

4. DNA Vaccine

Why in News?

- Researchers at India's National Centre for Biological Sciences, in collaboration with nine other institutions in India, Africa, and the US, have recently developed India's first and only DNA vaccine candidate for dengue fever.

Highlights

- A DNA vaccine is a type of vaccine that uses a small piece of DNA that codes for a specific antigen (a molecule that triggers an immune response) from a pathogen, such as a virus or bacterium, to stimulate an immune response.
- The DNA is injected directly into the body's cells, where it instructs the cells to produce the antigen.
- The immune system then recognizes the antigen as foreign and mounts an immune response against it, which helps to develop immunity to the pathogen.
- DNA vaccines are third-generation vaccines.
- The ZyCoV-D is the world's first and India's indigenously developed DNA based vaccine for COVID-19.
- Dengue is a mosquito-borne tropical disease caused by the dengue virus (Genus Flavivirus), transmitted by several species of mosquito within the genus Aedes, principally Aedes aegypti.
- This mosquito also transmits chikungunya and Zika infection
- There are 4 distinct, but closely related, serotypes (separate groups within a species of microorganisms that all share a similar characteristic) of the virus that cause dengue (DEN-1, DEN-2, DEN-3 and DEN-4).
- Sudden high fever, severe headaches, pain behind the eyes, severe bone, joint, and muscle pain, etc.
- The dengue vaccine CYD-TDV or Dengvaxia was approved by the US Food & Drug Administration in 2019, the first dengue vaccine to get the regulatory nod in the US.
- Dengvaxia is basically a live, attenuated dengue virus which has to be administered in people of ages 9 to 16 who have laboratory-confirmed previous dengue infection and who live in endemic areas.