

Black corals

- Antipatharians, also known as black corals or thorn corals, are an order of soft deep-water corals.
- These corals can be recognized by their jet-black or dark brown chitin skeletons, surrounded by the polyps (part of coral that is alive).
- Antipatharians are a cosmopolitan order, existing at nearly every location and depth, with the sole exception of brackish waters. Five new species of black corals living as deep as 2,500 feet (760 metres) below the surface in the Great Barrier Reef and Coral Sea off the coast of Australia.
- Black corals can be found growing both in shallow waters and down to depths of over 26,000 feet (8,000 meters), and some indmetersl corals can live for over 4,000 years.
- Many of these corals are branched and look like feathers, fans or bushes, while others are straight like a whip.
- Unlike their colourful, shallow-water cousins that rely on the sun and photosynthesis for Energy, black corals are filter feeders and Eat tiny zooplankton that are abundant in deep water.

What is the difference between hard and soft coral?

- Hard corals, also known as scleractinian and stony coral, produce a rigid skeleton made of calcium carbonate (CaCO_3) in crystal form called aragonite.
- Hard corals are the primary reef-building corals. Colonial hard corals, consisting of hundreds to hundreds of thousands of individual polyps, are cemented together by the calcium carbonate 'skeletons' they secrete. Hard corals that form reefs are called hermatypic corals. Soft coral, also known as Alcyonacea and ahermatypic coral, do not produce a rigid calcium carbonate skeleton and do not form reefs, though they are present in a reef ecosystems.
- Soft corals are also mostly colonial; what appears to be a single large organism is actually a colony of individual Polyps combined to form a larger structure.

What is a filter feeder?

- Filter feeders are a sub-group of suspension-feeding animals that feed by straining suspended matter and food particles from water, typically by passing the water over a specialized filtering structure.

- Some animals that use this method of feeding are clams, krill, sponges, baleen whales, and many fish (including some sharks).

THE HINDU

Measles

- A viral infection that's serious for small children but is easily preventable by a vaccine.
- The disease spreads through the air by respiratory droplets produced from coughing or sneezing.
- Measles symptoms don't appear until 10 to 14 days after exposure. They include cough, runny nose, inflamed eyes, sore throat, fever, and a red, blotchy skin rash.
- There's no treatment to get rid of an established measles infection, but over-the-counter fever reducers or vitamin A may help with symptoms.

THE HINDU

mRNA lipid Nano Particles based vaccine

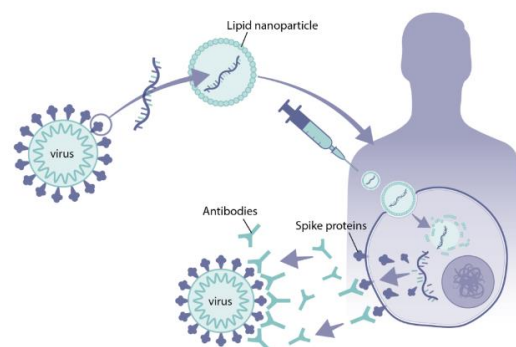
- Researchers have developed an mRNA lipid nanoparticle vaccine that contains antigens from all 20 known subtypes of influenza A and B viruses.
- Universal vaccine is important as it is difficult to predict which flu strain will cause the next flu pandemic.

About Influenza

- Flu (influenza) is an infection of the nose, throat and lungs, which are part of the respiratory system.
- Influenza is commonly called the flu, but it's not the same as stomach "flu" viruses that cause diarrhoea and vomiting.
- Most people with the flu get better on their own. But sometimes, influenza and its complications can be deadly.

How does lipid nanoparticles-based mRNA vaccine works?

- To function in vivo, mRNA requires safe, effective and stable delivery systems that protect the nucleic acid from degradation and that allow cellular uptake and mRNA release.
- Lipid nanoparticles have successfully entered the clinic for the delivery of mRNA; in particular, lipid nanoparticle–mRNA.
- Vaccines are now in clinical use



Leap seconds

What is leap second?

- A leap second is a one-second adjustment that is occasionally applied to Coordinated Universal Time, to accommodate the difference between precise time and imprecise observed solar time, which varies due to irregularities and long-term slowdown in the Earth's rotation
- Metrologists have agreed to stop adding 'leap seconds' to official clocks to keep them in sync with variations in Earth's rotation.
- Leap seconds can disrupt systems based on precise timekeeping because there is no set way to integrate them.
- Earth's rotation has sped up since 2020 normally over the long term, Earth's rotation slows because of Moon's pull.
- So, for the first time, a leap second might need to be removed rather than added.
- The practice of adding leap seconds will be put on hold from 2035



THE HINDU

James Webb telescope

- The James Webb Space Telescope (sometimes called JWST or Webb) is an orbiting infrared observatory that will complement and extend the discoveries of the Hubble.
- Space Telescope, with longer wavelength coverage and greatly improved sensitivity.
- The longer wavelengths enable Webb to look much closer to the beginning of time and to hunt for the unobserved formation of the first galaxies, as well as to look inside dust. Clouds where stars and planetary systems are forming today.
- The James Webb Space Telescope (JWST) is a space telescope designed primarily to conduct infrared astronomy.
- As the largest optical telescope in space, its greatly improved infrared resolution and sensitivity allows it to

view objects too old, distant, or faint for the Hubble Space Telescope. U.S. National Aeronautics and Space Administration (NASA) led JWST's development in collaboration with European Space Agency (ESA) and the Canadian Space Agency (CSA).

- Infrared astronomy is a sub-discipline of astronomy that specializes in the observation and analysis of astronomical objects using infrared (IR) radiation.

THE HINDU

MISSION GOALS

- Search for the first galaxies or luminous objects formed after the Big Bang.
- Determine how galaxies evolved from their formation until now. Observe the formation of stars from the first stages to the formation of planetary systems. Measure the physical and chemical properties of planetary systems, including our own Solar System, and investigate the potential for life in those systems.

THE HINDU

Leprosy

- Leprosy is a chronic infectious disease caused by a bacillus, *Mycobacterium leprae*. *M. leprae*

multiplies slowly and the incubation period of the disease, on average, is 5 years. Symptoms may occur within 1 year but can also take as long as 20 years or even more.

- Leprosy mainly affects the skin, the peripheral nerves, mucosa of the upper respiratory tract, and the eyes. The disease is curable with multidrug therapy.
- Leprosy is likely transmitted via droplets, from the nose and mouth, during close and frequent contact with untreated cases. Untreated, leprosy can cause progressive and permanent damage to the skin, nerves, limbs, and eyes.
- There were 127558 new leprosy cases detected globally in 2020, according to official figures from 139 countries from the 6 WHO Regions.

THE HINDU
