



Favipiravir + generics Review

Avigan

(Anti-influenza treatment produced by **Fujifilm**, Japan, active ingredient - **Favipiravir**)

Avifavir

(Favipiravir generic, produced by **CHEMRAR**, Russia)

Areplivir

(Favipiravir generic, produced by **PROMOMED**, Russia)

Coronavir

(Favipiravir generic, produced by **R-PHARM**, Russia)

Contents

Mention in media	_____	2
Open independent sources	_____	3
Mention on medical portals	_____	4
Other treatments	_____	5
Remdesivir information	_____	7

Mention in media

Dr. Peter Michalos: Avigan 'Quite Amazing' in Reducing COVID-19 Recovery Time

«A drug to treat coronavirus patients, Avigan, is being tested in Massachusetts and is "showing exciting" results...»

«...Avigan has shown in trials of treating COVID-19 to cut the recovery time down from **11** days to just **five**»

<https://www.newsmax.com/us/petermichalos-avigen-fda-treatment/2020/06/14/id/972102/>

Is the anti-flu drug Avigan effective in treating COVID-19?

«Recently, there has been much media **speculation** around the Japanese anti-flu drug favipiravir (brand name Avigan) being effective against SARS-CoV-2»

«Those who took favipiravir cleared the virus in an average of **4** days. Those in the control group cleared it in **11** days»

<https://www.medicalnewstoday.com/articles/anti-flu-drug-effective-in-treating-covid-19#Comparing-favipiravir-with-an-HIV-drug>

Favipiravir: Pharmacokinetics and Concerns About Clinical Trials for 2019-nCoV Infection

A clinical trial to evaluate the safety and efficacy of favipiravir in the treatment of COVID-19 (ChiCTR2000029600) was conducted in Shenzhen, with 80 patients recruited. **The results showed that the 35 patients in the favipiravir arm demonstrated significantly shorter viral clearance time as compared with the 45 patients in the control arm (median 4 days vs. 11 days).** X-ray examinations confirmed a **higher rate of improvement in chest imaging in the favipiravir arm (91.43% vs. 62%).**

<https://ascpt.onlinelibrary.wiley.com/doi/full/10.1002/cpt.1844>

96% of Covid-19 patients recover in Beacon pharma's Favipira trial

«The medication **did not result in any side effects** to the patients' livers, kidneys or carbohydrates in the blood. Moreover, neither the experimental group nor the placebo group suffered any significant side effects»

<https://tbsnews.net/coronavirus-chronicle/covid-19-bangladesh/96-covid-19-patients-recover-beacon-pharmas-favipira-trial>

Other links:

1. <https://www.theguardian.com/world/2020/mar/18/japanese-flu-drug-clearly-effective-in-treating-coronavirus-says-china>
2. <https://www.urdupoint.com/en/world/russian-health-ministry-approves-use-of-arepl-957734.html>
3. <https://www.bloomberg.com/news/articles/2020-05-31/russian-health-ministry-approves-anti-coronavirus-drug-avifavir>
4. <https://arynews.tv/en/russia-covid19-drug-coronavir/>

Open independent sources

Related clinical trials for COVID-19

Favipiravir is currently undergoing global multicenter clinical trials in treating COVID-19. The **clinical data published shows that favipiravir can clear the virus fast and alleviate the pneumonia symptom of COVID-19 patients** with high tolerance and few adverse reactions. Notably, in all related studies, the dosage of favipiravir is higher and the duration of medication administration is longer than those recommended in the instructions. Dosage for the first day is 3,200-3,600 mg and 1,200-1,600 mg for the following days, lasting for 7–14 days.

According to the favipiravir versus Kaletra trial findings of The Third People's Hospital of Shenzhen, patients taking favipiravir recover faster than those taking Lopinavir/Ritonavir. And it took a shorter median time for the former (averaging 4 days, ranging from 2.5 to 9 days) than the latter (averaging 11 days, ranging from 8 to 13 days) to turn negative in tests, with a significant difference ($P < 0.001$). The favipiravir group also showed significant improvement in chest imaging, with an improvement rate of 91.43% (32/35) versus 62.22% (28/45) of the control group ($P = 0.004$). The favipiravir treatment is an independent influencing factor for imaging improvement and

virus clearing. In the meantime, patients in the favipiravir group have high tolerance and few adverse reactions.

Another preliminary report of research carried out at Fujita Medical University, Japan on a sample of 2,158 patients with COVID-19 showed that almost all favipiravir-treated patients' symptoms were improved: 70% of the patients with mild to moderate symptoms and 40% of those with severe symptoms recovered after a 7-day antiviral treatment, and 60% of the patients with severe symptoms recovered after a 14-day antiviral treatment.

Favipiravir has also produced encouraging results in an early clinical trial in Russia. Early data from the study showed that 60 percent of the 40 patients from six medical centers took favipiravir tablets and tested negative for the virus after **five** days. **It was noticed that patients in the favipiravir group showed a faster improvement in the general health and clinical condition, which may lead to earlier discharge from hospital and reduce the burden on medical facilities by 30-40% in the near future.** Thanks to the administration of favipiravir, most patients are not infectious as early as the fifth day of treatment, which is critical to containing the pandemic and ensuring a swift return to normal life.

In experiments in animals favipiravir has shown activity against West Nile virus, yellow fever virus, foot-and-mouth disease virus as well as other flaviviruses, arenaviruses, bunyaviruses and alphaviruses. Activity against enteroviruses and Rift Valley fever virus has also been demonstrated. Favipiravir has showed limited efficacy against Zika virus in animal studies, but was less effective than other antivirals such as MK-608. The agent has also shown some efficacy against rabies, and has been used experimentally in some humans infected with the virus.

<https://en.wikipedia.org/wiki/Favipiravir>

Favipiravir is sold under the brand names Avigan (アビガン, Abigan), **Avifavir**, **Areplivir**, **Coronavir**, FabiFlu, and Favipira.

Mention on medical portals

1. <https://pubchem.ncbi.nlm.nih.gov/compound/Favipiravir>
2. <https://www.ikrispharmanetwork.com/favipiravir/>
3. <https://pubmed.ncbi.nlm.nih.gov/28769016/>
4. <https://pubmed.ncbi.nlm.nih.gov/28769016/>

Other treatments

1. **Baricitinib** Phase 3 studies are in progress to determine the effectiveness of a Janus kinase (JAK) inhibitor called baricitinib (marketed under the brand name Olumiant for the treatment of rheumatoid arthritis) in the treatment of COVID-19 patients.
2. **Bemcentinib** An AXL kinase inhibitor called bemcentinib has been fast-tracked in a UK Phase II clinical trial to study its effectiveness in the treatment of hospitalized patients with COVID-19. Bemcentinib has previously been studied in cancer patients and has been shown to be safe and well-tolerated. It has also been reported to exhibit potent antiviral activity in preclinical models against several enveloped viruses, including Ebola and Zika virus, and recent data have expanded this to include SARS-CoV-2.
3. **Bevacizumab** A VEGF inhibitor called bevacizumab (marketed under the brand name Avastin for certain types of cancer) being studied as a treatment for acute lung injury (ALI) and acute respiratory distress syndrome (ARDS) in critically ill patients with COVID-19 pneumonia at the Qilu Hospital of Shandong University in Jinan, China.
4. **Chloroquine phosphate** The older anti-malaria drug chloroquine has been shown to have a wide range of antiviral effects, including anti-coronavirus. Studies in Guangdong Province in China suggest that chloroquine may help improve patient outcomes in people with novel coronavirus pneumonia.
5. **Colchicine** An older anti-inflammatory drug called colchicine is being studied to prevent complications of COVID-19 in high risk patients. Colchicine has long been used in the treatment of gout.
6. **Dexamethasone** The cheap and widely available steroid dexamethasone reduced the risk for death among seriously ill COVID-19 patients by up to a third, according to researchers at the University of Oxford in England. The drug did not appear to help patients with less serious illness.
7. **EIDD-2801** A team of researchers at UNC-Chapel Hill is hopeful that a broad spectrum oral antiviral called EIDD-2801 could be used as a potential prophylactic or treatment for COVID-19 and other coronaviruses. Ridgeback Biotherapeutics has licensed EIDD-2801 and has received permission from the FDA to begin patient trials.
Update: May 26, 2020 -- Ridgeback Biotherapeutics and Merck enter collaboration agreement to develop EIDD-2801.
8. **Favipiravir** An antiviral drug called favipiravir which was reported February 17, 2020 to have received marketing approval in China for the treatment of influenza, was also approved for use in clinical trials as a treatment for novel coronavirus pneumonia. On March 31, 2020, Fujifilm announced the start of a Phase 3 clinical trial of Avigan (favipiravir) on COVID-19 patients in Japan. Avigan is approved in Japan for use as an antiviral in the treatment of influenza. On April 9, 2020 -- Fujifilm announced the start of a Phase 2 clinical trial of favipiravir in approximately 50 COVID-19 patients in the U.S. On June 19, 2020, Glenmark Pharmaceuticals Limited announced the marketing approval of favipiravir (FabiFlu®) for the treatment of mild to moderate COVID-19 patients in India.

9. **Fingolimod** An approved drug called fingolimod (marketed under the brand name Gilenya for the treatment of relapsing forms of multiple sclerosis) is being studied as a treatment for COVID-19 at the First Affiliated Hospital of Fujian Medical University in Fuzhou, China.
10. **Hydroxychloroquine and azithromycin** In a small study commissioned by the French government, 20 patients with COVID-19 were treated with a combination of the anti-malaria drug hydroxychloroquine and the macrolide antibacterial drug azithromycin (Zithromax). Results showed that all patients taking the combination were virologically cured within 6 days of treatment.
Update: May 14, 2020 -- NIH begins clinical trial of hydroxychloroquine and azithromycin to treat COVID-19 (NIH Press Release)
11. **Hydroxychloroquine sulfate** It was reported in the journal *Clinical Infectious Diseases* on March 9 that the malaria drug hydroxychloroquine was effective in killing the coronavirus in laboratory experiments. Hydroxychloroquine was first approved by the FDA in 1995 under the brand name Plaquenil, and it is also used in the treatment of patients with lupus and arthritis. In March 2020, the US FDA issued an emergency use authorization (EUA) to allow the emergency use of hydroxychloroquine sulfate supplied from the Strategic National Stockpile (SNS) for the treatment of COVID-19 in certain hospitalized patients. On June 15, 2020, the FDA revoked the EUA.
12. **Ivermectin** An anti-parasitic drug called ivermectin has been shown to be effective against the SARS-CoV-2 virus in an in-vitro laboratory study by researchers at Monash University in Melbourne, Australia. Further clinical trials need to be completed to confirm the effectiveness of the drug in humans with COVID-19.
13. **Leronlimab** A CCR5 antagonist called leronlimab has shown promise in calming the 'cytokine storm' in a small number of critically ill COVID-19 patients hospitalized in the New York area.
14. **Lopinavir and ritonavir** A drug combination called lopinavir/ritonavir approved to treat HIV under the brand name Kaletra is being studied in combination with the flu drug oseltamivir (Tamiflu) in Thailand. It was reported on February 18, 2020 that an elderly Chinese woman, the first patient to receive the "Thai cocktail" in Bangkok's Rajvithi Hospital, had made a complete recovery after suffering from severe COVID-19-related pneumonia.
Update: March 18, 2020 -- According to a study in the *New England Journal of Medicine*, the lopinavir/ritonavir combination showed no benefit over standard care in hospitalized adult patients with severe COVID-19.
15. **Methylprednisolone** A widely used glucocorticoid called methylprednisolone is being studied for safety and effectiveness in the treatment of novel coronavirus pneumonia in a number of hospitals in the Hubei province of China.
16. **Remdesivir** An investigational antiviral drug called remdesivir is being studied in clinical trials in China, the United States, and the United Kingdom. Remdesivir has demonstrated in vitro and in vivo activity in animal models against the viral pathogens that cause MERS and SARS, which are coronaviruses structurally similar to SARS-CoV-2.
17. **Sarilumab** An interleukin-6 (IL-6) receptor antagonist called sarilumab (marketed under the brand name Kevzara for the treatment of rheumatoid arthritis) is being studied as a potential

treatment for acute respiratory distress syndrome (ARDS) in patients critically ill from COVID-19.

18. **STC3141** An investigational drug called STC3141 has been approved to commence phase II clinical research in Australia for the treatment of acute respiratory distress syndrome (ARDS) suffered by COVID-19 patients.
19. **Tocilizumab** An interleukin-6 receptor antagonist called tocilizumab (marketed under the brand name Actemra for the treatment of rheumatoid arthritis and other inflammatory conditions) is being studied in a number of locations worldwide for the treatment of patients with COVID-19.
20. **Umifenovir** An antiviral drug called umifenovir (marketed in Russia under the brand name Arbidol, and also available in China for the treatment of influenza) is being studied in China and other countries as a treatment for COVID-19.

Remdesivir information

Remdesivir Uses, Side Effects & Warnings

«**Remdesivir has not been approved to treat coronavirus or COVID-19***. It is not yet known if remdesivir is an effective treatment for any condition.

The FDA has authorized emergency use of remdesivir only in people with COVID-19 who are in a hospital.»

* as of June 15, 2020

<https://www.drugs.com/mtm/remdesivir.html>

Remdesivir ... is a broad-spectrum antiviral medication developed by the Gilead Sciences

«Earlier studies found antiviral activity against several RNA viruses including SARS coronavirus and MERS coronavirus, **but it is not approved for any indication**. Remdesivir was originally developed to treat hepatitis C and was then tested against Ebola virus disease and Marburg virus disease, **but was ineffective for all of these viral infections.**»

<https://en.wikipedia.org/wiki/Remdesivir>

Stanford Medicine trial to test favipiravir for treating COVID-19 outpatients

Researchers want to determine whether Favipiravir, an oral drug, is effective in reducing the severity of symptoms and shortening the duration of COVID-19.

«Stanford participated in earlier clinical trials that found that another antiviral, remdesivir, **was effective in treating coronavirus patients. That drug has since been approved for use in the U.S.** but is not available orally and, so far, can be administered only intravenously and only to those in a hospital.

“Favipiravir could be very important for symptom relief, especially for patients with mild cases who can have symptoms for a long time,” Subramanian said. “**We’ve seen a number of symptoms continue, such as coughs, shortness of breath, fatigue.**”»

<https://med.stanford.edu/news/all-news/2020/06/stanford-medicine-trial-tests-favipiravir-for-covid-19.html>