Russia's mRNA Vaccine "Enteromix" Shows 100% Success in Preclinical Trials

It uses **mRNA technology** to stimulate **immune responses** against **cancer.**

- Initially targeting **colorectal cancer,** it is **fully personalized,** with each dose tailored to a patient's tumor through **mutation profiling.**

About mRNA Vaccines

- mRNA vaccines are a type of vaccine that **use a small piece of messenger RNA** (mRNA) to instruct our cells to **produce a protein specific to a virus.**
  - mRNA **(messenger Ribonucleic Acid)** is a **genetic molecule** that contains instructions or recipe that directs cells to make a protein using its natural machinery.
- mRNA **delivers genetic material,** encapsulated in **lipid nanoparticles,** into body to prompt protein production that match up with parts of pathogen called antigens.
  - E.g., the mRNA vaccine for COVID-19 directed cells to produce copies of a protein on the outside of the coronavirus known as the **spike protein.**
- Immune system sees these **foreign antigens** as invaders, dispatching **defenders called antibodies and T-cells** and training immune system for potential future attacks.

Challenges of mRNA vaccines

- **Storage Requirements:** Require ultra-cold storage, making distribution difficult.
- **Short-term Side Effects:** E.g., fever, fatigue, and soreness at the injection site.
- **Long-term Safety:** mRNA vaccines are relatively new, so long-term effects are still being studied.

Benefits of mRNA Vaccines

Rapid Development
mRNA vaccines can be designed quickly once the virus's genetic sequence is known.

Strong Immune Response
They stimulate both antibody and T-cell immunity for comprehensive protection.

No Live Virus Needed
This reduces the risk of causing disease while maintaining effectiveness.

France to Appoint 5th Prime Minister in Less Than Two Years

Recently, the **French Parliament** voted to **remove the government** along with the **Prime Minister,** creating **political instability in the country.**

Comparison between the Indian and the French Political Systems

- **Similarities: Republican** form of government with elected heads of state, **bicameral legislatures,** based on the principles of **democracy,** emphasizing **liberty, equality, and fraternity.**
- **Differences:** (Refer Table)

Aspect	India	France
Constitutional Model	**Parliamentary republic;** single executive led by PM; President largely ceremonial.	**Semi-presidential** with dual executive (i.e., President + Prime Minister).
Procedures to elect the President	**Indirect election** by an electoral college using **single transferable vote** and **secret ballot.**	**Direct election** by universal adult suffrage.
Choosing / Removing Prime Minister (PM)	The **PM is elected by Lok Sabha** and must retain the **confidence of Lok Sabha.**	The **PM is appointed by the President,** but must keep **Assembly's confidence.**
Federal Design	**Quasi-federal;** Blends federal and unitary features.	**Unitary;** Centralized authority with local governments as central agents.
Approach to Secularism	**Positive approach:** State maintains **neutrality but can intervene** to reform **(e.g.,** abolishing untouchability).	French **laïcité** enforces **strict separation** of religion and state **(e.g.,** bans on conspicuous symbols).

India's space economy is projected to grow fivefold by 2033 - Report

According to a report by **CII and KPMG,** India's space sector is **projected to surge from USD 8.4 billion in 2022 to USD 44 billion by 2033,** fueled by **satellite-enabled services and exports.**

- This expansion is **expected to increase India's share of the global space economy** from approximately 2% to 8% by 2033.

Key Trends According to Report

- **Shifting of Primary Focus in Space Services:** Towards **monetizing downstream services** such as Earth Observation (EO), Satellite Communication, and Navigation.
  - These services are **increasingly integrated across sectors** i.e., telecommunication, agriculture, disaster management, urban planning, infrastructure monitoring, etc.

> **Initiatives Undertaken for Development of Space Economy**
> - **Indian Space Policy 2023:** Enables end-to-end participation of Non-Governmental Entities in all domains of Space activities.
> - **NewSpace India Limited (NSIL):** acts as ISRO's commercial arm, promoting and commercializing its products and services.
> - **Other:** 100 % FDI, 1,000 crore **Venture Capital (VC)** Fund, etc.

- **Key Drivers and Enablers of Space Economy: Growing private sector (**Nearly 200 startups driving innovation**), Institutional reforms (e.g., Indian National Space Promotion and Authorization Centre (IN-SPACe)** consolidating demand), linking of space-based inputs with governance platforms **(e.g., Bhoonidhi portal),** etc.
- **Challenges for Space Economy:**
  - **Limited Global Reach:** E.g., **NavIC's current regional architecture** restricts its international usability.
  - **Underdeveloped Commercial Markets for EO ᴅᴀᴛᴀ:** Due to low enterprise awareness, limited innovation, and fragmented market demand.
  - **Limited Private Sector Participation:** Due to high capital requirements, long incubation periods, and uncertain regulatory frameworks.
  - **Skilled Workforce Shortage:** Due to skills mismatch, Brain Drain, etc.
  - **Tax and Regulatory Uncertainty:** Tax ambiguities regarding GST, digital taxation, and Public-Private Partnership (PPP) revenue sharing pose structural hurdles to scaling EO delivery models.
  - **Other:** Security and strategic concern, increase in space debris with growing space economy, etc.

Israel Becomes First OECD Country To Sign Bilateral Investment Agreement With India

The previous Bilateral Investment Treaty (BIT) signed **between India and Israel in 1996 got terminated in 2017.**

Key Features of India-Israel BIT

- **Boost to Investment:** Increased bilateral investments, which presently stands at a total of **USD 800 million.**
- **Investor Protection:** Balances investor protection with the State's regulatory rights by ensuring a **minimum standard of treatment.**
- **Dispute Resolution:** Facilitating growth of trade and investments with dispute resolution mechanism **through arbitration.**

Evolving Co-operation Between India-Israel

- **Economic:** Bilateral trade was **USD 6.53 billion** (excluding defense) with India's exports surplus in FY 2023-24.
- **Regional Co-operation: I2U2 Partnership's** first summit held in 2022, with India, Israel, UAE, and US participation.
- **Innovation & Science Technology:** E.g., **India-Israel Industrial R&D and Innovation Fund (I4F)** for 5 years (2023–27).
- **Defence:** Co-developed the **Barak-8 missile system,** regular port calls in **Haifa,** etc.
- **Other:** Cultural Exchange Programme, cooperation in health and medicine, MoUs on agriculture and water resource management, etc.

> **Bilateral Investment Treaty (BIT)**
> - **About: A BIT is a reciprocal legal agreement** concluded **between two sovereign States** for the **promotion and protection of investments** by investors in each other's territories.
> - **International Law:** BITs come within **Art. 38 (1) (a) Statute of the International Court of Justice** as primary sources of obligations under public international law.
> - India approved the new **Model BIT text in 2015,** which **replaced Indian Model BIT (1993).**
> - **Recent BITs:** Uzbekistan (2024), UAE (2024), Kyrgyzstan (2025), etc.

World Needs Fair, Transparent Trade System: External Affair Minister (EAM)

At the **virtual BRICS summit** convened to **discuss global trade disruptions,** EAM stressed that economic practices must be **fair and transparent.**

Emerging Challenges for Global Trade

- **Protectionism & Tariffs:** The U.S. imposed **50% tariffs** on Brazil and India (2025), **undermining the WTO's** rules-based system.
- **Weak Multilateralism:** Institutional paralysis at the World Trade Organisation and political gridlocks within the UN are obstructing long-pending reforms.
- **Supply Chain Fragility:** Shocks from COVID-19, **Geopolitical conflicts (E.g. Ukraine war),** selective sanctions, **crisis in key maritime zones (E.g., Red Sea crisis)** exposed global vulnerabilities and fuelled volatility in trade and energy markets.
- **Other:** Food, Energy & Fertilizer Insecurity in global south. Extreme events combined with measures such as the **EU's carbon border tax.**

Proposed Way Forward for India

- **Resilient Supply Chains:** Diversify hubs, as seen in **India's Act East policy and Quad supply chain initiative.**
- **Reform Multilateralism:** Revive WTO and UN processes **(e.g., stalled WTO Appellate Body)** to uphold fairness.
- **Consideration of Refashioning Trade Ties:** With neighboring countries, especially China
- **Aatmanirbhar Bharat Acceleration:** Simplify business hurdles, reduce bureaucratic costs, and ensure a stable policy environment.
- **Other:** Negotiating FTAs with other countries, export promotion by exploring new markets, **Supporting the Global South,** etc.
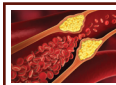
Also In News

Aadhaar

SC directed the poll panel to accept **Aadhaar as the 12th document** in Bihar **Special Intensive Revision (SIR).**

About Aadhaar

- **12-digit random number** issued by Unique Identification Authority of India (UIDAI).
- It contains **Demographic** (Name, Gender, Date of Birth, Address) **& Biometric** (Fingerprints, Iris scans and Facial Photograph) **data.**
- **Section 7 of the Aadhaar Act 2016:** Governments may require Aadhaar for beneficiaries to access benefits or subsidies under schemes funded by the **Consolidated Fund of India or States.**
- **AADHAAR Meta Data:** As per Supreme court Aadhaar data cannot be stored beyond 6 months.
- **Related SC Judgment:**
  - **Puttaswamy Judgment (2018):** SC upheld **constitutional validity of Aadhaar for welfare schemes** and government services.

Cholesterol

Scientists from **INST, Mohali** have introduced **cholesterol-based nanomaterials** as novel platforms for future quantum technologies and spintronic applications.

About Cholesterol

- It is a **waxy, fat-like lipid** belonging to the **steroid family,** produced by the **liver** and also obtained from animal-based foods.
- **Types:**
  - **Low-density lipoprotein** (LDL, **"bad"** cholesterol) can build up in arteries;
  - **High-density lipoprotein** (HDL, **"good"** cholesterol) helps remove excess LDL.
- **Functions:** Essential for hormone production, vitamin D synthesis and building cell membranes.
- **Health Risks:** High LDL increases risk of heart disease and stroke.

Universal Postal Union (UPU)

Union Minister for Communication unveiled the **UPI- (Universal Postal Union) UPU Integration** project aimed at transforming **cross-border remittances.**

About the UPU

- **Established** in 1874.
  - ⊕ It became a **specialized agency** of the UN in 1948.
- **Headquarters:** Berne.
- **It is the second oldest** international organization after the **International Telecommunication Union (ITU) (1865).**
  - ⊕ **Members:** 192 member countries, **India is member.**
  - ⊕ **Function:** Primary forum for cooperation between postal sector players. It helps to ensure a truly universal network of up-to-date products and services.

ULLAS (Understanding of Lifelong Learning for All in Society)

Himachal Pradesh was declared the **fifth State/UT** to achieve full functional literacy, after Tripura, Mizoram, Goa and Ladakh under **Nav Bharat Saksharta Karyakram** also known as **ULLAS.**

About ULLAS

- **Background:** As per the recommendations of the **National Education Policy 2020.**
- **Scheme type:** Centrally sponsored scheme called **New India Literacy Program,** popularly known as ULLAS. **(Ministry of Education).**
- **Duration:** Period of five years, from 2022- 2027.
- **Aim:** To empower all adults aged 15 years and above, who have not had the opportunity to educate themselves.
  - ⊕ It allows one to acquire reading, writing and numeracy skills and critical life skills too.

Pallas's Cat

A wildlife survey by the **WWF-India** captured the **first photo of Pallas's cat in Arunachal Pradesh.**

About Pallas Cat (Otocolobus manul)

- **Physical Features: 30-35 cm tall** with a very **dense fur coat.**
- **Habitat:** Inhabits **rocky steppes, montane grasslands, and shrublands** across Central Asia, including **Iran, Afghanistan, Mongolia, Russia, Pakistan and northern India.**
- **Diet:** Small prey including marmots, pikas, ground squirrels, voles, etc.
- **Conservation Status**
  - ⊕ **Least Concern** on **IUCN Red List.**
  - ⊕ **Schedule 1** of **Wildlife Protection Act, 1972.**

Mhadei Wildlife Sanctuary

Recently, the **Supreme Court stayed projects** in Mhadei Wildlife Sanctuary which is a proposed **tiger reserve** as well.

About Mhadei Wildlife Sanctuary

- **Proclaimed** a wildlife sanctuary in **1999** under **The Wildlife (Protection) Act, 1972.**
- **Location:** North Goa along the **Western Ghats,** bordering Karnataka and Maharashtra.
- **Mahadei (Mondovi) River** flows through the wildlife sanctuary.
- **Fauna:** Tigers, leopards, sloth bears, gaurs, sambar deer, etc.
- **Flora: Moist deciduous vegetation** and some evergreen species, e.g., the rare **Ashoka tree** with peculiar saffron coloured flowers.

Two-factor authentication (2FA)

Recently, Two-factor authentication (2FA) was was mentioned in the news.

About Two-factor authentication (2FA)

- It is an **identity and access management security method** that requires two forms of identification to access resources and data.
- **Mechanism:** Combines two of three factors i.e., something you know **(password),** something you have **(phone, token),** or something you are **(biometrics).**
- **Examples:** OTP codes, authenticator apps, security keys, fingerprint scans.
- **Benefits:** Reduces risk of account breaches, phishing, and identity theft even if passwords are compromised.

Engineering Exports Promotion Council (EEPC)

President Urges Citizens to Make **India Global Hub of Business and Knowledge** during **platinum jubilee celebrations** of **EEPC.**

About EEPC

- **Established:** 1955 under **Ministry of Commerce.**
- **Members: Mostly SMEs (60%).**
- **Head & Registered Office :** Kolkata
- **Activities:** Trade fairs, buyer-seller meets, **market research, export advisory, credit facilitation.**
- **Goal:** Boost **India's global competitiveness** and achieve higher engineering export targets.
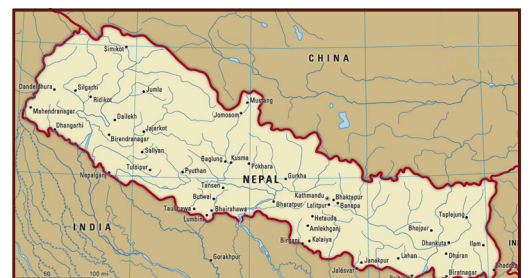
Place in News — 📰 Nepal (Capital: Kathmandu)

Nepal revoked its **social media ban following protests by Gen Z youths,** resulting in **multiple deaths,** prompting the **home minister's resignation.**

Political Features

- **Location:** In South Asia, a landlocked country.
- **Bordering Nations:** China (North), India (South, East, West).
- **Political System:** Federal democratic republic.

Geographical Features

- **Terrain:** Himalayan mountains (North), hills (Center), plains (South).
- **Major Regions:** Terai Plains (Madhesh), the Hill Region (Pahad), and the Mountain Region (Himal).
- **Highest Point:** Mount Everest (8,848.86 m)
- **Major Rivers:** Kosi, Nārāyani (Gandak), and Karnāli.
- **Notable Features:** 8 of world's 14 peaks above 8,000m are loacted in Nepal; **Birthplace of Buddha (Lumbini).**

AHMEDABAD   BENGALURU   BHOPAL   CHANDIGARH   DELHI   GUWAHATI   HYDERABAD   JAIPUR   JODHPUR   LUCKNOW   PRAYAGRAJ   PUNE   RANCHI