

# Covid-19 :The camouflage of a serial killer

**Satyabrata Kundu (M.Pharm) [ISF College of Pharmacy, Punjab]**

Coronaviruses possess a distinctive morphology, the name being derived from the outer fringe, or “corona” of embedded envelope protein. Members of the family *Coronaviridae*. 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.

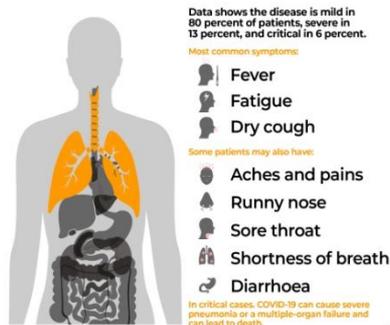
## History

Coronavirus disease was first described in 1931, with the first coronavirus (HCoV-229E) isolated from humans in 1965. Until the outbreak of severe acute respiratory syndrome in late 2002, only two human coronaviruses (HCoV) were known – HCoV-229E and HCoV-OC43. Once the SARS coronavirus (SARS-CoV) had been identified, two further human coronaviruses were identified.

## Epidemiology



## Symptoms



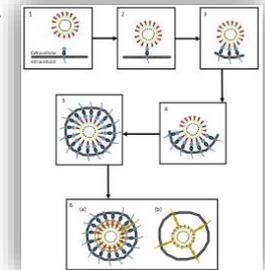
## Drugs

Currently, there is no specific vaccine or medicines for Covid-19. Treatments are under investigation.

Organisation	Type	Name	Phase
Gilead	Treatment	Remdesivir	III
Gsk	vaccine	Covid-19 vaccine	Preclinical
Sanofi	Treatment+vaccine	Plaqueinil	Preclinical
pfiizer	Treatment+vaccine	New mRNA vaccine	Preclinical
vaccitech	Vaccine	Lopinavir & ritonavir combination	Iib

## Mechanism

- The S1 subunit (red) at the distal end of a glycoprotein spike of the virus binds to a membrane-bound molecule of ACE-2 (blue).
- 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), the process continues until the endosome is complete.



- The virus can enter the cell in two ways:
  - 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.
  - 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.

## Helplines

MoHFW: +91-11-23978046; Toll free:1075; E-mail: ncov2019@gmail.com  
Punjab: 104

## Research organisations

WHO; Oxford University; ICMR; CDRI

## References

\*Belouzard S, Millet JK, Licitra BN, Whittaker GR. Mechanisms of coronavirus cell entry mediated by the viral spike protein. *Viruses* 2012;4:1011-33.

\*Google images