

Coronavirus Type	Drugs Used	Status and mechanisms	FDA Approved?	Countries	It was useful?	How many people affected?	Positive Results	Negative Results	Guideline	Reference	Notes
COVID-19	Lopinavir 200mg / Ritonavir 50mg twice a day + Oseltamivir + Chloroquine	NA	Yes	India	YES	7	7	0	NA	https://timesofindia.indiatimes.com/city/jaipur/city-docs-cure-corona-patient-with-hiv-drugs/articleshow/7458489.cms https://timesofindia.indiatimes.com/indiarajasthan-urns-into-learning-ground-as-7-covid-19-patients-declared-cured/articleshow/74644017.cms https://www.nature.com/articles/s41422-020-0282-0 https://archid.com/articles/13823.html https://thorax.bmj.com/content/95/3/352.long	
COVID-19	Remdesivir	Phosphoramidate prodrug of an adenine analog used for Ebola and Marburg virus outbreaks (similar structure to approved HIV reverse transcriptase inhibitors)	Not Found	Diamond Princess cruise ship	YES	14	>7	0	Remdesivir intravenously once a day for 10 days	https://www.nasdaq.com/articles/gilead-up-as-remdesivir-shows-promise-in-treating-coronavirus-2020-03-16 https://www.statnews.com/pharmatol/2020/03/13/gilead-coronavirus-covid19-clinical-trials/ https://www.medrxiv.org/content/10.1101/2020.03.09.20032896v1.full.pdf https://www.pnas.org/content/early/2020/02/12/1922083117 https://www.nature.com/articles/s41422-020-0282-0 https://sfm.sciencemag.org/content/9/3/396/eaal3653.full https://mmrjournal.biomedcentral.com/articles/10.1186/s40779-020-00240-0	Prophylactic and therapeutic remdesivir (GS-5734) treatment in the rhesus macaque model of MERS-CoV infection **
COVID-19	Chloroquine or hydroxychloroquine	Endosomal acidification fusion inhibitor	Yes	China, South Korea, India	YES	>100	>100	0	http://www.koreabiomed.com/news/articleView.html?idxno=7428	https://virology.biomedcentral.com/articles/10.1186/1743-422X-2-69 https://www.sciencedirect.com/science/article/pii/S0006291X0401339X https://factcheck.afp.com/chloroquine-has-not-been-approved-treatment-covid-19 https://www.jstage.jst.go.jp/article/bst/advpub/0/advpub_2020.010471.pdf/-char/en	Googled: Chloroquine patients corona covid
COVID-19	hydroxychloroquine + azithromycin	NA	Yes	French	YES	20+	20+	0	NA	https://techcrunch.com/2020/03/19/french-study-finds-anti-malarial-and-antibiotic-combo-could-reduce-covid-19-duration/ https://www.medrxiv.org/content/10.1101/2020.03.19.20032896v1.full.pdf https://www.mediterranean-infection.com/wp-content/uploads/2020/03/Hydroxychloroquine_final_DOL_UAA.pdf	
COVID-19	hydroxychloroquine	NA	NA	China	YES	NA	NA	NA	A loading dose of 400 mg twice daily of hydroxychloroquine sulfate given orally, followed by a maintenance dose of 200 mg given twice daily for 4 days is recommended for SARS-CoV-2 infection, as it reached three times the potency of chloroquine phosphate when given 500 mg twice daily 5 days in advance	https://academic.oup.com/cid/advance-article/doi/10.1093/cid/ciaa237/5801998 https://www.jpost.com/HEALTH/SCIENCE/Teva-donates-potential-coronavirus-treatment-to-hospitals-across-the-US-421686 https://www.thelancet.com/journals/langlo/article/PIIS2414-101X(20)30114-5/fulltext#%20	
COVID-19	Beta-D-N4-hydroxycytidine-5[γ]-isopropyl ester	NA	NA	China	YES	NA	NA	NA	NA	https://www.biorxiv.org/content/10.1101/2020.03.19.997890v1?bcid=hwAR1cCV6A9NS5SbUkqby/SCIP-ExSpOTuK0eS2XwL8vE1zcc5jg0f4	
COVID-19	Oseltamivir (Tamiflu)	NA	Yes	Wuhan, China, Austria, and Canada	YES	4	4	0	75 mg of oseltamivir taken orally every 12 hours	https://jamanetwork.com/journals/jama/fullarticle/2762452 https://www.who.int/news-room/press-releases/2020/03/19/coronavirus-spread-after-recovery.html https://pipelinereview.com/index.php/2020022673884/Proteins-and-Peptides/APEIRONs-respiratory-drug-product-to-start-pilot-clinical-trial-to-treat-coronavirus-disease-COVID-19-in-China.html https://www.apeiron-biologics.com/wp-content/uploads/2020/02/200226_APEIRON-APN01-Covid-2019-trial_in_China.pdf	Had positive RT-PCR test results 5 to 13 days later. These findings suggest that at least a proportion of recovered patients still may be virus carriers.
COVID-19	APN01	NA	Not Found	China, Austria, and Canada	YES	24	Phase I and Phase II clinical trials was safe	NA	NA	https://www.apeiron-biologics.com/wp-content/uploads/2020/02/200226_APEIRON-APN01-Covid-2019-trial_in_China.pdf	
COVID-19	Favilavir / Favipiravir / Avigan	NA	Not Found	Japan, China	YES	70 + 320 patients	70 + Positive results from clinical trial on 320 patients	0	NA	https://www.pharmaceutical-technology.com/news/china-approves-favilavir-covid-19/ https://www.upi.com/Health_News/2020/02/27/China-approves-antiviral-favilavir-to-treat-coronavirus/S291581953892/ https://www.theguardian.com/world/2020/mar/18/japanese-flu-drug-clearly-effective-in-treating-coronavirus-says-china https://endpts.com/a-japanese-flu-drug-gets-upbeat-reviews-in-china-after-small-trials-indicate-it-may-blunt-the-impact-of-covid-19/ https://www3.nhk.or.jp/nhkworld/en/news/20200318_36/	Googled: Favilavir corona covid patients
COVID-19	Lopinavir and ritonavir	NA	Yes	India, Singapore	YES	>20	>20	0	Lopinavir 200mg / Ritonavir 50mg twice a day	https://www.dailymail.co.uk/news/article-8115879/COVID-19-Australian-researchers-CURE-coronavirus.html https://www.indiatoday.in/india/article/coronavirus-health-ministry-recommends-anti-hiv-drug-combination-lopinavir-ritonavir-case-to-case-basis-1654586-2020-03-17 https://clinicaltrials.gov/ct2/show/study/NCT04307693 https://thorax.bmj.com/content/95/3/3252 https://jamanetwork.com/journals/jama/fullarticle/2762888 http://www.koreabiomed.com/news/articleView.html?idxno=7428	
COVID-19 SARS-CoV	camostat mesilate (TMPRSS2 inhibitor)	SARS-CoV-2 infection depends on the host cell factors ACE2 (explained above) and TMPRSS2. TMPRSS2 stands for "Transmembrane Protease Serine 2", and is a transmembrane protease of the serine protease family that is involved in many physiological and pathological processes. TMPRSS2 can be blocked by a clinically proven protease inhibitor-Camostat mesilate. This drug is known to inhibit TMPRSS2, and therefore could theoretically prevent viral infection of the host cell via this transmembrane protease. This therefore could be a potential therapeutic agent for COVID-19 infection. Camostat mesilate has been approved in Japan for the treatment of pancreatic inflammation. When tested on SARS-CoV-2 isolated from a patient, Camostat managed to prevent the entry of the virus into lung cells.	Not Found	Germany, Japan	When tested on SARS-CoV-2 isolated from a patient, Camostat managed to prevent the entry of the virus into lung cells.	NA	NA	NA	NA	https://marlin-prod.literatumonline.com/pb-assets/journals/research/cell/CELL_S0092-8674/2820%2930229-4.pdf https://www.thailandmedical.news/news/coronavirus-drug-research-german-researchers-identify-japanese-drug-camostat-mesilate-that-could-be-repurposed-to-treat-covid-19 https://www.cell.com/cell/fulltext/S0092-8674(20)30229-4?returnURL=https%3A%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS009286742030229%3Fshoal%3Dtrue https://www.news18.com/news/tech/hold-the-press-scientists-may-have-found-a-way-to-prevent-coronavirus-spread-2531091.html https://link.springer.com/article/10.1007/s2Fa0134-020-05985-9	Clinical Trial is going on!
SARS-CoV, MERS-CoV	niclosamide, valinomycin	Niclosamide is a parasitic worm treatment. In a study it was found to have some impact in inhibiting SARS virus replication.	Yes	NA	NA	NA	NA	NA	NA	https://www.nature.com/articles/s41467-019-13659-4#Sec2 https://pubs.acs.org/doi/10.1021/acscinfed.0c00052 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC434198/ https://www.accessdata.fda.gov/scripts/cder/da/index.cfm?event=overview.process&AppNo=018669	
COVID-19	Sofosbuvir, Ribavirin	Ribavirin functions as a broad-spectrum antiviral agent and although it has been reported to have anti-MERS-CoV activity the dose required results in toxicity. Hence, treatment with or without corticosteroids, and with Lopinavir and Ritonavir are among the combinations employed. Efficacy has been assessed in observational study, a retrospective case series, a retrospective cohort study, a prospective observational study, a prospective cohort study and a randomised controlled trial ranging from 7 to 229 participants.	Yes	South Korea	Clinical trials are ongoing with Ribavirin in combination with other drugs to treat COVID-19.	NA	NA	NA	NA	https://www.sciencedirect.com/science/article/pii/S0044320202022537via%3Dihub https://www.elsevier.com/_data/assets/pdf_file/0007/988648/COVID-19-Drug-Therapy_Mar-2020.pdf https://www.ncbi.nlm.nih.gov/pubmed/23594967 https://www.ncbi.nlm.nih.gov/pubmed/12734147 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1564166/ https://www.ncbi.nlm.nih.gov/pubmed/23937768 http://www.koreabiomed.com/news/articleView.html?idxno=7428 https://sph.nus.edu.sg/wp-content/uploads/2020/03/COVID-19-Science-Report-Therapeutics-23-Mar.pdf	Clinical trials are ongoing with Ribavirin in combination with other drugs to treat COVID-19
SARS-CoV	Interferon alfacon-1 in conjunction with corticosteroids	Corticosteroids were widely used in SARS due to their anti-inflammatory effects. Potential local and systemic immunosuppression by corticosteroids is concerning. Evidence reviews up to 2016 conclude that steroid use causes possible harm. A recent 2018 study found that MERS patients who received corticosteroids were more likely to receive invasive ventilation and had higher 90-day crude mortality.	Not Found	NA	NA	NA	NA	NA	NA	https://www.elsevier.com/_data/assets/pdf_file/0007/988648/COVID-19-Drug-Therapy_Mar-2020.pdf https://www.ncbi.nlm.nih.gov/pubmed/14693875 https://www.ajscjournals.org/doi/10.11644/acscm.201706.11200C https://sph.nus.edu.sg/wp-content/uploads/2020/03/COVID-19-Science-Report-Therapeutics-23-Mar.pdf	
COVID-19	Ampligen® (rintatolimod)	Drug for chronic fatigue syndrome/myalgic encephalomyelitis (CFS/ME)	Not Found	Japan	Clinical trials will begin	NA	NA	NA	NA	https://www.genengnews.com/uncategorized/how-to-conquer-coronavirus-top-35-treatments-in-development/ https://www.ncbi.nlm.nih.gov/pubmed/27045557 https://annals.org/aim/fullarticle/2322801/treatment-myalgic-encephalomyelitis-chronic-fatigue-syndrome-systematic-review-national-institutes	
COVID-19	Ganovo® (danoprevir) plus ritonavir	Danoprevir is potent inhibitor of Hepatitis C Virus (HCV) NS3/4A Protease and ritonavir is a approved protease inhibitors for HIV	Yes	China	YES	50 in clinical trial (NCT04231729)	NA	NA	NA	https://www.genengnews.com/uncategorized/how-to-conquer-coronavirus-top-35-treatments-in-development/ https://pubs.acs.org/doi/10.1021/jm400164c https://www.thepharmajournal.com/article/progress-of-ganovo-and-ritonavir-combo-on-novel-coronavirus-pneumonia https://clinicaltrials.gov/ct2/show/NCT04231729 https://www.biorxiv.org/content/10.1101/2020.01.31.292547v1.full.pdf	
COVID-19	ASC09/ritonavir, lopinavir/ritonavir, with or without umifenovir	ASC09 is an experimental HIV-1 protease inhibitor; ritonavir and lopinavir/ritonavir are approved protease inhibitors for HIV/AIDS; umifenovir is an approved entry inhibitor against Influenza	Yes	India, Singapore	YES	NA	NA	NA	https://www.biocontent.com/article/304313china-guidelines-point-to-hiv-protease-inhibitors-as-potential-coronavirus-treatment https://timesofindia.indiatimes.com/city/jaipur/city-docs-cure-corona-patient-with-hiv-drugs/articleshow/7458489.cms https://www.ncbi.nlm.nih.gov/pubmed/3266407 https://timesofindia.indiatimes.com/indiarajasthan-urns-into-learning-ground-as-7-covid-19-patients-declared-cured/articleshow/74644017.cms https://www.nature.com/articles/s41422-020-0282-0		
COVID-19	ASC09/oseltamivir, ritonavir/oseltamivir, oseltamivir	See above; oseltamivir is a sialidase inhibitor approved for influenza	Yes	NA	NA	NA	NA	NA	NA	https://www.nature.com/articles/d41587-020-00003-1 , NCT04261270	
COVID-19	Azudine	Experimental reverse transcriptase inhibitor drug against HIV-1/AIDS	No	China	NA	20 in clinical trial	NA	NA	NA	https://www.nature.com/articles/d41587-020-00003-1 , ChICTR2000029853	
COVID-19	Various combinations of baloxavir marboxil/ favipiravir and lopinavir/ritonavir	Baloxavir marboxil is a Cap-dependent endonuclease inhibitor and favipiravir is a guanine analog RNA-dependent RNA polymerase inhibitor approved for influenza A and B; see above	yes	China	NA	30 in clinical trial	NA	NA	NA	https://www.nature.com/articles/d41587-020-00003-1 , ChICTR2000029544, ChICTR2000029548	
COVID-19	Various combinations of darunavir/cobicistat alone or with lopinavir/ritonavir and thymosin α1	Darunavir and cobicistat are, respectively, an HIV-1 protease inhibitor and inhibitor of cytochrome P450 (CYP)3A enzyme, approved as a combination against HIV-1/AIDS. Thymosin α1 is an immune response boosting agent	yes	China	NA	30 in clinical trial	NA	NA	NA	https://www.nature.com/articles/d41587-020-00003-1 , NCT04252274, ChICTR2000029541 https://www.accessdata.fda.gov/drugsatfda_docs/nda/2015/205395Orig1s000Approv.pdf	
COVID-19	Methylprednisolone	Synthetic corticosteroid that binds to nuclear receptors to dampen proinflammatory cytokines	Yes	China	NA	100 in clinical trial	NA	NA	NA	https://www.nature.com/articles/d41587-020-00003-1 , NCT04253402 https://www.accessdata.fda.gov/drugsatfda_docs/label/2018/011153s075ibl.pdf	treatment with methylprednisolone decreased the risk of death https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2763184
COVID-19	Interferon alfa-2b alone or in combination with lopinavir/ritonavir and ribavirin	Interferon alfa-2b is a recombinant cytokine with antiviral properties; ribavirin is a guanine derivative; as above	Yes	Wuhan, China	NA	100 in clinical trial	NA	NA	NA	https://www.nature.com/articles/d41587-020-00003-1 , NCT04254874, ChICTR2000029308 https://www.accessdata.fda.gov/drugsatfda_docs/label/1997/fmasc1106971ab.pdf	
COVID-19	Camrelizumab and thymosin	Camrelizumab is a humanized monoclonal antibody (mAb) targeting PD-1	NO	Wuhan, China	NA	120 in clinical trial	NA	NA	NA	https://www.nature.com/articles/d41587-020-00003-1 , ChICTR2000029806, NCT04268853	
COVID-19	Toziluzumab	Humanized mAb targeting interleukin-6	yes	Wuhan, China	YES	21	21	0	400 mg once through an intravenous drip	https://www.nature.com/articles/d41587-020-00003-1 , ChICTR2000029765, chinaXiv:202003.00026v1 https://tinyurl.com/rthm82c	
ARDS	Bosentan		yes	NA	NA	NA	NA	NA	NA	https://www.eajm.org/en/current-pharmacological-approach-to-ards-the-place-of-bosentan-1618685 https://www.accessdata.fda.gov/drugsatfda_docs/label/2017/209279s000tbl.pdf	
COVID-19	NasoVAX	The coronavirus vaccine is being developed based on a vaccine technology platform that is similar to NasoVAX, an influenza vaccine developed by Altimmune.	yes	USA	NA	Pre-Clinical	NA	NA	NA	https://www.clinicaltrialsarena.com/analysis/coronavirus-mers-cov-drugs/ https://biobuzz.io/coronavirus-covid-19-vaccine-insights-from-altimmune-leadership-team/	
COVID-19	INO-4800	by Inovo Pharmaceuticals and Beijing Advacene Biotechnology	yes	USA	NA	Pre-Clinical	NA	NA	NA	https://www.clinicaltrialsarena.com/analysis/coronavirus-mers-cov-drugs/ https://www.inovopharma.com/news-and-media/news-releases/details/2020/INOVD-Receives-New-5-Million-Grant-to-Accelerate-Scale-Up-of-Smart-Delivery-Device-for-Its-COVID-19-Vaccine/default.aspx	
COVID-19	NP-120 (Ifenprodil)	Algenon Pharmaceuticals	yes	USA	NA	Pre-Clinical	NA	NA	NA	https://www.clinicaltrialsarena.com/analysis/coronavirus-mers-cov-drugs/ https://www.efe.com/efe/usa/comunicados/algenon-scales-up-manufacturing-of-np-120-ifenprodil-to-prepare-for-coronavirus-and-acute-lung-injury-us-clinical-trials/5009209-MULTIMEDIAE_4191506 https://www.clinicaltrialsarena.com/analysis/coronavirus-mers-cov-drugs/	
COVID-19 SARS-CoV	APN01	University of British Columbia and APEIRON Biologics	China	NA	24 in clinical trial	NA	NA	NA	NA	https://pipelinereview.com/index.php/2020022673884/Proteins-and-Peptides/APEIRONs-respiratory-drug-product-to-start-pilot-clinical-trial-to-treat-coronavirus-disease-COVID-19-in-China.html http://isi.abc.ca/2020/02/25/pip01-clinical-trial-in-china-to-test-rational-targeted-drug-as-potential-treatment-for-covid-19/ https://www.clinicaltrialsarena.com/analysis/coronavirus-mers-cov-drugs/ https://www.nih.gov/news-events/news-releases/nih-clinical-trial-investigational-vaccine-covid-19-begins	
COVID-19	mRNA-1273 vaccine	Moderna and Vaccine Research Center	USA	NA	45 in clinical trial	NA	NA	NA	NA	https://www.clinicaltrialsarena.com/analysis/coronavirus-mers-cov-drugs/ https://www.israeltoday.co.il/read/israeli-breakthrough-for-coronavirus-v	



DRUGS USED FOR THE TREATMENT OF COVID-19 INFECTION

Last update:
[16.03.2020]

LOPINAVIR / RITONAVIR	INTERFERON Beta-1	REMEDSIVIR	HYDROXY-CHLOROQUINE	TOCILIZUMAB
		 Dilution: 100-250 ml NaCl Stability: • 4 h ambient temp. • 24 h refrigerator		 Dilution: 100 ml NaCl Stability: • 4 h ambient temp. • 24 h refrigerator
<ul style="list-style-type: none"> • 200 mg / 50 mg every 12 hours (oral). • Suspension inj.: 5 ml / 12 h. 	<ul style="list-style-type: none"> • 250 mcg (1 vial) / 48 h (SC) 	<ul style="list-style-type: none"> • Dose: 200 mg (IV) day 1 • Maintenance: 100 mg/ 24 h (days 2-10) 	<ul style="list-style-type: none"> • Dose: 400 mg (IV) day 1 • Maintenance: 200 mg/ 12 h (days 2-14) 	<ul style="list-style-type: none"> • 8 mg/kg IV (max. 800mg) • New rate admin. at 12 h.
<p>MAX DURATION: 14 days</p> <p>PRECAUTIONS:</p> <ul style="list-style-type: none"> • Do not shred/crush tab. • Inhibitors of CYP3A4. • Gastrointestinal A.E • Avoid in insufficiency Severe Liver Disease. ↓ [Fosamprenavir / Ritonavir] 	<p>MAX DURATION: 14 days</p> <p>PRECAUTIONS:</p> <ul style="list-style-type: none"> • Flu-like syndrome • Avoid in psychological illness / serious depression. 	<p>MAX DURATION: 10 days</p> <p>PRECAUTIONS:</p> <ul style="list-style-type: none"> • Clean via with 30 mL NaCl after administration. • Admin. In 30-60 minutes. • Monitor possible hypotension infusion. <p>! <u>Suspend lopinavir / ritonavir and Interferon B</u></p>	<p>MAX DURATION: 14 days</p> <p>PRECAUTIONS:</p> <ul style="list-style-type: none"> • Monitor blood glucose. 	<p>MAX ADMINISTRATIONS: 3</p> <p>PRECAUTIONS:</p> <ul style="list-style-type: none"> • Admin. in 1h.
<p>SC: subcutaneous; IV: Intravenous; NaCl: NaCl 0,9%, A.E: adverse effects</p> <p>Source: https://twitter.com/smfarmhosp_smfh [16.03.2020]</p> <p> smfh_2020 @smfarmhosp_smfh</p>				