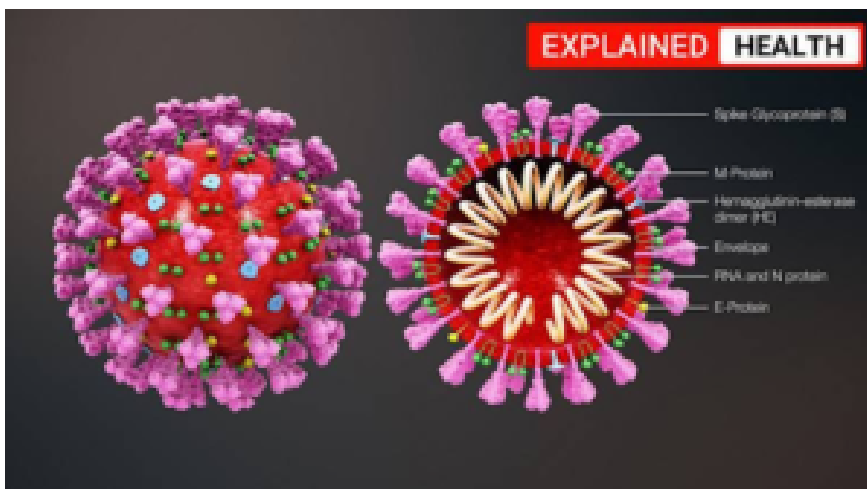


Spike protein of SARS-CoV-2

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- The spike protein of He further stated that if the protein is not stable, antibodies may be induced but they will be less effective in terms of blocking the virus. – the ‘corona’ in the coronavirus that causes Covid-19 disease – has just revealed new secrets.

What is a spike protein?



- The SARS-CoV-2 is a spherical shell featuring spike protein which appears like a crown.
- This protein initiates the process of infection in a human cell by attaching itself to the ACE2 receptor, before replicating.

What does the new research say?

- Dr Bing Chen along with his colleagues at the Boston Children’s Hospital carried out research using the cryogenic electron microscopy (cryo-EM) technique on the strain of the virus.
- They freeze-framed the spike protein before and after its fusion with the cell. After binding with the ACE2 receptor, the spike protein changes its shape to the rigid hairpin.

- The researchers also concluded that the spike can also become visible before the fusion, even without the virus getting attached to the cell.
- The researchers are of the view that the alternative shape of the protein protects the SARS-CoV-2 from breaking down.
- Virus remains viable on various surfaces for a variable time, this can be due to the rigid shape of the spike protein.
- Another conclusion that can be drawn is that the postfusion shape protects the protein from our immune system.
- This is because the post-fusion shape may induce antibodies that do not neutralize the virus.

How is the latest research helpful?

- The latest research on the shape of the spike protein may help the development of the vaccines for the novel virus faster.
- Many vaccines are underway and use the spike protein to stimulate the immune system.
- Dr Chen believes that there's a need for stabilising the spike protein in its prefusion structure to block the changes that lead to its postfusion shape.

Is there any similarity between the pre and post-fusion forms?

- Yes, there's a similarity between the pre and post-fusion forms as the sugar molecules in both of them are evenly located on the surface and are known as Glycans.
- It is because of glycans, the virus ditches the immune system.

SARS-CoV-2

A new strain of the coronavirus emerged in the United Kingdom and has spread to other countries including India.

- According to some sources, this variant could be about 70% more transmissible than the original strain.
- India reported positive cases of the new strain around the end of December 2020.
- More than fifty countries, including India, have imposed travel restrictions to and from the UK.
- The new strain is called SARS-CoV-2 VUI 202012/01 or “B.1.1.7.”
- It was first discovered in September in the southeast of England.
- This strain emerged independently and is not related to another new strain that emerged in South Africa in mid-December.
- The new strain includes a genetic mutation in the “spike” protein that the SARS-CoV-2 coronavirus uses to infect human cells.
- There are concerns that although there may not be much change in the symptoms and the mortality rates remain the same, if the virus spreads more efficiently it may lead to increased hospitalisations, that strain the health systems.
- But experts say that there is a high probability that the vaccines being prepared for the virus would work for the new strain as well.
- As on 11 January 2021, there were 96 cases of the new UK mutant strain in India.