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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.

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Source: PIB, the Hindu, Indian Express

