

COVID vaccines under test

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(Source: The Hindu)

In news: According to the “DRAFT landscape of COVID-19 candidate vaccines” released by the WHO, two vaccines are currently being tested on humans.

1) Non-replicating viral vector vaccine:

- It is **developed by CanSino Biological Inc.** along with the Beijing Institute of Biotechnology.
- A non-replicating vector vaccine can be developed either using a virus that is killed or a part of the virus.
- Since it is not a complete virus, it cannot replicate inside the host.
- However, the antigens trigger our immune system to produce antibodies, which help fight the disease in case we contract it in the future.
- Men and women between the ages of 18 and 60 are recruited and tests are being conducted on three groups of 36 participants each.
- Three dosages are being tested – low, medium and high.

2) Messenger RNA vaccine:

- It is developed by Moderna and National Institute of Allergy and Infectious Diseases.
- In RNA vaccines, the messenger RNA from the pathogen is used.
- The messenger RNA gets translated into antigenic protein recognised by our immune cells and antibodies are produced.
- But mRNA is a highly unstable molecule making it difficult to handle.
- So the mRNA is encapsulated in a small ball of fat or lipid nanoparticle (LNP) which acts as a delivery

vehicle that helps the mRNA cross the host cell membrane and once inside the mRNA is released.

- Forty-five subjects in between 18 to 55 years of age of both sexes will be enrolled and divided into three groups and each will receive an intramuscular injection on days 1 and 29.

Along with the above two vaccines the list includes one vaccine developed by Inovio Pharmaceuticals and two from Shenzhen Geno-Immune Medical Institute.

Vaccines from India:

- The WHO draft contains 60 candidate vaccines that are in preclinical trials.
- The DNA plasmid vaccine developed by Gujarat based Zydus Cadila and Live Attenuated Virus vaccines developed by the Serum Institute of India are in the list.
- DNA vaccines are made by taking genes from the pathogen and inserting it into the host's body with a vector.
- The host cells produce the protein of the viral gene and this is recognised as a foreign antigenic protein by the host's immune system.
- DNA vaccines are comparatively easy to make, transport, store and are cheaper.
- Live attenuated virus vaccine is created by reducing the virulence of a pathogen or weakening it, but still keeping it alive.