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Ask the right questions, and nature will open the door to her secrets
- Dr. C.V. Raman, The Nobel Prize in Physics 1930

IITians build model of brain to find cure for Parkinson

Researchers from Indian Institute of Technology (IIT) Madras, in an effort to find a cure Parkinson's diseases, have through simplified modeling of the brain, found energy deficiency in certain cells, called dopaminergic cells in a portion of the midbrain called substantia nigra pars compacta (SNc). The researchers, in the next five years, through personalized care, would focus to improve the efficiency of energy delivery to these cells, which might cure Parkinson's Disease.

Experts probe Diptheria threat

An international and Indian team of researchers have used genomics to map the infection, caused by the bacterium Corynebacterium diphtheriae, known as Diphtheria, in light of possible increase in cases and the impact of COVID-19 on vaccination schedules in different parts of the world. The researchers have analysed genomes from 1896 to 2019 and found that the average number of antimicrobial resistance (AMR) genes per genome was increasing each decade and thus researchers will conduct studies and forecast vaccine escape and antitoxin treatment failure in future.

IITians exhibit effectiveness of fluid-repelling material

Researchers from Indian Institute of Technology (IIT) Bombay studied how modifying the solid surfaces made of fluid-repelling materials change the fluids' flow by placing a vertical cylinder, coated with water repellant paint in a water tunnel and varying the speed of the water. The researchers have hypothesized that, if cars are coated with such paint, reasonable reduction in fuel consumption of various vehicles in water and air are yielded.

IITians exhibit value of Amalaki

IIT-Guwahati researchers have developed drug development methods to understand the therapeutic action of Ayurvedic formulations, known as Amalaki Rasayana. In the study, researchers have shown how Amalaki Rasayana reduces high blood pressure-induced structural and functional changes in the heart through in-vivo studies in small animals, gene-expression and proteomics analysis.

IIT Bombay researchers produce magentism from current

In a new study, a group of researchers from the Indian Institute of Technology Bombay (IIT Bombay) have demonstrated the inverse effect of generating magnetism through electricity, for the first time in a ferromagnet, a type of naturally-occurring magnetic material, which measures only a few atomic layers thick. To observe the inverse effect, the researchers varied the current in the circuit and placed another circuit close to the thin film. When the researchers passed a varying electrical current through the first circuit, they found that the magnetisation of the thin film changed with time. This, in turn, gave rise to an electric field strong enough to cause the flow of electric current in the other, independent, electric circuit. The researchers have demonstrated that, with the help of this inverse effect, they could control the magnetisation as well as its direction without having to rotate it mechanically. This control, the researchers think, can help them in creating memory (or storage) devices. By controlling the external circuit, they can generate the magnetisation in two distinct states, depending on the direction of the magnetisation. This would enable them to make binary states, the building blocks of modern electronics. The inverse effect also demonstrates how information about an external field propagates through a magnetic material using a fundamental property of its constituents, the electrons.

IIA researchers shed light on Jupiter's metal-rich environment

Researchers from the Indian Institute of Astrophysics (IIA), under the Department of Science and Technology (DST), and the Tata Institute of Fundamental Research explored connections between the planet and host star properties, which can help in understanding how planets form and evolve at large orbital distances. Correlation between star and planet properties can provide vital clues about the possible formation and evolution scenarios. This finding seems consistent with an existing model called the core accretion model of planet formation, which is the most commonly accepted mechanism for the formation of Jupiter-like planets, where rocky core forms through the coagulation of planetesimals until it is sufficiently massive to accrete a gaseous envelope

IITians propose non-leachable antimicrobial coating

Study by the research group by Department of Materials Science and Engineering from Indian Institute of Technology (IIT), Delhi, has proposed a non-leachable antimicrobial coating as a measure to deal with the danger of infections related to implants. The research team created a biodegradable 3D printed polymeric implant, which is modified with anti-infective polymer brushes. The implant itself is fabricated from a blend of completely biodegradable polyesters, which inhibts bacterial growth and discourages colonization on the surface of the medical implant for proloned period of time.

Special Update: Tata Centre for Technology and Design

The Tata Centre for Technology and Design (TCTD) at IIT-Bombay has been established for the purpose of developing and designing technology solutions to take on the unmet needs of resource-constrained communities within India and across the world. Using an end-to-end innovation approach, TCTD acts as a virtual centre with research and academic components. The centre's focus areas include agriculture and food, education, environment, health, housing, water and waste management.

Further details can be found at:
http://www.tatacentre.iitb.ac.in/