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Plasmodium Vivax Malaria

- Plasmodium vivax is a protozoal parasite and a human pathogen.
- This parasite is the most frequent and widely distributed cause of recurring malaria.
- Recently, an international team has developed a system to breed the parasite Plasmodium vivax in the lab and then infect cultured human liver cells with it.
- The parasite can remain in the liver in a dormant stage and relapse later.
- It can be difficult to detect P. vivax, since it usually circulates at low levels in the blood.
- 4 countries account for more than 80% of estimated cases of P. vivax cases (Ethiopia, India, Indonesia, and Pakistan).
- Certain malaria-endemic countries have even abandoned chloroquine for P. vivax treatment but fortunately chloroquine is still effective in India.
- The currently used anti-relapse drug, Primaquine, has many undesirable side-effects, especially in patients with a genetic defect called

G6PD deficiency

- Glucose-6-phosphate dehydrogenase (G6PD) deficiency is an inherited condition usually occurring in males.
- It is condition causing red blood cells to break down in response to certain medication, infections or other stresses.
- It's more common in those of African and Mediterranean descent.
- Triggers include infections, stress, fava beans, aspirin and other drugs.
- When symptoms are triggered, they include fever, dark urine, abdominal and back pain, fatigue and pale skin.
- Most people recover in a few days without treatment.
- However, patients are at risk of recurrent episodes, so avoidance of triggers is critical.
- The deficiency is chronic and cannot be cured.

India @ 75 Summit

- India @75 Summit is organized by Confederation of Indian Industry (CII).

- It envisions how India should be in her 75th year of independence.
- The summit seeks to bring together all stakeholders including the industry, government, institutions, community groups and individuals to translate the vision into a reality.

Discovery of Exoplanet using Radio waves

- An exoplanet is a planet that orbits a star outside the solar system.
- These exoplanets are hard to detect because they are hidden by the bright glare of the stars they orbit around.
- One of the key features of the exoplanet is that its orbit is wobbly because the star's gravitation is not at its center which makes the phenomenon possible.
- Recently, scientists have been able to discover an exoplanet and a wobbly star using just radio waves.
- In this method, scientists detect an exoplanet via auroras formed on it by the interaction of the star and a strong magnetic field around a planetary body.

Radio waves

- Radio waves are a type of electromagnetic radiation with wavelengths in the electromagnetic spectrum longer than infrared light.
- Radio waves have frequencies as high as 300 gigahertz (GHz) to as low as 30 hertz (Hz).
- The wavelength of a radio wave can be anywhere from shorter than a grain of rice to longer than the radius of the Earth.
- Like all other electromagnetic waves, radio waves travel at the speed of light in vacuum.
- They are generated by electric charges undergoing acceleration, such as time varying electric currents.
- Naturally occurring radio waves are emitted by lightning and astronomical objects.
- Radio waves are generated artificially by transmitters and received by radio receivers, using antennas.

Hydrogen Evolution Reaction

- Hydrogen is projected as one of the next generation low carbon fuels.
- The future of use of hydrogen as a fuel lies in the design of efficient electro catalysts for facilitating electrochemical splitting of water to produce hydrogen.

- The effectiveness of the electro catalyst for the hydrogen (H₂) evolution reaction (HER) largely depends on its ability to lower the potential of an electrochemical reaction maximally, and cost of synthesis (production).
- The commercially used Platinum (Pt) / Carbon (C) catalysts are efficient but expensive and suffer from metal ion leaching or electro catalyst corrosion when used for long duration.
- Metal-organic frameworks (MOFs) and coordination polymers (COPs) are envisioned as the next generation catalysts.
- Centre for Nano and Soft Matter Sciences (CeNS) an autonomous institute under Department of Science and Technology, have synthesized a novel COP consisting of palladium Pd(II) ions.
- The recent invention serve as a source of active sites for H-adsorption, and benzene tetra mine (BTA) chelating ligands capable of better charge transfer.

Co₂ from Geothermal Springs

- Carbon outflux from Earth's interior to the exosphere through volcanic eruptions, fault zones, and geothermal systems.
- They contribute to the global carbon cycle that effects short and long term climate of the Earth.
- Himalaya hosts about 600 geothermal springs having varied temperature and chemical conditions.
- The Himalayan geothermal springs covers about 10,000 square km in the Garhwal region of Himalaya.
- CO₂ in these thermal springs are sourced from metamorphic decarbonation of carbonate rocks present deep in the Himalayan core along with magmatism and oxidation of graphite.
- Most of the geothermal water is dominated by evaporation followed by weathering of silicate rocks.
- Isotopic analyses further point towards a meteoric source for geothermal water.

IC-IMPACTS

- India-Canada Centre for Innovative Multidisciplinary Partnership to Accelerate Community Transformation and Sustainability (IC-IMPACTS) has organized a conference.
- The annual research conference discussed ways of taking the cooperation between the countries to the next level by
 - a. Strengthening existing international connects,

- b. Sharing best practices in multiple areas,
 - c. Initiating new collaborations in government and institutions.
- The major focus areas of research cooperation under the IC-IMPACT are
1. Green buildings and smart cities.
 2. Occupant's survivability in buildings during fires.
 3. Integrated water management & safe and sustainable infrastructure.
 4. Health problems arising from water-borne and infectious diseases.

Undersea Optical Fiber Cable

- India's first-ever undersea optical fiber cable has been introduced as part of a new project for Andaman and Nicobar Islands.
- The cable system will help provide for faster internet speeds and get rid of the cobweb of wires needed for the same.
- The 2,312-Kilometers long submarine optical fiber cable project connects Chennai - Andaman and Nicobar Islands (CANI).
- The project allow for high-speed broadband connectivity, i.e. 400 Gbps for Port Blair and 200 Gbps for other islands.
- The project can be used by all the telecom operators for mobile and internet services.
- Apart from Port Blair, the cable will cover other islands namely Swaraj Dweep (Havlock), Long Island, Rangat, Little Andaman, Kamorta, Car Nicobar, and Greater Nicobar.



Source: PIB, the Hindu, Indian Express