Why in News

Recently, two United States-based scientists, David Julius and Ardem Patapoutian, have been awarded the 2021 Nobel Prize for Physiology/Medicine for their discoveries of receptors for temperature and touch.

They have focused their work on the field of somatosensation, that is the ability of specialised organs such as eyes, ears and skin to see, hear and feel.
Key Points
About the Discoveries:

○ David Julius:
  - He discovered **TRPV1**, a heat-sensing receptor.
  - His findings on the skin’s sense of temperature was based on how certain cells react to capsaicin, the molecule that makes chili peppers spicy, by simulating a false sensation of heat.

○ Ardem Patapoutian:
  - He discovered two mechanosensitive ion channels known as the **Piezo channels**.
    The **Piezo1** is named after the Greek word for pressure, ‘piesi’.
  - He is credited for finding the cellular mechanism and the underlying gene that translates a mechanical force on our skin into an electric nerve signal.

Significance of Discoveries:

○ The findings have allowed us to understand how heat, cold and mechanical force can initiate the nerve impulses that allow us to perceive and adapt to the world around us.

○ This knowledge is being used to develop treatments for a wide range of disease conditions, including chronic pain.

**Note**

- **Somatosensation** is a collective term for the sensations of touch, temperature, body position, and pain recognized through neural receptors in the skin and certain internal organs.
  - It includes processes such as” mechanoreception, thermoreception, proprioception.
- **Mechanosensitive channels** are fascinating proteins, being able to serve both as sensors and effectors.
  - Embedded in membranes, they convert mechanical stimuli such as in-plane membrane tension and curvature into electrical or biochemical signals, leading to regulation of a wide repertoire of cellular processes allowing adaptive response.

**About Nobel Prizes**

- The will of the Swedish scientist Alfred Nobel established the five Nobel prizes in 1895.
- The Nobel Prizes are a set of recognition given to fields of Chemistry, Literature, Peace, Physics, and Physiology or Medicine by The Nobel Foundation.
  - The Nobel Foundation is a private institution established in 1900, has ultimate responsibility for fulfilling the intentions in Alfred Nobel’s will.
- The prizes in Chemistry, Literature, Peace, Physics, and Physiology or Medicine were first awarded in 1901.
• In 1968, **Sveriges Riksbank** established the Sveriges Riksbank Prize in **Economic Sciences** in Memory of Alfred Nobel.

*Source: DTE*