

## Hardy bacteria

- Researchers have discovered that certain hardy bacteria could survive in the hostile Martian conditions for millions of years, by testing the ability of a selection of 'extremophile' microbes which can live in harsh environments to survive in cold, radioactive conditions similar to those on Mars.
- An extremophile is an organism that thrives in extreme environments.
- The team found that, when dried and frozen, the *Deinococcus radiodurans* microbe could survive under the surface of Mars for 280 million years.
- Hardy bacteria form a hard outer covering called a cyst around themselves.
- They do this when conditions are not favourable, such as under extreme conditions of temperature and dryness. Heart outlined.

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## Thrombosis

- A study sheds further light on the risk of developing a very rare blood-clotting condition known as thrombosis with thrombocytopenia syndrome (TTS) after COVID-19 vaccination with AstraZeneca.
- Thrombosis occurs when blood clots block veins or arteries. Symptoms include pain and swelling in one leg, chest pain, or numbness on one side of the body.
- Complications of thrombosis can be life-threatening, such as a stroke or heart attack.

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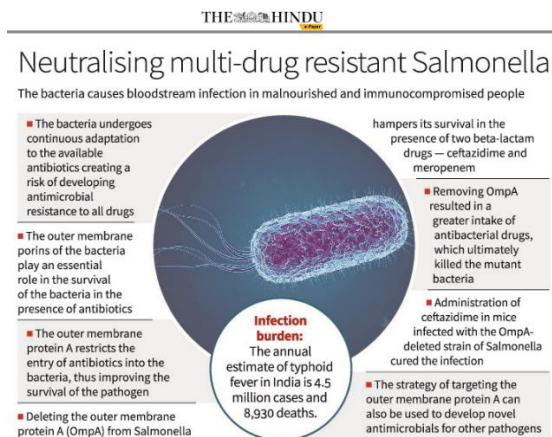
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## Ancient viral DNA

- Previous studies have shown that fragments of ancient viral DNA called endogenous retroviruses in the genomes, of mice, chickens, cats, and sheep provide immunity against modern viruses that originate outside the body by blocking them from entering host cells.
- A type of virus that has RNA instead of DNA as its genetic material. It uses an enzyme called reverse transcriptase to become part of the host cells' DNA.
- A retrovirus is a type of virus that inserts a DNA copy of its RNA genome into the DNA of a host cell that it invades, thus changing the genome of that cell.
- Endogenous retroviruses are endogenous viral elements in the genome that closely resemble and can be derived from retroviruses.
- Now a study (Science) conducted with human cells in culture in the lab has found that the antiviral effect of endogenous retroviruses likely also exists for humans.
- The work reveals the possibility of a genome defence system that has not been characterized but could be quite extensive.
- Endogenous retroviruses account for about 8% of the human genome.
- Retroviruses introduce their RNA into a host cell, which is converted to DNA and integrated into the host's genome.
- The cell then makes more viruses.
- Typically, retroviruses infect cells that don't pass from one generation to the next, but some infect germ cells, such as an egg or sperm, which opens the door for retroviral DNA to pass from parent to offspring.

## AMR salmonella

- The continuous adaptation of this bacteria to the available antibiotics creates a risk of developing antimicrobial resistance in the future.



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## Bipolar disorder

- Brain development starts early during pregnancy.
- This starts with a single layer of cells that roll up to form a tube called the neural tube.
- The brain develops at one end of this neural tube. It is a process that takes up many cell divisions as well as cells migrating through large distances
- The key result of the work is that the neural precursor cells derived from stem cells of people with bipolar disorder showed a difference in the way they migrated as compared to neural precursors derived from stem cells of people without bipolar disorder (Controls).
- Bipolar disorder is a severe disabling illness where a person's mood, energy, activity levels, and ability to carry out day-to-day activities undergo unusual shifts over a period.
- The illness has a genetic basis and neurodevelopmental origin. Many studies have documented abnormalities in the brain structure of patients with BD.

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## CCI against google

- The Google Play Store is a marketplace for apps and services and has a collection of more than three million applications.
- In the current matter involving Google, the CCI examined if the company violated the Competition Act through its policy of requiring app developers to mandatorily use Google Play's billing system (GPBS) not only for receiving payments for paid app downloads but also for in-app purchases.
- The probe also noted that if the app developers did not comply with Google's policy of using GPBS, they would not be permitted to list their apps on the Play Store.
- The CCI thus concluded that making access to the Play Store contingent on mandatory usage of GPBS was "one-sided and arbitrary" and it also denied app developers "the inherent choice to use payment processor[s] of their liking from the open market."
- It also examined the service fee that Google charges developers of paid apps and for in-app purchases. Compared to the 0-3% fee by other payment aggregators in India, the Commission found Google's service fee (between 15-30%) to be excessive, unfair, and discriminatory.

- Google submitted that only 3% of developers on Google Play are subjected to a service fee.
- The current investigation found that in the market for licensable Operating Systems (OS), Google enjoys a dominant position.
- OS is a complex software product needed to run applications and programs on smartphones. Android, which is the most prominent such OS, was acquired by Google in 2005.
- Android is a licensable OS, meaning the developer Google licenses it to smartphone manufacturers like Samsung, Vivo, and so on.
- According to Counterpoint research, 97% of India's 600 million smartphones are powered by Google's Android OS. While Android is an in-principle open-source OS, the CCI found that it is controlled by Google.
- The Commission noted that through its restrictive agreements with smartphone manufacturers, Google made sure that manufacturers who wished to use its proprietary apps such as Chrome, Play Store, and YouTube and so on had to use Google's version of Android.
- The CCI also concluded that the Google Play Store is the largest app store in terms of users, availability of apps, and developers compared to other app stores.
- The order noted that the Play Store, which is a part of the Google Suite (Chrome, Gmail, YouTube, etc.) comes pre-installed in 100% of Android OS devices, and owing to the mandatory pre-installation and entry barriers in the market, users did not have the option of side-loading or downloading apps outside of the Play Store.

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### Doctrine of pleasure

#### What is the concept?

- The pleasure doctrine is a concept derived from English common law, under which the crown can dispense with the services of anyone in its employ at any time.
- In India, Article 310 of the Constitution says every person in the defence or civil service of the Union holds office during the pleasure of the President, and every member of the civil service in the States holds office during the pleasure of the Governor.
- However, Article 311 imposes restrictions on the removal of a civil servant.
- It provides for civil servants being given a reasonable opportunity for a hearing on the charges against them.
- There is also a provision to dispense with the inquiry if it is not practicable to hold one, or if it is not expedient to do so in the interest of national security.
- In practical terms, the pleasure of the President referred to here is that of the Union government, and the Governor's pleasure is that of the State government.
- Under Article 164, the Chief Minister is appointed by the Governor; and the other Ministers are appointed by the Governor on the CM's advice. It adds that Ministers hold office during the pleasure of the Governor.
- In a constitutional scheme in which they are appointed solely on the CM's advice, the 'pleasure' referred to is also taken to mean the right of the Chief Minister to

dismiss a Minister and not that of the Governor.

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## IPCC report and India

### What did the IPCC report state?

- This year's Intergovernmental Panel on Climate Change (IPCC) assessment report stated that climate change has produced irreversible losses to natural ecosystems and has warned of severe consequences to food supply, human health, and biodiversity loss if carbon emissions from human activity are not sharply reduced.
- As per the report, 3-14% of all species on earth face a very high risk of extinction at even 1.5°C, with devastating losses at higher temperatures in the current situation.
- It adds that limiting warming to around 1.5°C requires global greenhouse gas emissions to peak before 2025 and be reduced by 43% by 2030.
- Coal-fired power plants operating without technology to capture and store carbon would need to be shuttered by 2050, a warning relevant to India which operates roughly 10% of global capacity.
- The World Resources Institute also paints a grim picture in its report.
- It suggests that the world needs to curb emissions six times faster by 2030 than the current trajectory to meet the 1.5°C targets. Of the 40 indicators examined, none is on track to reach the 2030 target.
- "Unabated coal-based electricity generation, although declining worldwide, continues to expand across some regions,

while unabated fossil gas-based electricity, is still rising globally," it notes.

- Mitigation measures to keep temperatures below 2°C and the need for climate change adaptation mentioned in these reports are likely to come up for discussion at the COP27.

### Where does India stand?

- India is one of the 197 countries that has promised to limit the increase to no more than 1.5°C by 2030. It is also working on a long-term roadmap to achieve its target of net zero emissions by 2070.
- Prime Minister had committed at the Glasgow summit that the country would get its non-fossil energy capacity to 500 GW by 2030, meet half of its energy requirement from renewable sources and reduce carbon emissions.
- India is the third-largest greenhouse gas emitter in the world. Though India updated its climate pledges in line with commitments made at the previous summit, experts have slammed New Delhi for not setting ambitious targets.
- The Climate Action Tracker, an independent analysis that tracks government climate action classifies India's action as "highly insufficient".
- It says India's continued support to the coal industry undermines a green recovery.

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