Gene Editing to Halt Human Flu Pandemic

Recently scientists in Britain have used gene-editing techniques to stop bird flu spreading in chicken cells.

- The technique was successful for the cells grown in a lab. The next step will be to produce chickens with the same genetic change.
  - However, this is a key step towards making genetically-altered chickens that could halt a human flu pandemic.
- Further, the scientists will use the gene editing technology, known as CRISPR, to remove a section of the birds' DNA responsible for producing a protein called ANP32.
  - ANP32 is protein on which all flu viruses depend to infect a host.
  - The lab tests of cells engineered to lack ANP32 showed they resist the flu virus by blocking its entry and halting its replication and spread.

Bird Flu

- Bird Flu (H5N1) is a type of influenza virus that causes a highly infectious, severe respiratory disease in birds called avian influenza.
- Human cases of H5N1 avian influenza occur occasionally, but it is difficult to transmit the infection from person to person.
- When people do become infected, the mortality rate is about 60%.
- There is no evidence that the disease can be spread to people through properly prepared and thoroughly cooked food.
- Candidate vaccines to prevent H5N1 infection have been developed, but they are not ready for widespread use. Seasonal influenza vaccination does not protect against H5N1 infection.
- WHO collaborates with global health partners and agencies, including the World Organisation for Animal Health (OIE), and the Food and Agriculture Organization of the United Nations (FAO-UN), to control and prevent the spread of animal diseases.
- WHO's global laboratory system, the Global Influenza Surveillance and Response System (GISRS), identifies and monitors strains of circulating influenza viruses, and

provides advice to countries on their risk to human health and available treatment or control measures.

Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR)

- Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR) – Cas9 is a new technique for genome editing.
- It is faster, cheaper and more accurate than earlier techniques, and can precisely target a sequence of DNA in germ cells, extract, edit or replace it even in the embryo stage.
- The technique can prevent hereditary diseases such as sickle cell, thalassaemia, HIV, cancer, and Huntington's disease from passing on to children.
- Another popular method is Somatic Cell Gene Therapy (SCGT), which affects only an individual and not his or her future generations.