Loxoribine	AG-CR1-3584	121288-39-9	V R	IFA, MNV
Merafloxacin	AG-CR1-3756	91188-00-0	V R	SARS-CoV-2
MLN4924 [NAE Inhibitor]	AG-CR1-3703	905579-51-3	V R	HBV, HCMV, HSV-1/2, IFA, SARS-CoV-2
Mycophenolic acid	AG-CN2-0419	24280-93-1	V E/R	HCV, HIV, IFV (H1N1, H5N1, H7N9), MERS-CoV, SARS-CoV, SARS-CoV-2
Nafamostat mesylate	AG-CR1-3731	82956-11-4	V E/R	CoV (broad), MERS-CoV, SARS-CoV-2, IFV (H1N1, H3N2), ZIKV
Narciclasine	AG-CN2-0524	29477-83-6	V R	DENV, DENV-2, JEV, YFV, ZIKV
Nelfinavir . mesylate	AG-CR1-3726	159989-65-8	V R	HIV, HSV-1, KSHV, SARS-CoV-2
Niclosamide	AG-CR1-3643	50-65-7	V E/R	CHIKV, DENV, EBV, HCV, HEV, HIV, HRV, IFV, JEV, MERS-CoV, SARS-CoV, SARS-CoV-2, ZIKV, RSV. Pig: PEDV. Chicken: NDV
Niclosamide . ethanolamine	AG-CR1-3644	1420-04-8	V E/R	Same Targets as AG-CR1-3643
Nitazoxanide	AG-CR1-3723	55981-09-4	V M/T/R	CHIKV, EBOV, HBV, HCV, HIV, IFA (H1N1, H7N9), JEV, MERS-CoV, NV, RV, SARS-CoV-2, VACV. Pig: PRRSV. Dog: CPV
Oleuropein	AG-CN2-0538	32619-42-4	V R	HBV, HIV-1, Para 3, RSV, SARS-CoV-2, VHSV
Oseltamivir . phosphate salt	AG-CR1-3714	204255-11-8	V R	IFV (IAV (H1N1, H3N2), IBV)
Papaverine . hydrochloride	AG-CN2-0414	61-25-6	V R	HIV, HPIV3, HVJ, IFV (H1N1, H3N2), MV, PIV5, RSV, SARS-CoV-2
Podophyllotoxin	AG-CN2-0049	518-28-5	V R	HIV, HPV, HSV
PX-12	AG-CR1-3739	141400-58-0	V R	HIV, SARS-CoV-2
Quercetin . dihydrate	AG-CN2-0409	6151-25-3	V E/R/Rel	ASFV, BVDV, DENG, FMDV, HBV, HCV, HIV-1, HSV-1/2, IFV, Para 2, PEDV, RSV, RV, SADS-CoV, SARS-CoV-2, ZIKV
R-848	AG-CR1-3582	144875-48-9	V R	HCV, HIV, HSV
Remdesivir	AG-CR1-3713	1809249-37-3	V T/R	EBOV, LFV, MARV, MERS-CoV, RSV, SARS-CoV, SARS-CoV-2. Mouse: MHV
Remdesivir Metabolite GS-441524	AG-CR1-3722	1191237-69-0	V T/R	EBOV, LFV, MARV, MERS-CoV, RSV, SARS-CoV, SARS-CoV-2. Mouse: MHV
Ribavirin	AG-CR1-3719	36791-04-5	V T/R	HCV, HFVs, IFV, MV, NV, RSV, RV, SARS-CoV, SARS-CoV-2
Rilpivirine	AG-CR1-3750	500287-72-9	V R	HIV-1
Ritonavir	AG-CR1-3683	155213-67-5	V M/R	HCV, HIVs, MERS-CoV, SARS-CoV, SARS-CoV-2

PRODUCT NAME	PID	CAS	Viral Steps	Target Viruses (described in literature)
(R)-Roscovitine	AG-CR1-0006	186692-46-6	V R	HSV-1, IFV, VZV
Rosuvastatin . calcium salt	AG-CR1-3728	147098-20-2	V R	SARS-CoV-2
Ruxolitinib (free base)	AG-CR1-3624	941678-49-5	V R	HIV-1, SARS-CoV-2
Ruxolitinib . phosphate salt	AG-CR1-3645	1092939-17-7	V R	HIV-1, SARS-CoV-2
Saquinavir . mesylate	AG-CR1-3727	149845-06-7	V R	HIV-1/2, SARS-CoV-2
Sekikaic acid	AG-CN2-0502	607-11-4	V R	RSV
Shikonin	AG-CN2-0487	517-89-5	V R	EBV, EV71, HCV, HIV-1, SARS-CoV-2
Siamycin I	AG-CN2-0146	164802-68-0	V E/R/Rel	HIV-1, HSV
SP600125	AG-CR1-3549	129-56-6	V R	HCMV, IFV, VSV
Suramin . hexasodium salt	AG-CR1-3575	129-46-4	V T/R	CHIKV, DENG, EBOV, EV71, HCV, HIV-1, HSV, RVFV, SARS-CoV-2, ZIKV
Suramin . sodium salt	AG-CR1-3575V	129-46-4	V T/R	CHIKV, DENG, EBOV, EV71, HCV, HIV-1, HSV, RVFV, SARS-CoV-2, ZIKV
TDZD-8	AG-CR1-3740	327036-89-5	V R	SARS-CoV-2
Telaprevir	AG-CR1-3741	402957-28-2	V R	HCV, SARS-CoV-2
Tofacitinib	AG-CR1-3625	477600-75-2	V R	HIV-1, SARS-CoV-2
Tofacitinib citrate	AG-CR1-3732	540737-29-9	V R	HIV-1, SARS-CoV-2
Umifenovir . hydrochloride	AG-CR1-3718	131707-23-8	V E	EBOV, HBV, HCV, IFV, RSV, SARS-CoV-2, ZIKV
VIP (human, mouse, rat) . acetate [RLF-100]	AG-CP3-0041	1444827-29-5	V R	HCMV, HIV, RSV, SARS-CoV-2, VSV, ZIKV
Wogonin	AG-CN2-0064	632-85-9	V R	HBV, HIV-1, HSV1/2, IFV. Pig: PEDV.

Virus Abbreviations:

AIVs: Avian Influenza Viruses; ASFV: African Swine Fever Virus; BVDV: Bovine Viral Diarrhea Virus; CHIKV: Chikungunya Virus; CPV: Canine Parovirus; CrPV: Cricket Paralysis Virus; CVB3: Coxsackievirus B3; DCV: Drosophila C Virus; DENV: Dengue Virus; EBOV: Ebola Virus; EBV: Epstein-Barr Virus; ECHO6: Echovirus 6; EMCV: Encephalomyocarditis virus; EV71: Human Enterovirus 71; FMDV: Foot-and-Mouth Disease Virus; HBV: Hepatitis B Virus; HCMV: Human Cytomegalovirus; HCoV-229E: Human Coronavirus 229E; HCoV-OC43: Human Coronavirus OC43; HCV: Hepatitis C Virus; HEV: Hepatitis E Virus; HFVs: Hemorrhagic Fever Viruses; HHV-6: Human Herpesvirus 6; HIV: Human Immunodeficiency Virus; HPIV: Human Parainfluenza Virus; HPV: Human Papillomavirus; HRV: Human Rhinovirus; HSV: Herpes Simplex Virus; HTNV: Hantaan Virus; HVJ: Sendai Virus; IAV: Influenza A Virus; IBV: Influenza B Virus; IFV: Influenza Virus; IHN: Infectious Hematopoietic Necrosis Virus; JEV: Japanese Encephalitis Virus; JUNV: Junin Virus; KSHV: Kaposi's Sarcoma-associated Herpesvirus; MARV9: Marburg Virus; MERS-CoV: Middle East Respiratory Syndrome; MHV: Mouse Hepatitis Virus; MNV: Murine Norovirus; MV: Measles Virus; NDV: Newcastle Disease Virus; NiV: Nipah virus; NV: Norovirus; Para 2: Parainfluenza Type 2 Virus; Para 3: Parainfluenza Type 3 Virus; PEDV: Porcine Epidemic Diarrhea Virus; PIV5: Parainfluenza Virus 5; PRRSV: Porcine Reproductive and Respiratory Syndrome Virus; RSV: Respiratory Syncytial Virus; RV: Rotavirus; RVFV: Rift Valley fever virus; SADS-CoV: Swine Acute Diarrhea Syndrome Coronavirus; SARS-CoV: Severe Acute Respiratory Syndrome Coronavirus; SARS-CoV-2: Severe Acute Respiratory Syndrome Coronavirus 2; SFV: Semliki Forest Virus; SINV: Sindbis Virus; SVCV: Spring Viremia of Carp Virus; VACV: Vaccinia Virus; WEEV: Venezuelan Equine Encephalitis Virus; VHSV: Viral Hemorrhagic Septicemia Virus; VSV: Vesicular Stomatitis Virus; VZV: Varicella-Zoster Virus; WNV: West Nile Virus; WSSV: White Spot Syndrome Virus; YFV: Yellow Fever Virus; ZIKV: Zika Virus

Target Abbreviations:

V R: Viral Replication; V E: Viral Entry; Met: Metabolism; C S: Cytokine Storm; Rel: Release; V T: Viral Transcription; V M: Viral Maturation; T: Transcription; R: Replication; U: Unknown