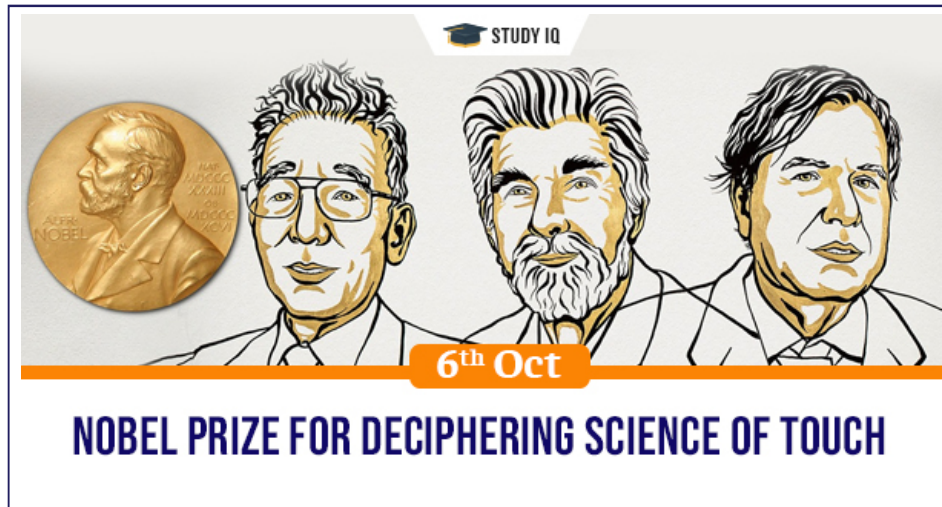


## NOBEL PRIZE FOR DECIPHERING SCIENCE OF TOUCH



### Issue

David Julius and Ardem Patapoutian were declared the joint-winners of the 2021 Nobel Prize in Physiology.

### Background

Understanding the sense of touch has always been difficult for scientists. Other senses such as vision, smell, sound and taste have been fairly well-understood.

### Details

- Their work was based on touch detectors in our body and the mechanism that they employ to communicate with the nervous system.
- Researchers were able to identify receptor called TRPM8 that is activated by cold. Another receptor called TRPV1 activated by heat was also identified.
- The researchers identified molecular sensors in the human body that give us the sensitiveness to heat, and to mechanical pressure including hot, cold and sharpness.

### Sensor molecules

- All molecules in our body do not have the ability to sense heat when they are exposed to it. Only specific proteins have the job to send signal to the nervous system.
- Scientists were aware about such molecules that perform the functions but were unable to discover them until Julius discovered the first heat receptor.

- Since the early discovery, many other molecules were discovered for heat. Later cold sensitive molecules were also discovered.

### Working of sensors

- When the sensors identify any hot or cold object, it sends some specific chemicals, like calcium ions, through the membrane of nerve cells.
- The passage of the chemical causes a small change in electrical voltage, which is picked up by the nervous system.
- If the heat or cold is higher, more channels open up to allow the flow of ions, and the brain is able to know higher amount of heat or cold.

### Other functions

- The heat receptors are able to sense internal temperature changes also. When body temperature increases, it sends signal to the brain to go back to core temperature.
- The pressure sensors can also grasp increase in bladder pressure that allows it to send signal to brain to relieve.

### Therapeutic applications

Identifying sensors that feel pain help us in regulating its function. It will ensure that humans do not feel pain.

#### NOTES

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