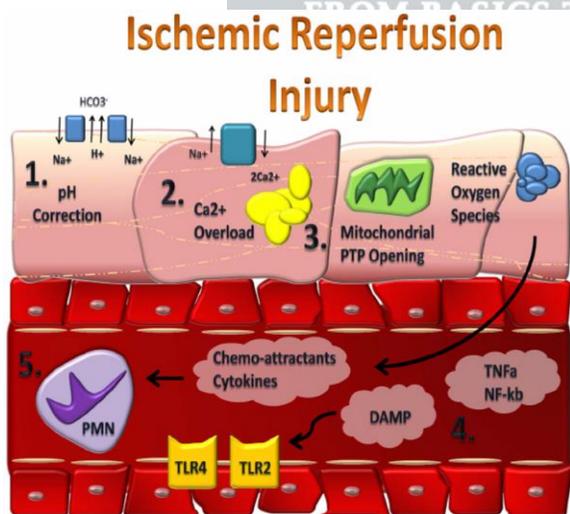


Ischemia/reperfusion injury

- Researchers has discovered a mechanism that contributes to ischemia/reperfusion injury (IRI) in the lung, one of the leading causes of poor outcomes, in transplant recipients.
- Their data show how the channel TRPV4 is activated in IRI in a mouse model, suggesting that TRPV4 of the pathway could offer targets for researchers seeking to boost the survivability of transplanted lungs.
- TRPV4 (Transient Receptor Potential Cation Channel Subfamily V Member 4) is a Protein Coding gene.
- Diseases associated with TRPV4 include Metatropic Dysplasia and Hereditary Motor and Sensory Neuropathy, Type lic.



The Hindu

Microbiome

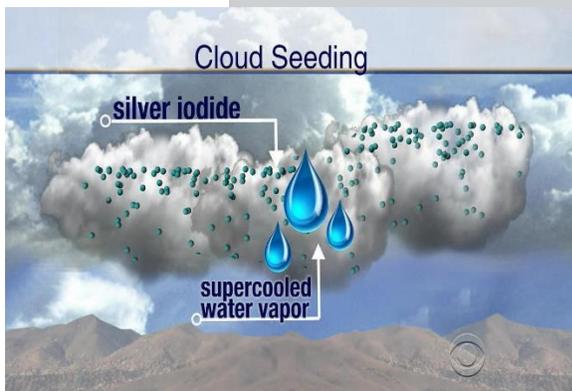
- Parsing data from two clinical trials, researchers have mapped out how the gut microbiome can impact how people respond to teplizumab, a drug that can delay the onset of type 1 diabetes.
- Patients with stronger immune responses against three different gut microbes tend to benefit more from the drug's disease delaying effects. The results show how the immune system's relationship with the microbiome can shape the progression of type 1 diabetes.
- The microbiome is the collection of all microbes, such as bacteria, fungi, viruses, and their genes, that naturally live on our bodies and inside us.
- Although microbes are so small that they require a microscope to see them, they contribute in big ways to human health and wellness.



The Hindu

Cloud seeding

- Cloud Aerosol Interaction and Precipitation Enhancement Experiment (CAIPEEX phase4) was a scientific investigation conducted in Solapur city during the summer monsoon period of 2018 and 2019.
- The primary objective was to investigate the efficacy of hygroscopic seeding in deep convective clouds and to develop a cloud seeding protocol.
- Calcium chloride flare was used for seeding the clouds.
- A cloud seeding flare releases these particles when triggered.
- The seeding was done at the base of the warm convective clouds and at a time when the clouds were in their growing stage so that the seed particles could enter the clouds with minimum dispersion.



The Hindu

Internal structure of mars

- Mars's liquid iron core is likely to be surrounded by a fully molten silicate layer, according to a pair of studies published in Nature.
- These results offer a new interpretation of the interior of Mars, suggesting its core is smaller and denser than previously proposed.
- Seismological study of Mars to understand the interior of the red planet was carried out in 2019.
- The Insight Mars Lander used an instrument called the Seismic Experiment for Interior Structure (SEIS) to record seismic waves passing through Mars's interior
- The analysis of measurements from the NASA Insight Lander's Seismic Experiment for Interior Structure (SEIS) project in 2021 suggested the presence of a large but low-density core, composed of liquid iron and lighter elements such as Sulphur, carbon, oxygen and hydrogen
- The core has a higher proportion of lighter elements than is feasible according to estimates of the abundances of these elements early in Mars's formation history
- The two studies found that the liquid iron nickel core of Mars is surrounded by an approximately 150 km thick

Current Affairs 29th October 2023 by Saurabh Pandey

layer of near molten silicate rock, the top of which was previously misinterpreted as the surface of the core.

- The Criminal Procedure (Identification) Act (CrPI)
- In April 2022, the Criminal Procedure (Identification) Act (CrPI) was passed by Parliament.
- The Act enables police and central investigating agencies to collect, store and analyse physical and biological samples including retina and iris scans of arrested persons.

Why was the legislation brought in?

- The CrPI Act repealed the British-era Identification of Prisoners Act, 1920 whose scope was limited to collecting and recording finger impressions, footprint impressions and photographs of certain category of convicted persons and impressions of non-convicted persons on the orders of a Magistrate.
- The government said the new Act made provisions for the use of modern techniques to capture and record appropriate body measurements.

What is the role of the NCRB?

- The central body has been entrusted with the task to “store, process,

share, disseminate and destroy records of measurements.”

- Impressions taken at any police station will be stored in a common database maintained by the NCRB.
- The database could be accessed by authorized police and prison officials across the country.
- The NCRB will prescribe the specifications of the equipment's or devices to be used for taking measurements in digital and physical format,
- the method of handling and storing measurements by the State police in a format compatible with the NCRB database and also the information technology system to be used for taking the measurements.

What are the challenges?

- When the Bill was being debated in Parliament, Opposition members argued that it violated fundamental rights, including the right to privacy.
- With plans to include DNA samples and facial recognition technology, questions arose about the protection of such data.
- It takes the onus of destruction and disposal of records of an individual from the central database in case a person has been falsely implicated in

Current Affairs 29th October 2023 by Saurabh Pandey

a crime or has been acquitted by the court.

- For such a disposal/destruction, the request will have to be made to the nodal officer.
- “Handling DNA sample requires proper training.
- The storage is also a concern. It is compulsory in offences registered under the Protection of Children from Sexual Offences (POCSO) Act.
- However, what is its scope in other crimes such as cheating and snatching is yet to be spelt out clearly.”

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