

Novel Coronavirus (COVID-19) Treatment Options

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Abstract

Corona virus 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

Mini Review

Corona virus are enveloped, positive-stranded RNA viruses with nucleocapsid [1,2]. 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]. As a result of inflammatory/repair process, these areas develop pneumonia [5]. Corona viruses uses angiotensin-converting enzyme 2 (ACE2) to target cells on the epithelium of the lungs, intestine, and blood vessels [4,6,7]. Many viruses require surface proteins for cell fusion and entry [6,8]. Coronavirus has three major proteins, named, spike (S) protein, envelope (E) protein, nucleocapsid protein (N) and membrane (M) protein [1,2,6,7]. The N is a structural protein that binds to the coronavirus RNA genome, thus creating a shell around the nucleic materials [2,6,7]. The S protein is responsible for host infection by facilitating the attachment and enables viral entry into the host cell [2,7,8]. ACE2 is an endogenous membrane protein that facilitates COVID-19 infection (Figure 1) [6,8]. There is currently no vaccine or treatment for corona virus disease [9,10]. The pandemic of corona virus disease has accelerated the race for development of vaccines and other therapeutic options

[9,10]. 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 [10]. Chloroquine is being tested in various clinical trials, while other antiviral drugs are also planned to be fast-tracked for testing for corona virus such as Favilavir and others as mentioned in Table 1 [2,9-13]. There is no specific medicine to prevent or treat corona virus disease. Listed drugs in table one may be used as supportive care to help the patients.

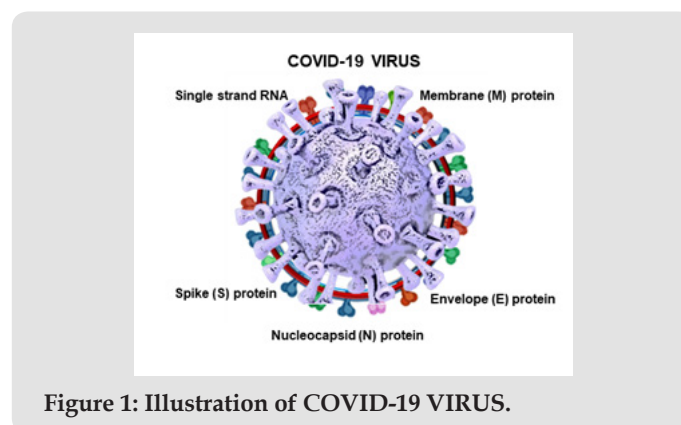


Figure 1: Illustration of COVID-19 VIRUS.

Table 1: Here is a list of the major corona virus drugs that have the potential to become major corona virus vaccines or antivirals for treating the corona virus 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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MU: Conceptualization and writing of review manuscript.

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Consent for publication

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Competing interests

The author declares that he has no competing interests.

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