

Review Article

CORONAVIRUS PANDEMIC FROM 2020 TILL TODAY

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Abstract

Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus. Most people infected with the COVID-19 virus will experience mild to moderate respiratory illness and recover without requiring special treatment. Older people, and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious illness. The best way to prevent and slow down transmission is to be well informed about the COVID-19 virus, the disease it causes and how it spreads. Protect yourself and others from infection by washing your hands or using an alcohol-based rub frequently and not touching your face. The COVID-19 virus spreads primarily through droplets of saliva or discharge from the nose when an infected person coughs or sneezes, so it's important that you also practice respiratory etiquette (for example, by coughing into a flexed elbow). If COVID-19 is spreading in your community, stay safe by taking some simple precautions, such as physical distancing, wearing a mask, keeping rooms well ventilated, avoiding crowds, cleaning your hands, and coughing into a bent elbow or tissue. Check local advice where you live and work. In this review paper, we tried to cover all till date data of infected people worldwide, precautions which are necessary to be safe from the disease and moreover last but not least we covered medical precautions including vaccine, its doses and precaution after vaccinated.

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1. Introduction

Coronaviruses are a large family of respiratory viruses, known to cause illness ranging from the common cold to more severe illnesses such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). The first human cases of COVID-19, the disease caused by the novel coronavirus causing COVID-19, subsequently named SARS-CoV-2 were first reported by officials in Wuhan City, China, in December 2019. The current outbreak

has been caused by a strain of coronavirus that had not previously detected anywhere in the world before the outbreak was reported in Wuhan, China in December 2019. Coronaviruses are a large family of viruses that are known to cause illness ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). Viruses are named based on their genetic structure to facilitate the development of diagnostic tests, vaccines and medicines. Virologists and the wider scientific community do this work, so viruses are named by the

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International Committee on Taxonomy of Viruses (ICTV). This review paper provides a general introduction to Covid-19 and emerging respiratory viruses and is intended for public health professionals, incident its effectiveness worldwide till March 2021. Total number of cases according to the data of WHO, its cure on personal working.

2. What are Coronaviruses and how do they invade cells?

Coronaviruses are single-stranded RNA viruses, about 120 nanometers in diameter. They are susceptible to mutation and recombination and are therefore highly diverse. There are about 40 different varieties and they mainly infect human and non-human mammals and birds. They reside in bats and wild birds, and can spread to other animals and hence to humans. The virus that causes COVID-19 is thought to have originated in bats and then spread to snakes and pangolins and hence to humans, perhaps by contamination of meat from wild animals, as sold in China's meat markets.

The corona-like appearance of coronaviruses is caused by so-called spike glycoproteins, or peplomers, which are necessary for the viruses to enter host cells. The spike has two subunits; one subunit, S1, binds to a receptor on the surface of the host's cell; the other subunit, S2, fuses with the cell membrane. The cell membrane receptor for both SARS-CoV-1 and SARS-CoV-2 is a form of angiotensin converting enzyme, ACE-2, different from the enzyme that is inhibited by conventional ACE-1 inhibitors, such as Enalapril and Ramipril. Briefly, the S1 subunit of the spike binds to the ACE-2 enzyme on the cell membrane surface. A host transmembrane serine protease, TMPRSS2, then activates the spike and cleaves ACE-2. TMPRSS2 also acts on

the S2 subunit, facilitating fusion of the virus to the cell membrane. The virus then enters the cell. Inside the cell the virus is released from endosomes by acidification or the action of an intracellular cysteine protease and cathepsin. A model and a more detailed description of these events is shown in Figure - 1.

- 1) The coronavirus approaches the cell membrane
- 2) An S1 subunit (red) at the distal end of a glycoprotein spike of the virus binds to a membrane-bound molecule of ACE-2 (blue)
- 3) As more S1 subunits of the glycoprotein spikes bind to membrane-bound molecules of ACE-2, the membrane starts to form an envelope around the virus (an endosome)
- 4) The process continues until the endosome is complete
- 5) The virus can enter the cell in two ways:(a) A cell membrane-bound serine protease (brown), TMPRSS2, cleaves the virus's S1 subunits (red) from its S2 subunits (black) and also cleaves the ACE-2 enzymes; the endosome enters the cell (endocytosis), where the virus is released by acidification or the action of another protease, cathepsin; (b) The same serine protease, TMPRSS2, causes irreversible conformational changes in the virus's S2 subunits, activating them, after which the virus fuses to the cell membrane and can be internalized by the cell. A serine protease inhibitor, camostat mesylate, used in Japan to treat chronic pancreatitis, inhibits the TMPRSS2 and partially blocks the entry of SARS-CoV-2 into bronchial epithelial cells *in vitro*.

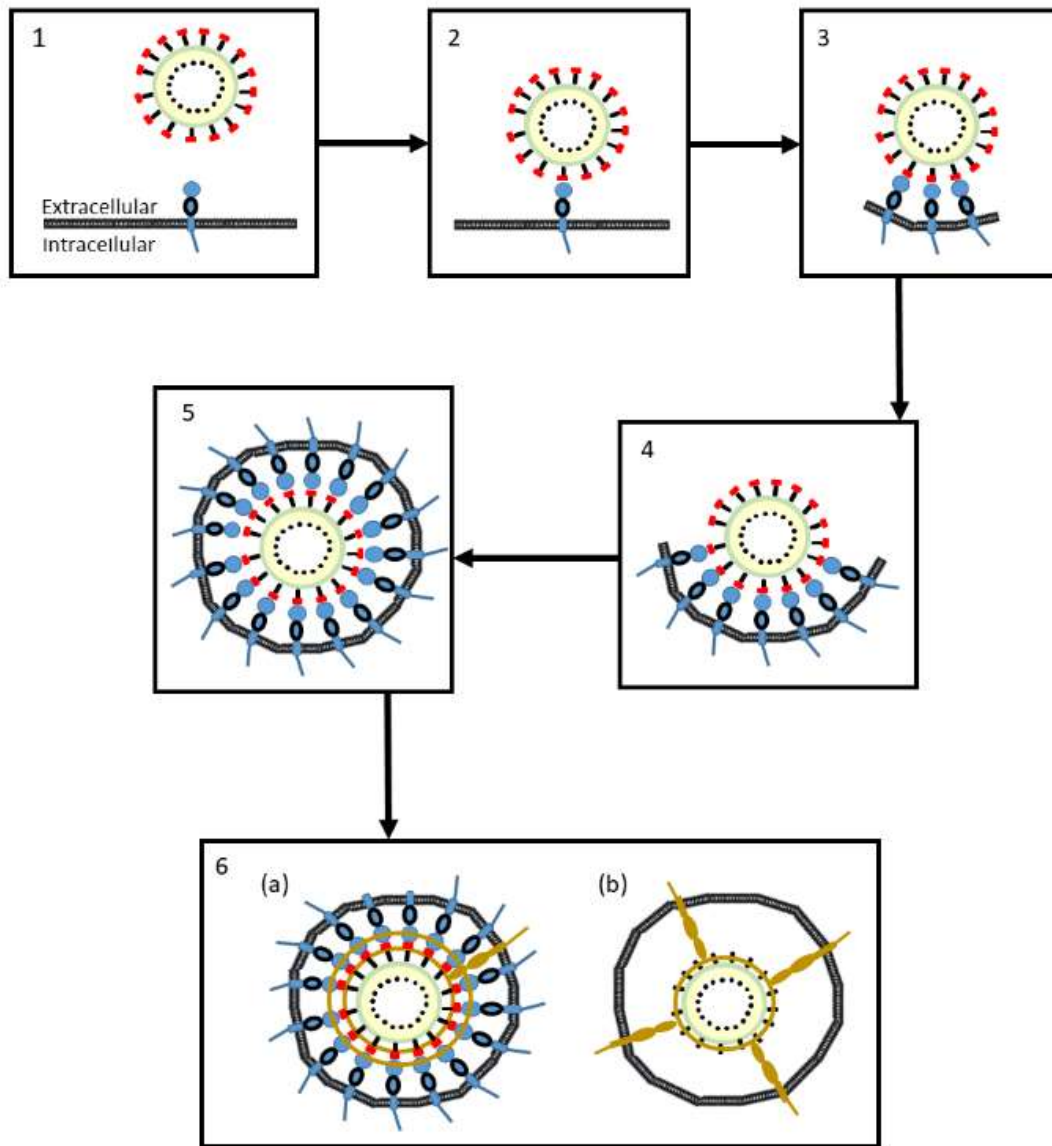


Figure – 1: A proposed model of the mechanisms whereby Coronavirus SRA-CoV-2 enters cells

3. Research interest in Coronaviruses

The first coronaviruses found to infect humans were called 229E and OC43, but they caused very mild infections, similar to the common cold. It was not until the outbreaks of SARS (severe acute respiratory syndrome) and then MERS (the Middle Eastern respiratory syndrome or camel flu) that it was appreciated that they could cause serious human infections. Those two infections are thought to have come from bats via civet cats and camels. This awakening of interest in coronaviruses at different times is reflected in the pattern of publications about them.

After the initial description of coronaviruses in 1968 there was a slow increase in the numbers of publications dealing with them, followed by two peaks, after two epidemics: the SARS coronavirus epidemic in 2003–4 and an outbreak of porcine epidemic diarrhoea in North America in 2013 (Figure 4). Identification of the first cases of MERS in Saudi Arabia in 2012, and then elsewhere (e.g. in South Korea in 2015), also caused by a coronavirus, may also have contributed. We have previously highlighted the fact that the major peaks of interest in the coronaviruses have followed major infections in humans and animals. In my BMJ opinion column

on 31 January this year, where some of this article has previously appeared. I wrote that I expected to see another peak in the numbers of publications following the current epidemic. My original graph ended with the 2019 figures. I have now added the latest numbers, from 2020, to the graph, which shows that my prophecy has already been fulfilled.

More publications on Coronaviruses have been logged in Pubmed in the first 12 weeks of 2020 than in any previous complete year. The difficulty in preventing and treating the infection is matched by the difficulty in keeping up with the published literature.

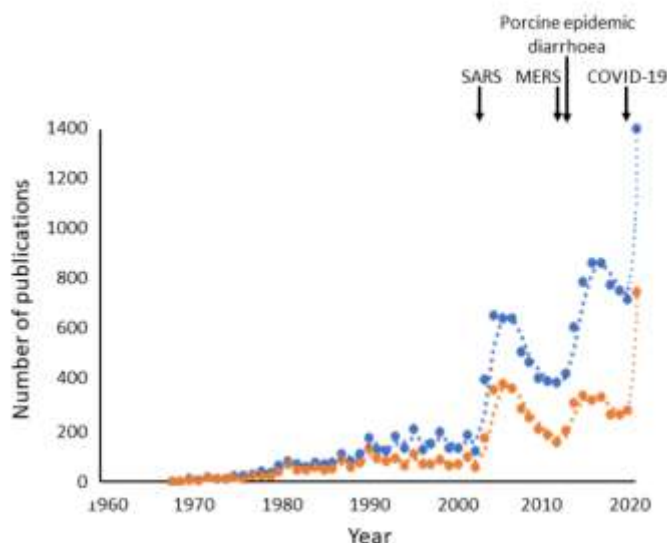


Figure – 2: Number of publications with Coronaviruses as text words (Blue Colour) or in titles (orange Colour), each point represents one year, but the rightmost points cover 2020

Table – 3: Taxonomy of Corona Virus that can cause disease in Human being

Genus	Varieties causing human disease
Alphacoronaviruses	Human coronavirus 229E (HCoV-229E)
Betacoronaviruses	<ul style="list-style-type: none"> ● Human coronavirus HKU1 ● Human coronavirus NL63 (HCoV-NL63, New Haven coronavirus) ● Human coronavirus OC43 (HCoV-OC43) ● Middle East respiratory syndrome-related coronavirus (MERS-CoV or HCoV-EMC; the cause of MERS) ● Severe acute respiratory syndrome coronavirus (SARS-CoV-1, the cause of SARS) ● Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2 or 2019-nCoV, the cause of COVID-19)

4. Symptoms

The most common symptoms of COVID-19 are

- Fever
- Dry cough
- Fatigue

Other symptoms that are less common and may affect some patients include:

- Loss of taste or smell
- Nasal congestion
- Conjunctivitis (also known as red eyes)
- Sore throat
- Headache
- Muscle or joint pain
- Different types of skin rash
- Nausea or vomiting
- Diarrhea
- Chills or dizziness

Symptoms of severe COVID-19 disease include:

- Shortness of breath
- Loss of appetite
- Confusion
- Persistent pain or pressure in the chest
- High temperature (above 38 °C)

Other less common symptoms are

- Irritability
- Confusion
- Reduced consciousness (sometimes associated with seizures)
- Anxiety
- Depression
- Sleep disorders
- More severe and rare neurological complications such as strokes, brain inflammation, delirium and nerve damage.

People of all ages who experience fever and/or cough associated with difficulty breathing or shortness of breath, chest pain or pressure, or loss of speech or movement should seek medical care immediately. If possible, call your health care provider, hotline or health facility first, so you can be directed to the right clinic.

Among those who develop symptoms, most (about 80%) recover from the disease without needing hospital treatment. About 15% become seriously ill and require oxygen and 5% become critically ill and need intensive care. Complications leading to death may include respiratory failure, acute respiratory distress syndrome (ARDS), sepsis and septic shock, thromboembolism, and/or multiorgan failure, including injury of the heart, liver or kidneys. In rare situations, children can develop a severe inflammatory syndrome a few weeks after infection.

5. Risk factors of Covid-19

People aged 60 years and over, and those with underlying medical problems like high blood pressure, heart and lung problems, diabetes, obesity or cancer, are at higher risk of developing serious illness. However, anyone can get sick with COVID-19 and become seriously ill or die at any age. Some people who have had COVID-19, whether they have needed hospitalization or not, continue to experience symptoms, including fatigue, respiratory and neurological symptoms. WHO is working with our Global Technical Network for Clinical Management of COVID-19, researchers and patient groups around the world to design and carry out studies of patients beyond the initial acute course of illness to understand the proportion of patients who have long term effects, how long they persist, and why they occurs. These studies will be used to develop further guidance for patient care.

6. When should one go for Covid -19 test?

Anyone with symptoms should be tested, wherever possible. People who do not have symptoms but have had close contact with someone who is, or may be, infected may also consider testing – contact your local health guidelines and follow their guidance. While a person is waiting for test results, they should remain isolated from others. Where testing capacity is limited, tests should first be done for those at higher risk of infection, such as health workers, and those at higher risk of severe illness

such as older people, especially those living in seniors' residences or long-term care facilities.

7. Definition of Quarantine and Isolation

Both isolation and quarantine are methods of preventing the spread of COVID-19.

Quarantine is used for anyone who is a contact of someone infected with the SARS-CoV-2 virus, which causes COVID-19, whether the infected person has symptoms or not. Quarantine means that you remain separated from others because you have been exposed to the virus and you may be infected and can take place in a designated facility or at home. For COVID-19, this means staying in the facility or at home for 14 days.

Isolation is used for people with COVID-19 symptoms or who have tested positive for the virus. Being in isolation means being separated from other people, ideally in a medically facility where you can receive clinical care. If isolation in a medical facility is not possible and you are not in a high-risk group of developing severe disease, isolation can take place at home. If you have symptoms, you should remain in isolation for at least 10 days plus an additional 3 days without symptoms. If you are infected and do not develop symptoms, you should remain in isolation for 10 days from the time you test positive.

8. Lockdown conditions

Eight states, including Maharashtra, Karnataka and Punjab, account for 84.5 per cent of the 68,020 fresh cases recorded in the country in the last 24 hours, the Union Health Ministry said Monday. Maharashtra has reported the highest daily rise of 40,414 Covid-19 cases, followed by 3,082 in Karnataka, 2,870 in Punjab, 2,276 in Madhya Pradesh, 2,270 in Gujarat, 2,216 in Kerala, 2,194 in Tamil Nadu and 2,153 in Chhattisgarh, the ministry informed. With 291 deaths in the last 24 hours, the overall death toll touched 1,61,843. There are 5,21,808 active coronavirus cases in the country while as many as 1,13,55,993 people have recovered from the

disease. Meanwhile, as the number of currently active Covid-19 cases touched a new record in Maharashtra, the **state appeared headed towards a lockdown** in the coming week, officials told The Indian Express on Sunday. The lockdown option was discussed at a meeting Chief Minister Uddhav Thackeray had with Health Minister Rajesh Tope, Health Secretary Dr Pradeep Vyas, and the Covid Task Force to consider ways to bring the surge in cases under control. Over the last three days, Maharashtra has recorded more than 1.13 lakh new infections; 40,414 new cases were detected on Sunday.

9. Precautions for Covid -19

Wear a Mask

- a) Everyone 2 years and older should wear masks in public.
- b) Masks should be worn in addition to staying at least 6 feet apart, especially around people who don't live with you.
- c) If someone in your household is infected, people in the household should take precautions including wearing masks to avoid spread to others.
- d) Wash your hands or use hand sanitizer before putting on your mask.
- e) Wear your mask over your nose and mouth and secure it under your chin.
- f) Fit the mask snugly against the sides of your face, slipping the loops over your ears or tying the strings behind your head.
- g) If you have to continually adjust your mask, it doesn't fit properly, and you might need to find a different mask type or brand.
- h) Make sure you can breathe easily.
- i) Masks Are Required on planes, buses, trains, and other forms of public transportation traveling into, within, or out of the United States and in U.S. transportation hubs such as airports and stations.

Stay 6 feet away from People

- **Inside your home:** Avoid close contact with people who are sick. If possible, maintain 6 feet between the person who is sick and other household members.
- **Outside your home:** Put 6 feet of distance between yourself and people who don't live in your household. Remember that some people without symptoms may be able to spread virus. Stay at least 6 feet (about 2 arm lengths) from other people. Keeping distance from others is especially important for people who are at higher risk of getting very sick.

Get Vaccinated

- Authorized COVID-19 vaccines can help protect you from COVID-19.
- You should get a COVID-19 vaccine when it is available to you.
- Once you are fully vaccinated, you may be able to start doing some things that you had stopped doing because of the pandemic.

Avoid crowd and poorly ventilated Space

- Being in crowds like in restaurants, bars, fitness centers, or movie theaters puts you at higher risk for COVID-19.
- Avoid indoor spaces that do not offer fresh air from the outdoors as much as possible.
- If indoors, bring in fresh air by opening windows and doors, if possible.

Personal Hygiene Practices

- Wash your hands often with soap and water for at least 20 seconds especially after you have been in a public place, or after blowing your nose, coughing, or sneezing.
- It's especially important to wash:
 - ✓ Before eating or preparing food
 - ✓ Before touching your face
 - ✓ After using the restroom
 - ✓ After leaving a public place

- ✓ After blowing your nose, coughing, or sneezing
- ✓ After handling your mask
- ✓ After changing a diaper
- ✓ After caring for someone sick
- ✓ After touching animals or pets
- If soap and water are not readily available, use a hand sanitizer that contains at least 60 % alcohol. Cover all surfaces of your hands and rub them together until they feel dry.
- Avoid touching your eyes, nose, and mouth with unwashed hands.
- Cover Coughs and Sneezes.
- Always cover your mouth and nose with a tissue when you cough or sneeze or use the inside of your elbow and do not spit.
- Throw used tissues in the trash.
- Immediately wash your hands with soap and water for at least 20 seconds. If soap and water are not readily available, clean your hands with a hand sanitizer that contains at least 60 % alcohol.
- Clean and disinfect frequently touched surfaces daily. This includes tables, doorknobs, light switches, countertops, handles, desks, phones, keyboards, toilets, faucets, and sinks.
- If surfaces are dirty, clean them. Use detergent or soap and water prior to disinfection. Then, use a household disinfectant. Use products from EPA's List N: Disinfectants for Coronavirus (COVID-19) external icon according to manufacturer's labelled directions.
- Monitor your health daily. Be alert for symptoms. Watch for fever, cough, shortness of breath, or other symptoms of COVID-19. Especially important if you are running essential errands, going into the office or workplace, and in settings where it may be difficult to keep a physical distance of 6 feet.
- Take your temperature if symptoms develop. Don't take your temperature within 30 minutes of exercising or after

taking medications that could lower your temperature, like acetamine.

10. References

- 1) Al-Salama ZT and Scott LJ. (2018). Baricitinib: A Review in Rheumatoid Arthritis. *Drugs*, 78:761- 772.
- 2) American Academy of Pediatrics Committee on Drugs. (2001). Transfer of drugs and other chemicals into human milk. *Pediatrics*, 108:776- 789.
- 3) Borba MGS, Val FFA and Sampaio VS. (2020). Effect of High vs Low Doses of Chloroquine Diphosphate as Adjunctive Therapy for Patients Hospitalized with Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) Infection: A Randomized Clinical Trial. *JAMA Netw Open*, 3: e208857.
- 4) Chakravarty T, Makkar RR and Ascheim DD. (2017). AL-Logeneic Heart STem Cells to Achieve Myocardial Regeneration (ALLSTAR) Trial: Rationale and Design. *Cell Transplant*, 26:205-214.
- 5) Chen P, Nirula A and Heller B. (2020). SARS-CoV-2 Neutralizing Antibody LY-CoV555 in Outpatients with Covid-19. *New English Journal of Medicine*, 22: 112 – 120.
- 6) Duan YJ, Liu Q and Zhao SQ. (2020). The Trial of Chloroquine in the Treatment of Corona Virus Disease 2019(COVID-19) and Its Research Progress in Forensic Toxicology. *Fa Yi Xue Za Zhi*, 25: 36 - 42.
- 7) Ducharme J and Farinotti R. (1996). Clinical pharmacokinetics and metabolism of chloroquine. *Clinical Pharmacokinetics*, 31: 257- 274.
- 8) Fantini J, Scala CD, Chahinian H and Yahi N. (2020). Structural and molecular modelling studies reveal a new mechanism of action of chloroquine and hydroxy chloroquine against SARS-CoV-2 infection. *International Journal of Antimicrobial Agents*, 20: 105960.
- 9) Gao J, Tian Z and Yang X. (2020). Breakthrough: Chloroquine phosphate has shown apparent efficacy in treatment of COVID-19 associated pneumonia in clinical studies. *Bioscience Trends*, 14:72-73.
- 10) Han S, Sun HM, Hwang KC and Kim SW. (2015). Adipose-Derived Stromal Vascular Fraction Cells: Update on Clinical Utility and Efficacy. *Critical Reviews in Eukaryotic Gene Expression*, 25:145- 152.
- 11) Hu J, Xu Q, McTiernan C, Lai YC, Osei-Hwedieh D and Gladwin M. (2015). Novel Targets of Drug Treatment for Pulmonary Hypertension. *American Journal of Cardiovascular Drugs*, 15: 225 - 234.
- 12) Jones BE, Brown-Augsburger PL and Corbett KS. (2020). LY-CoV555, a rapidly isolated potent neutralizing antibody, provides protection in a non-human primate model of SARS-CoV-2 infection. *BioRxiv*, 20: 205 – 212.
- 13) Mauthe M, Orhon I and Rocchi C. (2018). Chloroquine inhibits autophagic flux by decreasing autophagosome - lysosome fusion. *Autophagy*, 14: 1435 - 1455.
- 14) Mehra MR, Desai SS, Ruschitzka F and Patel AN. (2020). Hydroxychloroquine or chloroquine with or without a macrolide for treatment of COVID-19: A multinational registry analysis. *Lancet*, 395: 1180- 1186.
- 15) Nampoory MR, Nessim J, Gupta RK and Johny KV. (1992). Drug interaction of chloroquine with ciclosporin. *Nephron*, 62:108 - 119.
- 16) Nguyen A, Guo J and Banyard DA. (2016). Stromal vascular fraction: A regenerative reality? Part 1: Current concepts and review of the literature. *Journal of Plastic Reconstruction and Aesthetic Surgery*, 69:170- 179.
- 17) Richardson P, Griffin I and Tucker C. (2020). Baricitinib as potential treatment for 2019-nCoV acute respiratory disease. *Lancet*, 395: e30 - e31.
- 18) Taylor M, Jefferies J and Byrne B. (2019). Cardiac and skeletal muscle effects in the randomized HOPE-Duchenne trial. *Neurology*, 92: e866-e878.

- 19) Vincent MJ, Bergeron E and Benjannet S. (2005). Chloroquine is a potent inhibitor of SARS coronavirus infection and spread. *Virology Journal*, 2: 69 - 75.
- 20) Wang M, Cao R and Zhang L. (2019). Remdesivir and chloroquine effectively inhibit the recently emerged novel

- coronavirus (2019-nCoV) *in vitro*. *Cell Research*, 30: 269 - 271.
- 21) Xue J, Moyer A, Peng B, Wu J, Hannafon BN and Ding WQ. (2014). Chloroquine is a zinc ionophore. *PLoS One*, 9: e109180.

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