

NEWS TODAY

NOBEL PRIZE IN PHYSIOLOGY OR MEDICINE 2023 AWARDED FOR mRNA COVID-19 VACCINES

It was jointly awarded to **Katalin Karikó and Drew Weissman** for their discoveries concerning nucleoside base modifications that enabled the **development of effective mRNA vaccines against COVID-19**.

➤ COVID-19 vaccines made by Pfizer-BioNTech and Moderna are built on mRNA research.

• About mRNA COVID-19 vaccines discovery

➤ Earlier, introduction of mRNA gave rise to **unwanted inflammatory reactions**.

➤ So, they **produced different variants of mRNA**, each with **unique chemical alterations** in their bases (A, U, G, and C), which they delivered to **dendritic cells**.

- Dendritic cells have important functions in immune surveillance and activation of vaccine-induced immune response.

➤ **Inflammatory response was almost abolished** when base modifications were included in mRNA.

• Messenger RNA (mRNA) is a molecule that carries instructions to a cell for making proteins.

➤ Once the protein is synthesised, **immune system escalates a response against it**. In Covid-19 vaccines, protein being synthesised is **Sars-CoV-2's spike**.

• Advantages of mRNA vaccine

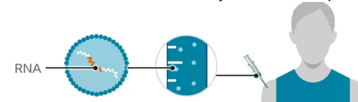
➤ **Non-infectious** and cannot integrate with host DNA.

➤ mRNA can be **quickly designed and scaled up**.

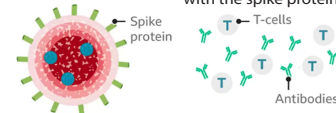
➤ **Generate stronger immune response** as compared to traditional vaccines.

HOW AN mRNA VACCINE WORKS

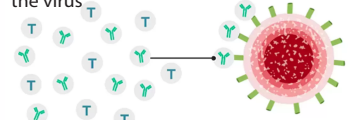
① Scientists take part of the virus's genetic code and turn it into a vaccine that is injected into the patient



② The vaccine enters the cells and tells them to produce the coronavirus spike protein. The body's immune system reacts, produces antibodies and activates T-cells to destroy cells with the spike protein



③ If the patient later catches coronavirus, the antibodies and T-cells are triggered to fight the virus



ABOUT NOBEL PRIZE

• Prizes were established by **will of Alfred Nobel** and first handed out in 1901. Each prize is **worth 10 million kronor**.

• Nobel Prize is an **international award** administered by **Nobel Foundation in Stockholm, Sweden**. **Medicine, physics, chemistry, literature, economics, and peace** are the 6 streams for this prize.

• **Economics award wasn't created by Nobel, but by Sweden's central bank in 1968**.

TRAI RELEASES CONSULTATION PAPER ON "DIGITAL TRANSFORMATION THROUGH 5G ECOSYSTEM"

• 5G is the **5th generation mobile network**. It is a global wireless standard after 1G, 2G, 3G, and 4G networks.

➤ It is meant to deliver **higher multi-Gbps peak data speeds, ultra-low latency, more reliability, massive network capacity, increased availability, and uniform user experience** to users.

➤ 5G services were first **launched in India on October 1, 2022**.

• Applications of 5G

➤ **Healthcare:** Remotely operated **robotic surgeries; track patient's vitals**, detect faults in medical devices etc.

➤ **Agriculture:** Spraying fertilizers; **enable precision farming** by analysing data on soil, weather, crops, and livestock etc.

➤ **Energy:** Enhanced **grid management** by reducing transmission and distribution losses etc.

➤ **Education:** Eliminate **language barrier**, saves teachers from tremendous paperwork, keep track of enrolments etc.

➤ **Manufacturing:** Enable **virtual prototyping, training, assembly and collaboration; maintain equipment** using virtual reality headsets.

• Challenges associated with 5G

➤ **Lax regulatory mechanism** due to its decentralised nature;

➤ Protection of intellectual property rights;

➤ Vulnerability to **cyberattacks**;

➤ **Raise ethical and legal issues** regarding **data ownership**, consent, access, privacy etc.

• **Government's Initiative to facilitate 5G services: 5G Test Bed** for start-ups and MSMEs; **Bharat Net** connecting rural India with optical fibre network; **5G High Level Forum** etc.

PHILIPPINE COASTGUARD DISMANTLED A CHINESE BUOY BARRIER SET UP ON A DISPUTED SHOAL THAT RAISED TENSIONS

● **Chinese Coast Guard ships** had placed a **300-metre-long barrier** to prevent the entry of boats from the Philippines **at the entrance to a lagoon off the Scarborough Shoal** in the South China Sea (SCS).

- Scarborough Shoal, also known as Huangyan Island is a **disputed territory between China and the Philippines.**
- In 2013, the Philippines initiated arbitral proceedings against China **which ruled China's claims were inconsistent with UNCLOS.**
- But China rejected the arbitral tribunal ruling.

● SCS is situated just south of the Chinese mainland and is bordered by the **countries of Brunei, China, Indonesia, Malaysia, Philippines, Taiwan and Vietnam.**

● Significance of SCS

- **Strategic Location:** It is a key commercial thoroughfare connecting Asia with Europe and Africa.
 - At least 55% of India's trade passes through the SCS.
- **Natural Resource:** SCS contains approximately 11 billion barrels of oil and 190 trillion cubic feet of natural gas in proven and probable reserves.

● Issues with SCS

- **Territorial claims:** Several nations assert overlapping territorial claims within the vast expanse of islands, rocks, and archipelagos in the sea.
- **Militarisation of South China Sea:** Both China and US have escalated their military presence in SCS.



SEVENTH ANNIVERSARY OF THE INSOLVENCY AND BANKRUPTCY BOARD OF INDIA (IBBI) SET UP UNDER IBC

● IBBI is a statutory body established in 2016 under the **Insolvency and Bankruptcy Code, 2016 (IBC).**

- It has **regulatory oversight** over the Insolvency Professionals, Insolvency Professional Agencies, Insolvency Professional Entities and Information Utilities.
- IBBI is governed by a **Governing Board constituted by the Central Government.**

● IBC was introduced to **overhaul the corporate distress resolution regime** in India and create a time-bound mechanism for resolution.

- Code is applicable to **Companies, Limited Liability Partnerships, Partnership Firms and Individuals.**

● Successes of IBC

- **Recovery of around Rs 3 lakh crore** through the IBC, since its introduction.
- Resolution of corporate insolvency cases is expected to nearly double to 300 this financial year.

● Challenges

- Huge pendency of cases.
 - Around **5,000 new cases are filed every year under the IBC.**
- Creditors are usually **able to recover only a small percentage** of the admitted claims.
- Average time taken for a corporate insolvency resolution process (CIRP) stands at **635 days for operational creditors (OCs) and 643 days for financial creditors (FCs), above the 270-day limit set by law.**
- **Frequent amendments** (more than 80, since introduction).

9TH ANNIVERSARY OF THE SWACHH BHARAT MISSION (SBM)

● SBM was launched on 2nd October 2014 to accelerate the efforts **to achieve universal sanitation coverage.**

● The mission is split into two:

- **"SBM - Gramin"** under the Ministry of Jal Shakti.
- **"SBM - Urban"** under the Ministry of Housing and Urban Affairs.

● **SBM (G) achieved its task** by generating people's movement at the grassroots level.

● **The government approved Phase II of SBMG i.e. ODF-Plus in 2020** to ensure that open defecation-free behaviours are sustained and that solid and liquid waste management facilities are accessible.

- The programme will be implemented in **mission mode from 2020-21 to 2024-25.**

- Financing through the convergence of

- **Various schemes of the Central and State Governments.**
- **Budgetary allocations** from the Department of Drinking Water and Sanitation
- From grants to Rural Local Bodies
- MGREGS, CSR funds etc.

● SBM-U 2.0 was launched on October 1, 2021, for a period of five years with a **vision of**

- **Achieving Garbage Free Status for all cities through 100% source segregation,**
- **Door-to-door collection and scientific management of all fractions of waste** including safe disposal in scientific landfills.








NEW UN FRAMEWORK TO PROTECT ENVIRONMENT FROM HARMFUL CHEMICALS







- **“Global Framework on Chemicals – For a planet free of harm from chemicals and waste”** was adopted at Fifth International Conference on Chemicals Management (ICCM5) in Bonn, Germany.
 - It is based around **28 targets** that aim to **improve responsible management of chemicals and waste**.
- **Objectives of Global Framework on Chemicals**
 - **Prevention of illegal trade and trafficking** of chemicals and waste.
 - **Phase out highly hazardous pesticides** in agriculture by **2035**.
 - Setting up **policies and regulations** aimed at **reducing chemical pollution by 2030** as well as **promoting safer alternatives**.
- In addition to Global Framework, ICCM5 also adopted the **Bonn Declaration**.
 - Declaration aims to **prevent exposure to harmful chemicals, and phase out the most harmful ones**, where appropriate, and enhance the safe management of such chemicals where they are needed.
- **Impact of harmful chemical**
 - Degradation of ecosystems, **loss of biodiversity, affects soil quality** and reduces the number of micro-organisms that support soil fertility.
 - Immediate and long term health effects like skin or eye irritation, cancer, organ damage etc.

CONVENTIONS THAT DEAL WITH HAZARDOUS CHEMICALS

- **Basel Convention, 1989:** Control of Transboundary Movements of Hazardous Wastes and their Disposal.
- **Rotterdam Convention, 1998:** Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade.

ALSO IN NEWS

 <p>Convention on International Transport of Goods Under Cover of TIR Carnets (TIR Convention, 1975)</p>	<ul style="list-style-type: none"> • Central Board of Indirect Taxes and Customs is canvassing support for India's candidature for TIR Executive Board. • Objective of TIR Convention: Facilitate international transit through a simplified Customs transit procedures and an international guarantee system. <ul style="list-style-type: none"> ➤ It involves common customs document, a common guarantee system, mutual recognition of customs controls and secured vehicle containers. • It is the only universal Customs transit system in existence. • India is one of the Contracting Parties.
 <p>Sammakka-Sarakka</p>	<ul style="list-style-type: none"> • PM announced that Central Tribal University will be established in Mulugu district (Telangana), named after tribal goddesses Sammakka- Sarakka. • Sammakka and Saralamma (or Sarakka), a mother-daughter duo, fought against levy of taxes on tribal people during drought conditions by the then Kakatiya rulers in 12th century. • Sammakka Saralamma Jathara (State Festival of Telangana) is largest tribal religious congregation in country, held every two years (biennially), in Telangana.
 <p>15-minute cities</p>	<ul style="list-style-type: none"> • It is an urban planning concept that advocates putting essential services within walking or biking distance of residents to reduce pollution. • It is a spatial development model to help foster a more local, healthy, equitable and sustainable way of life.
 <p>Operation “Kachchhap”</p>	<ul style="list-style-type: none"> • Directorate of Revenue Intelligence (DRI) saved 955 live baby Gangetic turtles in a crackdown on illegal wildlife trade in multicity Operation “Kachchhap”. <ul style="list-style-type: none"> ➤ India is one of the world's hotspots for turtle diversity, representing 29 species of tortoises and freshwater turtles. ➤ The Ganges river system is home to 13 such species. • DRI, under the Central Board of Indirect Taxes and Customs (CBIC), Ministry of Finance, is the apex agency of the Indian Customs in the field of anti-smuggling in India.
 <p>Kalakkad-Mundanthurai Tiger Reserve (KMTR)</p>	<ul style="list-style-type: none"> • Location: Southern Western Ghats in the Tirunelveli and Kanyakumari districts of Tamil Nadu. • Biodiversity hotspots: Agastya Malai Hill Range forms the core area of the sanctuary. • KMTR is called popularly as River Sanctuary. <ul style="list-style-type: none"> ➤ River Thamirabarani and 13 other rivers originate from KMTR. • Vegetation: Gradually changes from dry thorn forest to dry deciduous, moist deciduous and a patch of West coast wet evergreen forests on the higher reaches of the reserve. • Fauna: Tiger, Leopard, Sloth bear, Elephant, Gaur, Sambar, Mouse deer, Nilgiri langur, Slender loris, Lion tailed macaque, etc.

 <p>Staghorn coral</p>	<ul style="list-style-type: none"> • A genome-wide survey of highly endangered staghorn coral in the Caribbean has identified 10 genomic regions associated with resilience against white band disease. • Staghorn coral is one of the most important corals in the Caribbean. Along with elkhorn coral and star corals it built Caribbean coral reefs over the last 5,000 years. <ul style="list-style-type: none"> ➢ Staghorn coral can form dense groups called “thickets” in very shallow water. ➢ Get food from photosynthetic algae that live inside the coral's cells. • IUCN Status: Critically Endangered. • Threats: Ocean warming; ocean acidification, unsustainable fishing practice and land-based sources of pollution.
 <p>Macrophages</p>	<ul style="list-style-type: none"> • As per Cancer Cell Study, senescent macrophages in the lung promoted tumor growth. <ul style="list-style-type: none"> ➢ Senescent cells do not die and are not usually eliminated from body. They can stay and build in tissues. They are also referred to as “zombie cells”. • Macrophages are a type of white blood cell that acts as the body's first line of defense against infection. <ul style="list-style-type: none"> ➢ They are large, specialized cells that recognize, engulf and destroy target cells.
 <p>R21/Matrix-M (Malaria vaccine)</p>	<ul style="list-style-type: none"> • World Health Organization has recommended second malaria vaccine, R21/Matrix-M, for the prevention of malaria in children. <ul style="list-style-type: none"> ➢ This follows WHO recommendation for the RTS,S/AS01 vaccine in 2021. • R21/Matrix-M vaccine has been licensed for use in Ghana, Nigeria and Burkina Faso. <ul style="list-style-type: none"> ➢ It was developed by Jenner Institute at Oxford University and Serum Institute of India. ➢ Key features: Cost effective, high efficacy, safe in clinical trials. • Malaria is caused by Plasmodium parasites, which are spread to people through bites of infected female Anopheles mosquitoes.
 <p>Military Nursing Service (MNS)</p>	<ul style="list-style-type: none"> • MNS celebrated its 98th Raising Day. • MNS is one of the oldest and most distinguished all-women services in Armed Forces. <ul style="list-style-type: none"> ➢ It holds more than 5,000 officers posted at various hospitals of Armed Forces. • Origin of MNS dates back to Indian Army Nursing Services established in the 1888. <ul style="list-style-type: none"> ➢ On 1st October 1926, Permanent Nursing Service was raised in Indian Army and designated as Indian Military Nursing Service.
 <p>SIMBEX Exercise</p>	<ul style="list-style-type: none"> • It is an annual bilateral naval exercise conducted by Indian Navy and Republic of Singapore Navy.
 <p>Places in News</p>	<p>Maldives (Capital: Male)</p> <ul style="list-style-type: none"> • Mohamed Muizzu is elected as New Maldives President. • Political Boundaries: <ul style="list-style-type: none"> ➢ The northernmost atoll is about 370 miles south-southwest of the Indian mainland. ➢ The central area, including the capital island of Male is about 400 miles southwest of Sri Lanka. • Geographical features: <ul style="list-style-type: none"> ➢ The Maldivian Islands are a series of coral atolls built up from the crowns of a submerged ancient volcanic mountain range. ➢ All the islands are low-lying, none rising to more than 6 feet above sea level. ➢ Barrier reefs protect the islands from the destructive effects of monsoons. ➢ The atolls have sandy beaches, lagoons, and a luxuriant growth of coconut palms. 