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## Nobel Prize for Physiology/Medicine, 2021

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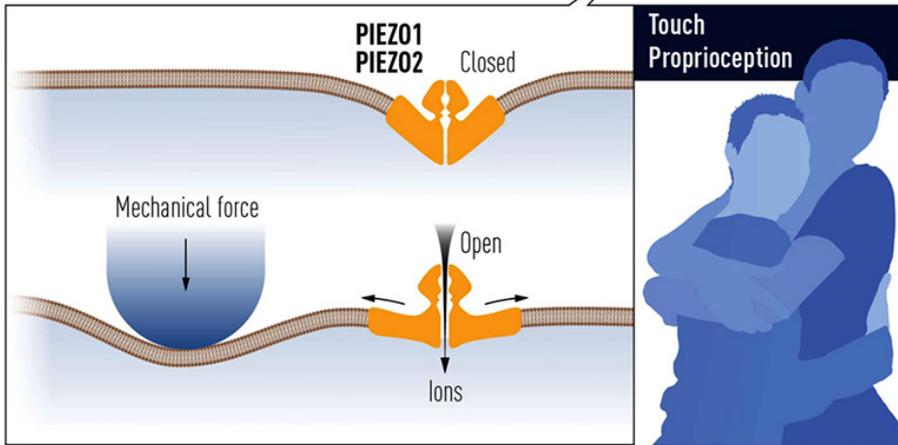
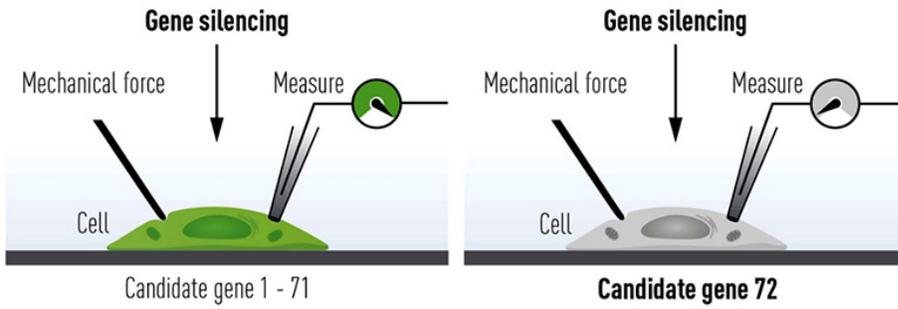
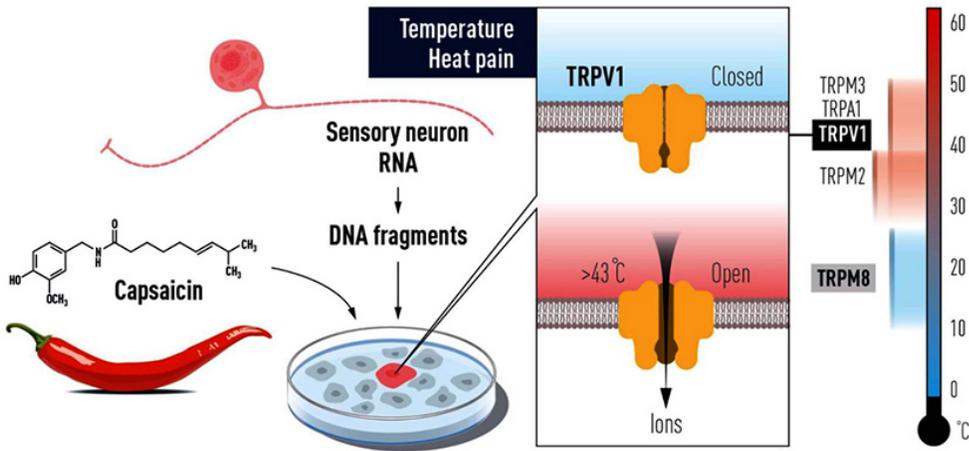
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### Why in News

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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

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- **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**, 'πίεσι'.
    - 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

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- 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**