

Cancer Patients in UK to Receive Immunotherapy Drugs via Single Injection for Faster Treatment

The UK has introduced a faster method of administering **Nivolumab (an immunotherapy drug)** via a 15-minute injection, replacing the traditional hour-long IV (intravenous) drip for quicker treatment of cancers.

About immunotherapy

- **Definition:** Immunotherapy is a type of **biological therapy** that utilizes components of a **person's immune system** to fight diseases like cancer.
 - ⊕ **Biological Therapy:** This treatment uses **substances derived from living organisms** to target and treat cancer.
 - ⊕ **Chemotherapy:** In contrast, chemotherapy **directly targets cancer cells** to stop their growth and spread, but it may also damage healthy cells.
- **How Immunotherapy Works?**
 - ⊕ **Stimulating immune system:** So that it can work harder or smarter in recognizing and attacking cancer cells. **E.g.,** Immunomodulators.
 - ⊕ **Creating immune system components in a lab:** So as to restore or improve the immune system's ability to find and destroy cancer cells. **E.g.,** Monoclonal Antibodies.


Advantages of immunotherapy


- **Precise:** The immune system can target cancer cells while sparing healthy cells.
- **Dynamic:** It adapts and re-evaluates to launch new attacks if a tumor evades detection.
- **Remembers:** The immune system's memory allows it to recognize and eliminate recurring cancer.


Disadvantages of immunotherapy


- **Less effective** for "immune suppression" and "immune exclusion" tumours due to high selectivity.
- **Its effectiveness varies**, making patient survival rates and prognosis uncertain.
- **Treatment costs are high.**


Types of Immunotherapies


Checkpoint Inhibitors
Release immune system "brakes" to help it target cancer cells.


Monoclonal Antibodies
Man-made immune proteins designed to target specific cancer cell parts.


Cytokines
(small proteins that carry messages between cells)
Use small proteins to stimulate immune cells to attack cancer.


Oncolytic Viruses
Modified viruses that infect and kill tumor cells.


Immunomodulators
Enhance parts of the immune system to treat certain cancers.


Others
Includes CAR T-cell therapy and cancer vaccines.

Prime Minister inaugurated Vizhinjam International Deepwater Multipurpose Seaport in Kerala

Vizhinjam Port, worth Rs 8,800 crore, is **India's first dedicated container transshipment port**.

- **A transshipment port** includes terminals, where cargo containers are shifted from one vessel to another before they reach their final destination.
- India is also developing a **deepwater port at Vadhvan** in Maharashtra's Palghar district and another mega transshipment port is proposed on **Great Nicobar Island** in the Andaman and Nicobar Islands.

Vizhinjam Port

- Vizhinjam port has been developed in **Landlord Model** with a **Public Private Partnership (PPP)** component on a Design, Build, Finance, Operate and Transfer ("DBFOT") basis.
 - ⊕ Under the landlord model, **port authority retains ownership and control** of port but actual cargo handling and terminal operations are typically leased to private operators.
- This is the **first Greenfield port project** in India, **initiated by a state Government** under PPP mode.
- **Significance:**
 - ⊕ **Strategic Location:** Close to the International **East-West shipping route connecting Europe, the Persian Gulf and the Far East**.
 - ⊕ **Deep Draft:** Natural deep draft of nearly 20 meters requiring no capital dredging.
 - ⊕ **Curvilinear Coast:** Mitigating tsunami impact, minimising maintenance costs.

Need for Transshipment Hub

- **Foreign Dependence:** Currently, nearly **75% of India's Transshipment cargo** is handled at ports **outside India**, especially at Colombo, Singapore and Klang.
- **Revenue:** Expected to reduce \$80–\$100 per container cost and \$200–220 million annual potential income loss.
- **Maritime Infrastructure:** It aligns with **PM Gati Shakti National Logistics Policy** and **Maritime Amrit Kaal Vision 2047**.

Heavy rainfall and strong winds witnessed across Delhi region due to Western Disturbance

According to the **India Meteorological Department (IMD)**, the weather conditions were triggered by a fresh **Western Disturbance** over northern and northwestern India.

- There has been an **increase in the frequency of Western Disturbances** which is directly linked to climate change.

Western Disturbances (WD)

- Western Disturbances are **extratropical storms** that are a result of **low-pressure areas formed due to the interactions between polar and tropical winds**.
 - ⊕ These are **embedded within the subtropical westerly jet stream** — a high-altitude, fast-moving air current that flows from west to east in the Earth's atmosphere — that lies over the Himalayan and Tibetan highlands.
- WD originate in the **Caspian Sea or the Mediterranean region** and bring **sudden winter rain** to **Hindu Kush, Karakoram, and Western Himalaya region**.
- **Characteristics:**
 - ⊕ It is a **non-monsoonal precipitation pattern** which is driven by the **westerlies**.
 - ⊕ Most common during the **boreal winter (December to March)**.
 - ⊕ Results in cold waves, fog, avalanches, landslides, lightning and heavy precipitation.
 - ◆ **E.g. Uttarakhand Floods in June 2013.**
 - ⊕ **Significance:** Winter precipitation crucial for water security and agriculture, particularly for the **Rabi crops**.



Climate Change and Western Disturbances

- **Increase in WD Frequency** due to rising global temperatures and subsequent strengthening of subtropical westerly jet stream.
- **Impacts on weather outside winter season** leading to rise in extreme weather events like heavy rainfall and floods.
- **Increasing moisture in WD** due to rapid **warming of the Arabian Sea**.
- **Increasing expanse of WD** due to broadening of subtropical westerly jet stream.

Prime Minister Inaugurated Projects Worth ₹58,000 Crore in the Capital City Amaravati, Andhra Pradesh (AP)

PM laid the foundation stone for **multiple infrastructure projects** that include the Legislative Assembly, High Court, Secretariat, etc.

- PM also laid the foundation stone of **Navdurga Testing Range**, (to test Missiles) at **Nagayalanka** in AP.

About Amaravati (Capital of Andhra Pradesh)

- **Amaravati is a greenfield city** along the banks of **river Krishna**, located in **Guntur District**.
- **The Capital project began in 2014**, when Telangana was carved out of Andhra Pradesh.

Buddhist Legacy of Amaravati

- **Amaravati Stupa (2nd Century BCE):** Among the oldest Buddhist monuments in India & inscriptional evidence refers to it as the **Maha Chaitya (The Great Stupa)**.
- **Spread of Buddha's Teachings:** Believed to be the place where **Gautam Buddha** first spread his teachings of **"Kalachakra" (Wheel of time)**.
- **Believed to be residing in Amaravati Region, Acharya Nagarjuna** propounded the **Madhyamika philosophy**.
 - ⊕ It is the basis for **Mahayana Buddhism**.
- **Chinese Pilgrims:** **Xuanzang** (c. 602–664), visited Amaravati in the first millennium to collect sacred texts.

Other Historical Legacy of Amaravati ("the place for immortals")

- **Satavahana Capital:** Served as the capital of the **Satavahana Kingdom** from the mid-1st to early 3rd century AD.
- **Sri Amaralingeswara Swamy Temple:** A medieval temple dedicated to **Shiva**.
- **Amaravati** pioneered an independent school of art, on par with **Gandhara and Mathura art styles**.

Features of the Amaravati School of Art

- **Narrative Style:** Depicts stories from the **Buddha's life**.
- **Dynamic Medallions:** Energetic and expressive carvings that animate Buddhist narratives.
- **Naturalism:** Realistic portrayal of scenes, making them visually engaging.
- **Architectural Elements:** Found mainly on railings, plinths, and other parts of Buddhist stupas.
- **Material:** Crafted from a white, marble-like stone that enhances detail and visual appeal.
- **Example:** **Buddha statue** at **Nagarjunakonda** in the Amaravathi style.

Government of Karnataka notified Hesaraghatta Grassland Conservation Reserve

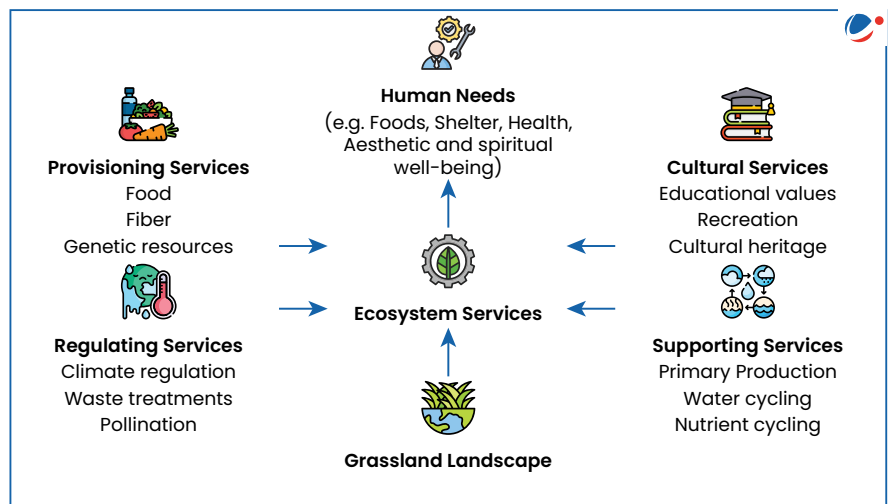
State Government has notified Hesaraghatta Grassland Conservation Reserve under Section 36A of the Wildlife Protection Act (WPA) 1972.

Conservation Reserve

- Conservation Reserve is considered a **protected area under WPA 1972** and can be declared by **State Governments** and **Central Government** for protecting landscapes, seascapes, flora and fauna.
- These **typically act as buffer zones** to or **connectors and migration corridors** between established national parks, wildlife sanctuaries and reserved and protected forests of India
- **Regulation: Conservation Reserve Management Committee**, appointed by the state Government, advises Chief Wildlife Warden.

About Hesaraghatta Grassland

- Located around Hesaraghatta Lake **near Bengaluru** in Karnataka and is the last remaining grassland habitat in Bengaluru region.
 - ⊕ **Grasslands**—or open regions are dominated by grass and characterised by warm, dry climate—are one of the most widely distributed terrestrial biomes globally.
 - ⊕ Grasslands cover 20–40% of global land area and **approximately 24% of India's geographical area**.
 - ⊕ Globally classified into **Tropical Savannas, Temperate grasslands and Steppes**.
- **Significance:**
 - ⊕ Important **reservoir of biodiversity** including leopards, Indian Foxes, Smooth Coated Otters and migratory birds etc.
 - ⊕ Acts as **catchment area for reviving groundwater levels** and sponge to soak up monsoon runoff.
 - ⊕ **Large catchment of the Arkavathy River**, Thippagondanahalli reservoir and Hesaraghatta lake.



Also In News

Mitochondrial DNA (mtDNA)

Scientists discovered a small molecule, PZL-A, that targets a key mitochondrial enzyme, offering potential treatment for rare inherited disorders caused by **mtDNA mutations**.

About Mitochondrial DNA (mtDNA)

- **Location:** Mitochondrial DNA (mtDNA) is a circular chromosome located inside mitochondria, the energy-producing organelles in cells.
- **Unique Features of mtDNA**
 - ⊕ **Own DNA:** Mitochondria are the only organelles with their own genetic material, separate from nuclear DNA.
 - ⊕ **Maternal Inheritance:** mtDNA is inherited **exclusively from the mother**, and not from the father.
- **Mitochondrial Disease Treatment:** Mitochondrial Replacement Therapy (MRT) is a process that replaces mutated mtDNA with healthy mitochondrial DNA.
 - ⊕ It can be done either before or after in vitro fertilization (IVF).

Bioswales

Bioswales are a powerful **Nature-Based Solution (NbS)** designed to help manage stormwater runoff while boosting biodiversity and enhancing urban landscapes.

About Bioswales:

- **Concept:** They are shallow, vegetated ditches designed to capture and filter runoff.
- **Function:** They help in controlling erosion, reducing pollutants, and promoting groundwater recharge.
- **Design:** Typically filled with native plants, gravel, and sand to aid in water filtration.
- **Benefits:** Improve stormwater management, reduce flooding, and enhance local biodiversity.
- **Location:** Commonly used in urban areas to manage runoff from roads, parking lots, and rooftops.
- **Varieties:** Can vary in size, shape, and depth depending on the area and rainfall patterns.



RBI regulated markets

An RBI Working Group to undertake a comprehensive review of trading and settlement timings of **markets regulated by the Reserve Bank** has submitted its report.

- **RBI**, under the provisions of various legislations including RBI Act 1934, FEMA 2000, Government Securities Act 2006 and Payments and Settlement Systems Act 2007 regulates following markets:
 - ⊕ **Money market**, comprising call money, market repo and TREP segments
 - ⊕ **Government Securities market**, comprising dated securities, T-Bills and State Government Securities.
 - ⊕ **Foreign exchange market**, including spot, forwards and swaps, etc.
 - ⊕ Markets for derivatives on interest rate, foreign exchange and credit



Black Hole Bomb

Researchers have created the first laboratory analog of the "black hole bomb," a concept proposed by physicist Yakov Zel'dovich in 1971.

About Black Hole Bomb

- **Concept:** The idea leverages the powerful rotational energy of a spinning black hole's ergosphere (region just outside the event horizon), where the rotation amplifies nearby particles.
- **Process:** Zel'dovich envisioned a fast-spinning cylinder that, when hit by waves, would make them stronger as they bounced back.
- **The phenomenon, known as the Zel'dovich effect**, occurs when a spinning object moves faster than incoming waves, shifting them similarly to the Doppler effect but due to rotation.



Opinion trading platforms

The Securities and Exchange Board of India (SEBI) has cautioned investors against dealing with opinion trading platform.

About Opinion trading platforms

- **Concept:** These platforms allow participants to earn money by investing in their predictions on any sports, political, weather, or crypto events,
 - ⊕ Participants can bet on any event based on their predictions.
 - ⊕ If the predictions are correct, a participant makes money, and in case the prediction goes wrong they lose.
- **Legal Status:** not regulated by SEBI because the items being traded are not classified as securities under Indian law.
- **Economy:** These platforms have registered transaction volumes of over Rs 50,000 crore a year with a user base of more than 5 crore people.



Ramman Festival

Ramman Festival, inscribed in **UNESCO Representative List of the Intangible Cultural Heritage of Humanity**, is being celebrated in Uttarakhand.

About Ramman Festival

- Celebrated **annually in late April** (after harvest) in the twin villages of Saloor-Dungra in Uttarakhand.
- **Religious Significance:** Held in honour of Bhumiya Devta, the village's tutelary deity.
- **Main Features:** Involves complex rituals, including recitation of a version of epic of Rama and performance of songs and masked dances.
 - ⊕ Another important aspect of these performances is the singing of **Jagar**, a musical rendition of local legends.



Initiatives for Ageing with Dignity

The President of India launched initiatives for senior citizens at the 'Ageing with Dignity - Initiatives for the Welfare of Senior Citizens' event.

Initiatives launched

- **Senior Citizen Welfare Portal:** A digital platform for elderly citizens, providing easy access to government schemes, healthcare benefits, and welfare services.
- **Senior Citizen Homes:** Supported under the Ministry of Social Justice & Empowerment's programme aligned with the Maintenance and Welfare of Parents and Senior Citizens (MWPSA) Act.
- **MoU with Brahma Kumaris:** Focuses on promoting emotional balance, mindfulness, and intergenerational bonding.



Triple Test

Jharkhand collected data on population of Other Backward Classes (OBCs), **first step of "Triple Test"**, laid down by Supreme Court for OBC quotas in local bodies.

About Triple test

- Outlined in **Vikas Kishanrao Gawali vs State of Maharashtra case, 2021**.
- **Three-steps of Triple Test:**
 - ⊕ **Set up a dedicated Commission** to conduct rigorous empirical inquiry into the nature and implications of backwardness in local bodies;
 - ⊕ **Specify the proportion of reservation required** in light of recommendations of the Commission;
 - ⊕ **To ensure reservation for SCs/STs/OBCs taken together does not exceed an aggregate of 50 per cent** of the total seats.

Place in News



Chile (Capital: Santiago)

7.4 magnitude earthquake Hits Southern Chile, Tsunami Alert Issued.

Political Features

- Situated along the **western seaboard of South America**.
- **Boundaries:** Peru and Bolivia (North); Argentina (East)
- Surrounded by **Pacific Ocean** in the West.
- **The Argentina–Chile border** is the **longest international border** of South America and the **third longest in the world** after the **Canada–United States** border and the **Kazakhstan–Russia** border.

Geographical Features:

- Landscape dominated by **Andes mountains**.
- **Atacama Desert** in the North- driest nonpolar desert in the world.
- Extreme natural events **volcanic eruptions, violent earthquakes, and tsunamis**, due to lies in the **Pacific Ring of Fire**.
- **Highest Peak:** Ojos del Salado the highest active volcano in the world.

Economic Significance:

- **Top copper producer** in the world.
- Part of the **"Lithium Triangle"** with Argentina and Bolivia



AHMEDABAD



BENGALURU



BHOPAL



CHANDIGARH



DELHI



GUWAHATI



HYDERABAD



JAIPUR



JODHPUR



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