



25 December, 2023

## “FLip” mutations of SARS-COV-2

**Context:** Researchers at the University of Tokyo predict that the omicron subvariant JN.1 is poised to become the predominant lineage of the SARS-CoV-2 virus globally in the near future.

- **Emergence and Classification of JN.1 Variant:**
  - ✓ JN.1 designated a Variant of Interest (VOI) on December 18, 2023.
  - ✓ Descendant of BA.2.86 lineage, originating in August 2023.
  - ✓ Rapid surge in recent weeks led to its classification.
- **Genetic Mutations and "FLip" Variants:**
  - ✓ BA.2.86 and JN.1 carry mutations in the spike protein, including L455S (FLip mutation).
  - ✓ FLip mutations switch positions of amino acids, increasing transmissibility.
  - ✓ HK.3 sublineage also acquired L455F mutation.
- **Impact on Transmissibility and Binding:**
  - ✓ "FLip" mutations enhance transmissibility by altering the spike protein.
  - ✓ F456L and L455F substitutions decrease ACE2 receptor binding capacity.
  - ✓ XBB.1.5+F456L and BA.2.86+S:L455S show stronger binding to ACE2.
- **Reproductive Number (Re) and Transmissibility:**
  - ✓ JN.1 exhibits higher effective reproductive number (Re) in France, the UK, and Spain.
  - ✓ Re is an estimate of virus transmissibility in an epidemic.

- **Evading Immunity and Breakthrough Infections:**
  - ✓ JN.1 potentially evades vaccination and displays enhanced ability to evade immunity.
  - ✓ Study shows increased breakthrough infections compared to BA.2.86.

- **Global Impact and WHO Statistics:**
  - ✓ Globally, a 52% increase in cases and 8% decrease in deaths from Nov 20 to Dec 17, 2023.
  - ✓ India records 3,241 new cases and 21 deaths during the same period.
  - ✓ Southeast Asia Region reports a 388% increase in new cases.
- **Testing and Reporting Challenges:**
  - ✓ Reported cases may not accurately represent infection rates due to reduced testing and reporting.
  - ✓ COVID-19 reporting integrated into respiratory disease surveillance globally.
- **JN.1 Prevalence and CDC Warning:**
  - ✓ CDC projects JN.1 to account for 39-50% of all SARS-CoV-2 variants.
  - ✓ JN.1's growth suggests potential higher transmissibility or immune evasion.
  - ✓ Continued monitoring needed to assess the impact on infections and hospitalizations.
- **EG.5 Trends and Global Scenario:**
  - ✓ EG.5 remains the most reported VOI globally but shows declining trends.
  - ✓ Despite JN.1's prevalence, its impact on infections and hospitalizations is uncertain.
- **Vaccination Recommendations:**
  - ✓ INSACOG chief suggests no need for additional vaccine doses except for specific groups.
  - ✓ Caution advised for individuals aged 60 or older, those with comorbidities, and immunocompromised individuals.
- **Global Response and Future Outlook:**
  - ✓ Global response to the evolving situation, with increased monitoring and research.
  - ✓ Uncertainty about the future impact of JN.1 on the spread of infections and healthcare systems.

## Padma Awards

**Context:** Many wrestlers have returned their Padma awards in the issue of appointment of WFI Chief Controversy.

- **Padma Awards Overview:**
  - ✓ Padma Awards are esteemed civilian honors in India, announced annually on Republic Day alongside Bharat Ratna.
  - ✓ These awards recognize exceptional achievements across various fields, emphasizing a public service element.
  - ✓ The total number of awards granted in a year is capped at 120, excluding posthumous and NRI/foreigner/OCI awards.
  - ✓ Importantly, the Padma Award does not confer a title and cannot be utilized as a prefix or suffix to the recipient's name.

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- **Categories of Padma Awards:**
  - ✓ Padma Vibhushan, the highest category, is bestowed for exceptional and distinguished service.
  - ✓ Padma Bhushan is awarded for distinguished service of a high order.
  - ✓ Padma Shri is granted for distinguished service.
- **Eligibility Criteria:**
  - ✓ These awards are open to individuals without distinctions of race, occupation, position, or gender.
  - ✓ Government servants (excluding doctors and scientists) and PSU employees are generally ineligible.
  - ✓ While posthumous awards are typically not conferred, exceptions may be made in highly deserving cases.
  - ✓ A higher Padma award can be given only after a minimum five-year gap from the previous award, with exceptions considered for highly deserving cases.
- **Nomination Process:**
  - ✓ The nomination process involves the constitution of the Padma Awards Committee by the Prime Minister annually.
  - ✓ The committee, headed by the Cabinet Secretary and comprising key officials, reviews nominations.
  - ✓ Recommendations from the committee are submitted to the Prime Minister and the President of India for final approval.
- **Historical Background:**
  - ✓ The Government of India instituted two civilian awards, Bharat Ratna and Padma Vibhushan, in 1954.
  - ✓ Originally having three classes, Pahela Varg, Dusra Varg, and Tisra Varg, Padma Vibhushan was later renamed as Padma Vibhushan, Padma Bhushan, and Padma Shri in 1955.
- **Bharat Ratna**
  - ✓ Bharat Ratna stands as the highest civilian award in India, bestowed in acknowledgment of exceptional service or performance of the highest order across various fields.
  - ✓ Distinguished from Padma Awards, Bharat Ratna recommendations are made by the Prime Minister to the President of India.
  - ✓ The annual cap for Bharat Ratna Awards is limited to a maximum of three, emphasizing selectivity and distinction.

## NEWS IN BETWEEN THE LINES

### Tribunals in India



Recently, the Supreme Court has clarified that tribunals functioning under the strict parameters of their governing legislation cannot direct the government to make policy.

#### Tribunals in India:

- Tribunals are **quasi-judicial bodies** established to handle specific disputes or areas of law outside the traditional court system.
- They are specialized bodies focusing on particular fields like **taxation, environment, administrative, labor**, etc.
- Tribunals follow a less formal procedure compared to regular courts, allowing for quicker resolution of disputes.
- They have the authority to adjudicate disputes, make decisions, and provide remedies like **courts** but operate independently.
- **Article 323A** empowers Parliament to create administrative tribunals (both central and state) for matters related to public servants' recruitment and service conditions.
- **Article 323B** specifies subjects (e.g., **taxation, land reforms**) where Parliament or state legislatures may establish tribunals through enacted laws.
- Tribunals contribute to administrative efficiency by handling specialized **disputes, reducing the burden** on regular courts and providing swift justice in their designated areas.

### Aerogel Fibre



Recently, the researchers have developed knittable aerogel fiber based on polar bear fur structure.

#### About Aerogel Fibre:

- Aerogel fiber is a new type of **functional clothing fiber** with excellent thermal **insulation, moisture absorption** and breathability.
- It has unique properties, such as high porosity, low density and low thermal conductivity.
- It is an ideal material for thermal insulation.
- The fiber has exceptional thermal and mechanical properties and is washable, dyeable and durable.
- It's also suitable for knitting or weaving.
- The fiber is made using aerogel, a thermal insulation material that's mainly used in the aerospace industry.
- The resulting fiber is ultralight and coated with polyurethane.
- It can protect wearers from the cold at a fraction of the thickness needed for conventional sweaters or down jackets.

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## Turquet's Octopus



Recently, genetic analysis of an Antarctic Turquet's Octopus suggests that the West Antarctic Ice Sheet collapsed about 129,000 to 116,000 years ago during a period just 1 degree Celsius warmer than preindustrial levels.

### About Turquet's Octopus:

- Turquet's octopus (**Pareledone turqueti**) is a species of benthic octopus that can be found in the Antarctic.
- It can be found at a wide range of depths, from shallow waters to **4,000 meters deep**.
- It has a mantle length of **15 centimeters**.
- It is characterized by its nearly **smooth skin**, which is covered with **low granular bumps**.
- It also lacks a skin ridge around its body.
- In the wild, **Pata gonian toothfish** and **Weddell seals** prey on **Turquet's octopus**.
- The species has been living in the **Southern Ocean** around Antarctica for about 4 million years having about **12-year lifespan**.
- According to research published in the journal Science, Turquet's octopuses were able to move around a melted West Antarctic Ice Sheet as recently as **125,000 years** ago.
- It has been recorded **least concern in IUCN list**.

## Microbiome



- Microbiome refers to the collection of **bacteria, fungi, viruses, algae, protozoa** and **viruses** present in a particular location, such as the **human eye**.
- The microbiome is a collection of microorganisms that live in a particular environment.
- Microbes are so small that they can only be seen with a microscope, but they contribute significantly to human health and wellness.
- In humans, the microbiome is often used to describe the microorganisms that live in or on a specific part of the body, such as the **skin or gastrointestinal tract**.
- The human body contains around **39 trillion bacteria**.
- Imbalances in the gut microbiota have been linked to **gastrointestinal** conditions like **inflammatory bowel disease (IBD)** and **irritable bowel syndrome (IBS)**.
- They have also been linked to wider systemic manifestations of disease like obesity, type **2 diabetes** and **atopy**.

## Place in News

## Bab el-Mandeb

Recently, the Houthi attacks on tankers passing through the narrow Strait has disrupted one of the busiest global shipping lanes, dragging the U.S. deeper into the conflict.

### About Bab el-Mandeb Strait:

- The Bab-el-Mandeb Strait is a strategic choke point that connects the Red Sea to the Gulf of Aden and the Indian Ocean.
- It is located between Yemen on the Arabian Peninsula, Djibouti and Eritrea in the Horn of Africa.
- The strait's name translates to "Gate of Tears" in Arabic.
- The Bab-el-Mandeb Strait is a crucial trade route that connects the Mediterranean Sea and the Indian Ocean via the Red Sea and the Suez Canal.



## POINTS TO PONDER

- What is the name of the carbon tax that the UK plans to implement from 2027 on imports of materials like steel and aluminium? - **Carbon Border Tax (CBT)**
- Recently, Haryana emerged victorious in the Vijay Hazare Trophy 2023-24 by defeating which team? - **Rajasthan**
- Which country presents the International Gender Equality Prize? - **Finland**
- What is the name of the potato disease responsible for significant damage to potato crops across various districts of Punjab? - **Late Blight**
- Whose forthcoming memoir is titled 'Four Stars of Destiny'? - **General M M Naravane**

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