

# Weekly Current Affairs

October 5, 2026 – October 9, 2026

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## Nobel Prize in Physiology or Medicine 2026 Awarded for Breakthroughs in Optogenetics

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The **2026 Nobel Prize in Physiology or Medicine** has been awarded jointly to **Karl Deisseroth, Peter Hegemann and Georg Nagel** for their pioneering discoveries concerning **light-gated ion channels and optogenetics**. The Nobel Assembly at Karolinska Institutet announced the award on **5 October 2026**.

The three scientists' work has fundamentally transformed neuroscience by enabling researchers to **control the activity of specific nerve cells using light**. This has provided unprecedented insights into how the brain controls **memory, emotions, behaviour and bodily functions**.

### What is Optogenetics?

**Optogenetics** is a technique that combines **genetics and optics** to control specific neurons using light.

The breakthrough began with studies of the single-celled green alga ***Chlamydomonas***, which can respond to light. **Peter Hegemann and Georg Nagel** discovered light-sensitive proteins called **channelrhodopsins**. These proteins function as **light-gated ion channels**—when exposed to light, they open and allow charged ions to flow across the cell membrane, generating an electrical signal.

**Karl Deisseroth** subsequently introduced the gene for channelrhodopsin into nerve cells. By exposing these genetically modified neurons to blue light, researchers could precisely activate them. His group later demonstrated that the technique could control specific nerve cells in the brains of living mice.

### Why is the Discovery Important?

Before optogenetics, scientists could observe brain activity but had limited ability to establish whether particular neurons **caused** a specific behaviour or response.

Optogenetics changed this by allowing researchers to activate or inhibit selected neurons with exceptional **spatial and temporal precision**. It has therefore helped scientists investigate the neural circuits responsible for:

- Memory and learning
- Emotions and fear
- Movement
- Sleep and wakefulness
- Pain
- Appetite and reward
- Social behaviour
- Addiction

The technique has become an important tool for understanding neurological and psychiatric disorders, including **Alzheimer's disease, Parkinson's disease, epilepsy, schizophrenia and addiction**.

### Potential Medical Applications

Although optogenetics is primarily a research technique, it is also being explored for therapeutic applications.

One promising area is **vision restoration**. Researchers are investigating whether light-sensitive proteins can be introduced into retinal cells to restore some visual function in people suffering from diseases such as **retinitis pigmentosa**. The technology is also being explored for improving the precision of **cochlear implants**. However, many of these applications remain under development and should not yet be considered established treatments.

Key Takeaways

| Aspect    | Details                                      |
|-----------|----------------------------------------------|
| Award     | Nobel Prize in Physiology or Medicine 2026   |
| Laureates | Karl Deisseroth, Peter Hegemann, Georg Nagel |

Asian Games 2026 Wrap-up: India Finishes Fourth with 85 Medals

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India concluded its campaign at the **2026 Asian Games in Aichi-Nagoya, Japan**, finishing **fourth in the overall medal tally with 85 medals**. India’s final haul comprised **21 gold, 27 silver and 37 bronze medals**.

The 2026 edition was marked by a strong late surge from the Indian contingent, with notable performances across **athletics, shooting, archery, boxing, wrestling and team sports**.

India’s Medal Tally

| Medal    | Number |
|----------|--------|
| 🥇 Gold   | 21     |
| 🥈 Silver | 27     |
| 🥉 Bronze | 37     |
| Total    | 85     |

Overall Rank 4th

India finished behind **China, Japan and South Korea** in the overall standings. China’s 169 gold medals and 341 total medals placed it at the top of the table.

India’s Strong Performance in Team Sports

One of the biggest highlights of India’s campaign was the **gold-medal sweep in cricket, kabaddi and hockey**.

Cricket

India retained both Asian Games cricket titles. The **women’s team defeated Sri Lanka**, while the **men’s team defeated Pakistan by 19 runs** in the final to retain the men’s gold medal.

Kabaddi

India won gold in **both men’s and women’s kabaddi**. The women’s team defeated Iran 37–34, while the men’s team came from behind to defeat Iran 40–34.

## Hockey

India achieved a historic double in hockey.

- The **Indian women's hockey team won gold**, ending a 44-year wait for an Asian Games medal.
- The **men's hockey team defeated Malaysia 5-1** to retain its title.
- Both teams secured qualification for the **Los Angeles 2028 Olympic Games**.

## Major Individual and Sport-wise Achievements

**Athletics** was India's biggest contributor in terms of total medals, with **24 medals**, while **shooting** contributed 15 and **archery** 9.

### Archery

India won **nine medals in archery**, including **five golds**. Kumkum Anil Mohod created history by becoming the first Indian woman to win an individual recurve gold at the Asian Games. India's women's recurve team also ended South Korea's long-standing dominance in the event.

### Shooting

Shooting produced **15 medals—3 gold, 8 silver and 4 bronze**. Shooter **Neeru Dhanda** was among India's standout performers, winning two gold medals and a silver. She also carried the Indian flag at the closing ceremony.

### Boxing

India secured **six boxing medals**, including three golds. **Lovlina Borgohain** became only the second Indian woman to win an Asian Games boxing gold after Mary Kom.

### Wrestling

Indian wrestlers won **six medals—2 gold, 2 silver and 2 bronze**. **Aman Sehrawat** and **Sujeet Kalkal** won gold medals in their respective categories.

### Golf

**Pranavi Urs** created history by becoming the **first Indian woman to win an individual Asian Games gold medal in golf**.

## India's Performance Compared with Hangzhou 2022

India's **85-medal haul** was below its record performance of **106 medals at the Hangzhou Asian Games**, where India won 28 gold, 38 silver and 40 bronze medals.

Nevertheless, the Aichi-Nagoya campaign remained significant because of its **historic firsts, Olympic qualification achievements and strong performances by emerging athletes**.

## Why is the Asian Games 2026 Important for India?

The performance highlights India's growing depth across traditional and emerging sporting disciplines. The medal-winning performances in archery, shooting, boxing, wrestling and athletics demonstrate the country's expanding competitive base

beyond a few traditional sports.

The success of both men's and women's teams in cricket, kabaddi and hockey also underlines India's continued strength in team sports.

## Key Takeaways for UPSC

- **2026 Asian Games:** Aichi-Nagoya, Japan.
- **India's rank:** 4th.
- **Total medals:** 85.
- **Gold:** 21; **Silver:** 27; **Bronze:** 37.
- **Top three:** China, Japan and South Korea.
- **China:** 169 gold and 341 total medals.
- **India's strongest sport by total medals:** Athletics – 24.
- **Shooting:** 15 medals.
- **Archery:** 9 medals, including 5 gold.
- India achieved a **gold-medal sweep in cricket, kabaddi and hockey**.
- India's men's and women's hockey teams both won gold and secured **Los Angeles 2028 Olympic qualification**.
- **Pranavi Urs** became the first Indian woman to win an individual Asian Games golf gold.
- **Kumkum Anil Mohod** became the first Indian woman to win an individual recurve gold at the Asian Games.
- India finished with its **second-highest overall Asian Games medal tally**, behind the 106 medals won at Hangzhou.

**Sources:** News On AIR, Olympics.com, NDTV and Indian Express.