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# Novel Coronavirus (COVID-19) Treatment Options

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## Abstract

Coronavirus also called SARS-COV-2 showed highly pathogenic, caused severe or even life-threatening diseases, and still transmitted from person-to-person. Given fast evolution of the COVID-19 outbreak, world health organization declared its outbreak as pandemic. Until now, no drugs or biologics have been proven to be effective for the prevention or treatment of COVID-19. Mainstream medicine has little in its arsenal for viral diseases. Some promising agents are selectively RNA inhibitors, an antimalarial agent, an HIV protease inhibitor, and an influenza viral neuraminidase inhibitor, which showed good clinical efficacy in treating COVID-19.

**Keywords:** RNA virus; Coronavirus; COVID-19; World Pandemic

## Short Review

Coronavirus are enveloped, positive-stranded RNA viruses with nucleocapsid [1-3]. So far it appears that COVID-19 predominantly affects the lower respiratory tract leading to break down of the lung cells, with infiltration of fluid, hemorrhage, and inflammatory cells into the alveolar space that manifest the disease further [2,4-6]. As a result of inflammatory/repair process, these areas develop pneumonia [7]. Coronaviruses uses angiotensin-converting enzyme 2 (ACE2) to target cells on the epithelium of the lungs, intestine, and blood vessels [5,8,9].

Many viruses require surface proteins for cell fusion and entry [8,10]. Coronavirus has three major proteins, named, spike (S) protein, envelope (E) protein, nucleocapsid protein (N) and membrane (M) protein [1,2,8,9]. The N is a structural protein that binds to the coronavirus RNA genome, thus creating a shell around the nucleic materials [2,8,9]. The S protein is responsible for host infection by facilitating the attachment and enables viral entry into the host cell [2,9,10]. ACE2 is an endogenous membrane protein that facilitates COVID-19 infection (**Figure: 1**) [8,10].

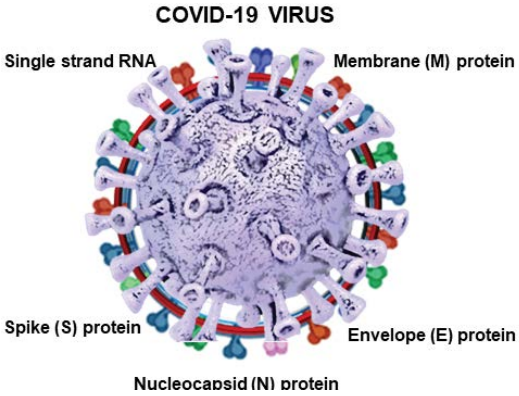


**Figure 1:** Illustration of COVID-19 VIRUS.

There is currently no vaccine or treatment for coronavirus disease [11,12]. The pandemic of coronavirus disease has accelerated the race for development of vaccines and other therapeutic options [11,12]. Chloroquine, a drug used to treat malaria and arthritis, was approved by the US Food and Drug Administration to be tested as a treatment for coronavirus [12]. Chloroquine is being tested in various clinical trials, while other antivirals drugs are also planned to be fast-tracked for testing for coronavirus such as Favilavir and others as mentioned in Table 1 [2,11-15]. There is no specific medicine to prevent or treat coronavirus disease. Listed drugs in table one may be used as supportive care to help the patients.

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**Table1:** Here is a list of the major coronavirus drugs that have the potential to become major coronavirus vaccines or antivirals for treating the coronavirus infection.

| Drugs/Compounds | Mechanism of Action | Classification |
|---|---|---|
| Favipiravir/Galidesivir/ Remdesivir | Potently inhibits the RNA-dependent RNA polymerase | Antiviral |
| Epetraborole hydrochloride | Inhibits growth | Antibacterial |
| Saquinavir/ Nelfinavir | Protease inhibitor | Antiviral |
| Carfilzomib | Proteasome inhibitor | Antiviral |
| Zanamivir | Neuraminidase inhibitor | Antiviral |
| Ribavirin | Broad spectrum antiviral agent | Antiviral |
| Bimosiamose | Inhibitor of S protein and ACE2 | Antiviral, Anti-inflammatory |
| Chloroquine | Anti-malarial drug | An antimalarial agent |
| Actemra | Inhibits the RNA-dependent RNA polymerase | Antiviral, Anti-inflammatory |
| TJM2/AT-100/TZLS-501/BPI-002/ INO-4800 | Neutralizing antibody, inhibit virus, vaccine | Antibody, Anti-inflammatory, Recombinant proteins |

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