World's First Personalized Gene Editing Therapy Used to Cure a Rare Disease

Scientists in the US have, for the first time, successfully used a personalized **CRISPR-based gene-editing treatment** to cure a baby suffering from a rare genetic disorder called **CPS1 deficiency.**

- CPS1 deficiency is a rare condition where the liver fails to break down byproducts from protein metabolism, leading to toxic **ammonia buildup** in the body.
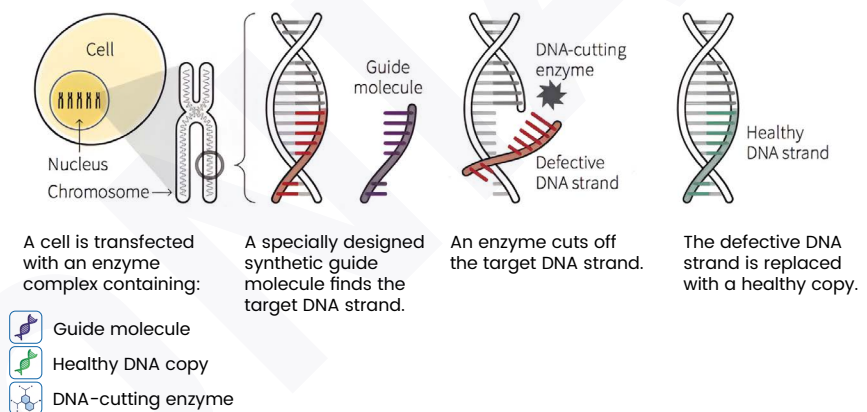
What is Gene Editing Therapy?

- It involves **modifying an organism's DNA** by **correcting genetic defects, altering gene expression, or introducing new genetic material.**
  - It offers hope for treating conditions like **sickle cell anemia, cystic fibrosis,** and **certain cancers,** which are otherwise hard to treat.
- **DNA Modification in Two Ways:**
  - **Somatic Gene Editing:** Involves editing the **DNA of non-reproductive (somatic) cells,** like **skin, liver,** or **blood cells,** affecting specific tissues/organs in a living individual.
    - **Changes are limited to the treated individual** & are not passed on to offspring.
  - **Germline Gene Editing:** Involves editing the **DNA of reproductive cells (sperm, eggs) or early-stage embryos,** affecting all cells in the resulting individual.
    - **Changes are heritable** (passed to future generations) as it **alters the genetic makeup of the entire organism,** including somatic & reproductive cells.
- **Mechanism: (Refer to the diagram)**
- **Tools Used: CRISPR-Cas9** (uses guide RNA & Cas9 nuclease to cut DNA at targeted sites); **Zinc Finger Nucleases (ZFNs); TALENs,** etc.

DNA editing

A DNA editing technique, called CRISPR/Cas9, works like a biological version of a word-processing programme's "find and replace" function.

HOW THE TECHNIQUE WORKS

A cell is transfected with an enzyme complex containing:
- Guide molecule
- Healthy DNA copy
- DNA-cutting enzyme

A specially designed synthetic guide molecule finds the target DNA strand.

An enzyme cuts off the target DNA strand.

The defective DNA strand is replaced with a healthy copy.

A Major Solar Eruption ("Bird-Wing" Event) Is Set To Possibly Impact the Earth

NASA's satellites recently detected a massive solar flare, with superheated plasma erupting from the Sun and spreading out in dramatic "wing-like" shapes.

What are Solar Flares?

- **Definition:** Solar flares are **giant explosions** on the sun that send energy, light and high speed particles into space.
  - They are often associated with solar magnetic storms known as **coronal mass ejections** (CMEs). CMEs are large expulsions of plasma and magnetic fields from the Sun's corona.
- **Classification:** The biggest flares are known as **"X-class flares"** .The smallest ones are **A-class** (near background levels), followed by B, C, M and X.
- **Frequency:** Flares occur more frequently during the **solar maximum** (peak of the **11-year solar cycle)**.
  - During the solar cycle, the **Sun's magnetic poles flip,** reversing polarity approximately every 11 years.
- Solar flares bursts emit radiation across the **electromagnetic spectrum,** including **X-rays, gamma rays, ultraviolet light, visible light, radio waves,** etc.

Implications of Solar Flare Events

- **Geomagnetic Storms:** These flares can disturb Earth's magnetic field, leading to **radio blackouts, power grid failures**, & stunning **auroras.**
- **Satellite Damage:** High-energy particles can **damage satellite electronics,** affect **GPS systems,** & degrade **communication networks.**
- **Human Safety: Do not directly harm** people on Earth because the **magnetic field & atmosphere** shield us. However, astronauts & space missions can be **at risk** due to radiation exposure.

India outlines 'Five-point call for Global Action' to Protect Mountain Ecosystems

It was outlined in the first Sagarmatha Sambaad organised in **Kathmandu (Nepal)** under the theme **'Climate Change, Mountains, and the Future of Humanity'.**

- Sambaad (dialogue) is named after the world's tallest mountain **Sagarmatha** (Mt. Everst).
- India stressed on the need for collaborative efforts to safeguard the **Himalayas and other mountain ecosystems at the sambaad.**

Need to protect the Himalayas: crucial for the livelihood of about **1.3 billion people, provides** forest cover, feeds perennial rivers, conserves biodiversity, etc.

Five-point call for global action to address the shared ecological challenges are:

- **Enhanced Scientific Cooperation:** Research collaboration, monitoring cryospheric changes, hydrological cycles, and biodiversity.
- **Building Climate Resilience:** Investing in early warning systems for disasters like Glacial Lake Outburst Floods (GLOFs), climate-resilient infrastructure in mountain areas.
- **Empowerering Mountain Communities:** Ensuring welfare, needs and aspirations of local communities are at heart of policy-making and their benefit from green livelihoods and sustainable tourism..
- **Providing Green Finance:** Making available climate finance as per UNFCCC and its Paris Agreement for mountain Nations to implement adaptation and mitigation strategies effectively.
- **Recognizing Mountain Perspectives:** Ensuring unique vulnerabilities and contributions of mountain ecosystems are suitably featured in global climate negotiations and sustainable development agendas**.**

Initiatives taken to protect Himalayan mountain ecosystem

- **National Mission on Sustaining Himalayan Ecosystem:** Launched under the National Action Plan on Climate Change (NAPCC).
- **SECURE Himalaya project:** Part of "Global Partnership on Wildlife Conservation and Crime Prevention for Sustainable Development" (Global Wildlife Program).
- **International Centre for Integrated Mountain Development (ICIMOD) :** Intergovernmental knowledge and learning centre working on behalf of the people of the Hindu Kush Himalaya (HKH).

First Overseas Campus of Indian Institute of Foreign Trade (IIFT) to be Set Up in Dubai

This step aligns with the **vision of National Education Policy (NEP) 2020,** which emphasizes the **internationalisation of higher education in India** and the creation of global learning hubs.

- IIFT, a deemed to be university, was **established in 1963 as an autonomous body** under the **Ministry of Commerce & Industry** to contribute in the skill building for the external trade sector of India.

About Internationalization of Higher Education in India

- **NEP, 2020 envisages two ways:**
  - **Indian Higher Education Institutions (HEIs)** set up campuses abroad. **E.g.,** IIT Madras has opened a campus in Tanzania.
  - **Foreign HEIs** set up campuses in India. **E.g.** Deakin University (from Australia) has opened its first campus in GIFT City, Gujarat.

Significance of Internationalization of HEIs for India

- **Quality of Education & Research:** Global collaborations boost **research collaboration, patent applications and academic standards** via faculty exchange and increased funding.
- **Saving and earning foreign exchange:** As in 2022, nearly 1.3 million Indian students were studying in the USA, Canada, Australia, etc.
- **Employability with Future Skills: Cross-cultural skills and global certifications** prepare students for high-demand careers**.**
- **Soft Power:** Showcasing India's heritage enhances cultural influence and diplomacy.

Challenges in Internationalization of HEIs

- **Regulatory Barriers:** Complex approval processes and restrictions on foreign universities hinder partnerships. **E.g.,** as per a recent report of a Parliamentary panel **no top Ivy League Institute** has set up its campus in India yet.
- **Cultural and Language Barriers:** Lack of **diversity training and English proficiency** in some institutions affects global integration.
- **Impact on Indian HEIs: Lucrative salaries by foreign HEIs** could lead to **brain drain** of top faculty from Indian HEIs.

PRS Report Flags Sharp Decline in State Assembly Functioning

Key Findings

- **Declined in Average Number of Sitting Days:** from 28 in 2017 to **20** in **2024**. 11 states met requirement under Article 174 through **short sessions** that lasted for 1 or 2 days.
  - **Article 174** of the Constitution requires state legislatures to meet at least once every 6 months.
  - A **Constitution review committee** recommended **minimum annual sittings of 50 days** for smaller legislatures (less than 70 members) and **90 days for larger** ones.
- **Limited Debate:** States passed an average of 17 Bills in 2024; however **51% of bills were passed within a day of introduction.**
  - Only **4%** of Bills passed in 2024 were referred to a **Committee** for detailed examination.
- **Absence of Speaker & Deputy Speaker (Article 178):** As of April 2025, 8 states/UTs had no Deputy Speaker. **Jharkhand** has **not elected a Deputy Speaker for over 20 years.**
- **Delay in Assent to Bills:** In 2024, 18% of Bills took over 3 months to receive assent. E.g., Himachal Pradesh 72% of Bills delayed.
  - **Article 200 requires** the Governor to assent, return, or reserve Bills without undue delay.

Implications

- **Rushed Lawmaking:** Limited debate leads to weak, unclear, or poorly implemented laws.
- **Democratic Deficit:** Lack of transparency & limited discussion can erode public trust in legislative institutions & democratic processes.
- **Governance Gaps:** Delays or weak laws cause confusion, policy inconsistency, and poor service delivery.

Also In News

Hodeida and al-Salif Ports

Israel launched a strike on **Hodeida and al-Salif ports** in **Yemen,** controlled by Houthis.

About the Ports

- **Location:** Western Yemen on the **coast of Red Sea.**
- **Significance:** Together with Ras Issa, the ports of Hodeidah and Salif handle about **70% of all Yemen's imports and 80% of all humanitarian assistance.**

Rajon ki Baoli

Rajon ki Baoli Restored by Archaeological Survey of India in Collaboration with World Monuments Fund India.

About Rajon ki Baoli

- It is a **four-tiered step-well** built during the **Lodi period** to store water for drinking and cooking purposes.
- **Location:** In **Mehrauli Archaeological Park** (New Delhi).
- **Built by: Daulat Khan, an Amir** of the court of Sikander Lodhi in 1506 AD**.**
- **Architecture Type:** Indo-Islamic.

Polio (Poliomyelitis)

The World Health Organization has declared a polio outbreak in Papua New Guinea.
- Papua New Guinea was declared **polio-free in 2000.**

About Polio
- It is a **highly infectious disease** caused by a **virus.** It invades the nervous system and can cause **total paralysis.**
- **Transmission:** Person-to-person through faecal-oral route, contaminated water or food, and multiplies in the intestine.
- **Initial symptoms:** Fever, fatigue, headache, vomiting, stiffness of the neck and pain in limbs.
- **Polio mainly affects** children under **5 years of age.**
- **There are two vaccines available:** Oral polio vaccine & inactivated polio vaccine.
- India was officially declared polio-free in **2014.**

Twister

Massive weather phenomena called twisters were observed in the US.

What is a twister?
- It is **another name for tornadoes** in the US which are **violently spinning (at 250 Miles/Hr), funnel-shaped columns of air** that stretch from the dark thunderclouds they form all the way to the ground.
- **Formation:** They develop **when moist and warm air collides with dry and cold air, creating atmospheric instability** and strong updrafts within a thunderstorm.
  - The resulting wind shear causes the air to spin, and if this rotation is tilted vertically and intensifies, a tornado (or twister) forms.
- Majority of these are formed around **Gulf of Mexico as it acts as large source of moisture**

PM E-DRIVE

Karnataka Government requested Electric Buses Under PM Electric Drive Revolution in Innovative Vehicle Enhancement (PM E-DRIVE) Scheme.

About PM E-Drive
- **Launch:** 2024
- **Ministry:** Ministry of Heavy Industries.
- **Aim:** Faster adoption of electric vehicles (EVs), setting up of charging infrastructure & development of EV manufacturing ecosystem in India.
- **Duration:** 2 years (2024 to 2026).
- **Components :**
  - **Subsidies:** Demand incentives for e-2W, e-3W, e-ambulances, e-trucks & other new emerging EV categories.
  - **Grants for creation of capital assets:** e-buses, establishment of network of charging stations etc.

Indian Yak

The first-ever chromosome-level genome of the Indian yak was assembled by specialists from four ICAR institutions.

About Indian Yak
- The Indian yak (Bos grunniens), known as the **'ship of the Himalayas',** supports high-altitude communities with meat, milk, and transport.
- **Habitat:** Found across the Himalayan region, Tibetan Plateau, Pamir Mountains, Tajikistan, and up to Mongolia and Siberia.
- **Characteristics**
  - They have **larger lungs and heart** than cattle found at lower altitudes.
  - **Diet:** Herbivorous, feeding mainly on grasses and alpine plants.

Multi Agency Centre (MAC)

A new and revamped MAC with **embedded AI/ML techniques** was inaugurated by the Union Home Minister in New Delhi.

About MAC
- It is a **common counter-terrorism grid** under the **Intelligence Bureau (IB)** that was made **operational in 2001 post-Kargil war.**
- It connects India's **island territories, insurgency areas, and high-altitude terrain,** ensuring even district-level connectivity.
- As many as 28 organisations, including the **Research and Analysis Wing (R&AW), armed forces and State police** are part of the platform who shares **real-time intelligence inputs.**

Forest Clearance

The Supreme Court asks States and UTs to set up Special Investigation Teams (SITs) to examine cases of forest land being misused for non-forestry activities.

Procedure for Forest Clearance (as per Forest (Conservation) Act, 1980):
- **Stage I – In-Principle Approval:** Approval is granted if certain conditions are met like allocating funds for **compensatory afforestation.**
- **Stage II – Final Clearance:** Given after the State confirms compliance with all Stage I conditions.
- **Approval Authority:**
  - For projects up to 5 hectares (except mining), clearance is given by the **Chief Conservator of Forests at the Regional Office.**
  - For projects above 5 hectares, or any mining proposals, clearance is granted by the **Ministry of Environment, Forests and Climate Change** based on the advice of the **Forest Advisory Committee.**

Place in News — Honduras (Capital: Tegucigalpa)

Honduras has opened an embassy in Delhi.

Political Boundaries
- **Location:** Central America
- **Land Borders:** Guatemala and El Salvador (West) and Nicaragua (South and East).
- **Surrounding Water Bodies:** The Caribbean Sea (North), and the Pacific Ocean (South).

Geographical Features
- **Major Rivers:** Patuca & Ulúa
- **Highest Peak:** Mount Las Minas.

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