# **PD1** Therapy for Cancer

For Prelims: PD1 therapy, T-cells, Dostralimab

For Mains: Significance of PD1 Therapy for treatment of cancer

## Why in News?

In a medical trial in the USA, 12 patients were **completely cured of rectal** <u>cancer</u> **without requiring any surgery or chemotherapy.** 

- The trial used a <u>monoclonal antibody</u> **dostarlimab** every three weeks for six months for the treatment of a particular kind of **stage two or three rectal cancer.**
- The study was done by doctors from the Memorial Sloan Kettering Cancer Centre in New York.

# What are Findings of the trial?

- The trial showed that immunotherapy alone without any chemotherapy, radiotherapy, or surgery that have been staples of cancer treatment could completely cure the patients with a particular kind of rectal cancer called 'mismatch repair deficient' cancer.
  - 'Mismatch repair deficient' cancer is most common among colorectal, gastrointestinal, and endometrial cancers. Patients suffering from this condition lack the genes to correct typos in the DNA that occur naturally while cells make copies.
  - Immunotherapy is a treatment that uses a person's own immune system to fight cancer. Immunotherapy can boost or change how the immune system works so it can find and attack cancer cells.
- Immunotherapy belongs to a category called PD1 blockades that are now recommended for the treatment of such cancers rather than chemotherapy or radiotherapy.

# What is PD1 Therapy?

- PD1 is a type of protein that regulates certain functions of the immune system, including by suppressing T cell activity, and PD1 blockade therapy looks to release the <u>T cells</u> from this suppression.
  - T-cells are the White Blood cells (WBCs). They are critical for developing immunity towards common pathogens or antigens.
- Earlier, this therapy was used post-surgery, but the study has shown that surgery may not be required.
- Although the therapy is usually used for cancers that have metastasised (spread to locations other than where the cancer formed), it is now recommended for all mismatch repair deficient cancers as they result in quicker improvement and lesser toxicity as compared to traditional chemo and radiotherapy.
- Eliminating other treatments can improve a patient's quality of life by preserving fertility, sexual health, and bladder and bowel functions.

## When can such a treatment be accessible in India?

- The problem with immunotherapies is that they are **expensive and unaffordable** for most people in India. An immunotherapy treatment can cost around Rs 4 lakh per month, with patients needing the treatment for six months to a year."People may end up using their life-savings for the treatment.
- Precision medicine, such as using particular immunotherapy drugs for particular types of cancers, is still at a nascent stage in India.
  - Precision medicine is an emerging approach for disease treatment and prevention that takes into account individual variability in genes, environment, and lifestyle for each person." This approach will allow doctors and researchers to predict more accurately which treatment and prevention strategies for a particular disease will work in which groups of people.

## **UPSC Civil Services Examination, Previous Year Questions**

### Q. The term 'ACE2' is talked about in the context of (2021)

- (a) Genes introduced in the genetically modified plants
- (b) Development of India's own satellite navigation system
- (c) Radio collars for wildlife tracking
- (d) Spread of viral diseases

### Ans: (d)

### Exp:

- 'ACE2' is a proteinaceous enzyme on the surface of many cell types that stands for Angiotensin Convertase Enzyme-2. It is an enzyme that generates small proteins by cutting up the larger protein angiotensinogen that then goes on to regulate functions in the cell.
- Using the spike-like protein on its surface, the SARSCoV-2 virus binds to ACE2 like a key being
  inserted into a lock prior to entry and infection of cells.Hence, ACE2 acts as a cellular doorway or
  a receptor for the virus that causes COVID-19.
- Therefore, option (d) is the correct answer.

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