1. **AdFalciVax :** Recently, the Indian Council of Medical Research (ICMR) invited domestic vaccine manufacturers to collaborate on the commercial rollout of its newly developed malaria vaccine, **AdFalciVax.**
   - **About AdFalciVax :** A next-generation vaccine developed using recombinant DNA technology to elicit a strong immune response.
     - **Dual Protein Targets**: It expresses two key proteins of the malaria parasite, aiming for enhanced protection compared to current vaccines that target only parasite fragments.
     - **Full-Length CSP Gene**: The vaccine includes the complete gene for the **circumsporozoite protein (CSP),** a major surface protein of **Plasmodium falciparum**, the deadliest malaria parasite. This is expected to generate a more robust and long-lasting immune response.
     - **Transmission Blocking Component**: AdFalciVax also includes a second component aimed at disrupting the parasite's lifecycle within the mosquito, thereby reducing community-level transmission.
     - The vaccine has been developed by **the ICMR-Regional Medical Research Centre (RMRC),** Bhubaneswar.
   - **Current WHO-approved Vaccines**: Existing vaccines like **RTS,S/AS01 (Mosquirix)** and **R21/Matrix-M** mainly target **Plasmodium falciparum**, the most lethal malaria parasite.
   - **India's Dual Burden**: India faces a significant malaria burden not only from P. falciparum but also from **Plasmodium vivax**, which is known for causing recurring infections.
     - Upcoming versions of AdFalciVax may aim to broaden protection to include other malaria-causing parasites such as P. vivax, P. malariae, P. ovale, and the zoonotic P. knowlesi.
2. **INS Sandhayak :** Recently, in a major step towards strengthening maritime cooperation in Southeast Asia, the Indian Navy's 1st indigenously built Survey Vessel Large (SVL), **INS Sandhayak**, made its maiden port call at Port Klang, Malaysia.
   - **About INS Sandhayak :** The first indigenously designed and built vessel of the Sandhayak-class, constructed by Garden Reach Shipbuilders & Engineers (GRSE), Kolkata.
     - **Multi-Role Capabilities**: Equipped for full-scale coastal and deep-water hydrographic surveys, oceanographic data collection, search and rescue (SAR) missions, and humanitarian assistance with onboard helicopter and hospital facilities.



- **Primary Mission**: To conduct hydrographic surveys for ports, harbour approaches, navigational channels, and routes extending up to the Exclusive Economic Zone (EEZ) and extended continental shelf.
- **Secondary Role**: Functions as a hospital ship or offers limited defence support during emergencies or wartime scenarios.
- **Advanced Technologies Onboard**: Features cutting-edge hydrographic tools such as a Data Acquisition and Processing System, Autonomous Underwater Vehicle, Remotely Operated Vehicle, DGPS long-range positioning systems, and digital side-scan sonar.
- **Performance**: Powered by two diesel engines, the ship can achieve speeds exceeding 18 knots.

3. **IT 2.0 APT (Advanced Postal Technology) Application :** Recently, the Department of Posts launched its next-generation **IT 2.0 APT application**, aimed at modernising and transforming India's postal ecosystem.
   - **About IT 2.0 APT Application :** Aims to improve user experience with a more intuitive interface, faster service delivery, and a secure, efficient backend for postal operations.
     - **Comprehensive Digital Integration**: Will support real-time, transparent, and standardised services such as parcel booking, tracking, savings accounts, mail delivery, and grievance redressal.
     - **Deployment Plan**: Includes a scheduled downtime across 36 post offices in Delhi to enable data migration, system validation, and final rollout.
     - **Focus on Efficiency and Accessibility**: Seeks to transform India Post into a technology-driven logistics and financial services provider while ensuring universal access, especially in rural and semi-urban areas.
     - **Commitment to Digital Governance**: Reinforces India Post's role in creating a digitally empowered postal network that supports seamless citizen-centric services.
4. **Grandala** : Recently, a rare electric-blue bird, the **Grandala**, was spotted in the Sainj Valley of Himachal Pradesh. This striking species is known for its vibrant plumage and limited sightings in the region.



- **About Grandala :** A unique bird species in the thrush family (**Turdidae**), and the only species in the genus Grandala.
  - **Diet & Lifestyle**: It is an arboreal insectivore, primarily feeding on insects in trees.
  - **Geographic Range**: Found across the northeastern Indian subcontinent and nearby regions, including Bhutan, India, Nepal, Myanmar, and parts of China like Tibet.
  - **Preferred Habitat**: Inhabits alpine and subalpine zones, typically at elevations of 3,000 to 5,000 meters.
  - **Features**: **Size**: Body length ranges from 20.5 to 23 cm; weight between 38 to 52 grams.
    - ✓ **Male Plumage**: Striking blue-gray body with black wings and tail.
    - ✓ **Female Plumage**: Brownish body with white stripes, gray-blue rump, and white-tipped wing feathers.
    - ✓ **Flocking Behavior**: Known for forming large flocks, sometimes up to 200 birds especially during the non-breeding season.
  - **IUCN Red List**: Classified as **Least Concern**

5. **GenTIGS :** Recently, the Tata Institute for Genetics and Society (TIGS), Bengaluru, developed **GenTIGS**, a gene database aimed at facilitating the early identification and diagnosis of rare genetic disorders.
   - **About GenTIGS :** An integrated gene database that catalogs **genes and pathogenic variants** linked to **rare genetic disorders (RGDs)**.
     - It is designed to **simplify access and analysis** of data related to RGDs and their associated **genetic mutations**, such as: **Nonsynonymous mutations**, **Microsatellites** and **Gene duplications**
     - **Key Information Provided:** Globally and Indian-prevalent rare genetic disorders
       - ✓ Causative genes and specific mutations
       - ✓ Descriptions of the disorders
       - ✓ Gene Ontology (GO) terms
       - ✓ Clinical interpretations and Cross-references to external genomic databases

- **Features :** Offers **flexible search options** and a **user-friendly browser**.
  - ✓ Includes **hyperlinks to various external datasets** for in-depth exploration.
  - ✓ Supports **both experimental and computational research** on rare disorders.
- **Built using data from:** Published scientific research
  - Existing genomic databases
  - The latest **Human Genome** sequence data
  - Variants in **GenTIGS** are mapped to **IndiGenomes metadata** for accurate annotation and understanding of disease associations

6. **Bitra Island :** Recently, in a move with significant implications for the Lakshadweep archipelago, the administration has been considering the acquisition of **Bitra Island** for defence and strategic purposes.
   - **About Bitra Island** : Lies in the **northern part of the Lakshadweep archipelago** and is the **smallest inhabited island** in the Union Territory.
     - A **shrine dedicated to Malik Mulla**, an Arab saint believed to be buried on the island, serves as a **pilgrimage site**.
     - Historically, the island was known as a **breeding ground for numerous seabirds**.
     - **Climate:** Closely resembles that of **Kerala**. The hottest months are from **March to May**, with temperatures ranging between **25°C and 35°C**.
       - ✓ **Humidity remains high**, typically ranging from **70% to 76%** throughout the year.
     - **Strategic Significance:** If acquired for defence, Bitra would become the **third island in Lakshadweep to host a military base**. Currently, the archipelago has two naval bases:
       - ✓ **INS Dweeprakshak** in **Kavaratti** (UT capital)
       - ✓ **INS Jatayu** in **Minicoy**
7. **BioEmu (Biomolecular Emulator) :** Recently, **BioEmu**, a new AI-powered deep learning tool, was developed by Microsoft, Rice University (USA), and Freie Universität (Germany).
   - **About BioEmu:** An advanced **generative deep learning system** designed to predict the diverse shapes a protein can adopt under **biological conditions**.
     - **Working :** BioEmu models the **equilibrium distribution of protein structures**, given an amino acid sequence.

- ✓ It is capable of predicting the **entire range of conformations** that a protein may naturally explore.
- ✓ Compared to traditional **molecular dynamics (MD)** simulations, BioEmu is significantly **faster, cheaper**, and scalable.

- **Applications and Performance:** It effectively captures:
  - **Large conformational shifts in enzymes**
  - **Local unfolding events** that regulate protein activity
  - **Fleeting cryptic pockets**, which are potential drug binding sites (e.g., in the cancer-linked **Ras** protein)
- **Accuracy:** Predicts **83% of large structural shifts**
  - Predicts **70–81% of small changes**, including the open and closed forms of **adenylate kinase**
  - It can also analyze proteins with **no fixed 3D structure** and assess how **mutations** impact stability.
- **Efficiency:** Capable of producing **thousands of protein conformations in minutes to hours** on a single GPU, enabling **high-resolution protein flexibility modeling at scale**.

8. **SIMBEX** : Recently, the Indian Navy announced its participation in the 32nd edition of **SIMBEX** (Singapore-India Maritime Bilateral Exercise), previously known as Exercise Lion King.
   - **About SIMBEX** : Conducted every year between the **Indian Navy** and the **Republic of Singapore Navy (RSN)**
     - **Background**: Initiated in 1994, it has grown into one of the most comprehensive bilateral maritime engagements of the Indian Navy.
     - **Significance**: Supports India's Act East Policy and Vision SAGAR (Security and Growth for All in the Region).
       - ✓ Enhances maritime cooperation, interoperability, and regional stability.
     - **Other Bilateral Defence Engagements with Singapore**:
       - ✓ **Exercise AGNI WARRIOR** – Army-level joint training.
       - ✓ **Joint Military Training (JMT)** – Air Force exercise between the Indian Air Force and the Republic of Singapore Air Force.