New ‘double mutant’ COVID-19

March 25, 2021

In News: A new double mutant strain of SARS CoV2 virus has been detected in India, the Union Health Ministry said recently. This is in addition to other UK, South African and Brazilian variants of the virus already circulating in 18 states of the country.

What is a “double mutant” variant?

- Like all viruses, the coronavirus keeps changing in small ways as it passes from one person to another.The vast majority of these mutations are inconsequential and don’t alter the way the virus behaves.
- But some mutations trigger changes in the spike protein that the virus uses to latch on to and enter human cells — these variants could potentially be more infectious, cause more severe disease or evade vaccines.
- Vaccines against respiratory pathogens like SARS-Cov2, the virus that causes Covid-19, protect us by stimulating our bodies to make antibodies.
- The best type to protect us are the “neutralising antibodies” because they block the virus from being able to enter the human cells.
- Such [double] mutations confer immune escape and increased infectivity,
- If enough mutations happen in a viral family tree or a lineage, the virus can begin to function differently and the lineage can become a so-called ‘variant of concern.
- Double mutant is not a scientific term. It is just another mutant which seems to be unique to India

Receptor-Binding Domain (RBD) Mutations in Coronavirus Variants:

- Three key RBD mutations K417N/T, E484K, and N501Y are found in variants that emerged in South Africa and

Brazil. The UK variant has the N501Y, P681H mutation.

- Viruses with mutations within the RBD of the Spike protein have the most potential to evade antibodies that develop as a result of natural infection or vaccination.
- The RBD binds the cellular receptor allowing the virus to infect cells, and anti-RBD antibodies neutralise the virus.

What is Mutation ?

- Is an alteration in the genetic material (the genome) of a cell of a living organism or of a virus that is more or less permanent
- Can be transmitted to the cell's or the virus's descendants.
- The genomes of organisms composed of Deoxyribonucleic Acid (DNA) and Viral genomes can be of DNA or Ribo Nucleic Acid (RNA).

Why is RNA Mutation more Dangerous than DNA Mutation ?

- When cells multiply, the DNA within them replicates as well, to make copies for the new cells. During replication, random errors are introduced into the new DNA.
- While the errors in DNA virus genomes can be corrected by the error-correcting function of cells in which they replicate, there are no enzymes in cells to correct RNA errors.
- Therefore, RNA viruses accumulate more genetic changes (mutations) than DNA viruses.

Additional Link: https://journalsofindia.com/spike-protein-of-sars-cov-2