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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

NBRC and IIT researchers analysed brain processing of rhythmic tones

Researchers from Cognitive Brain Dynamics Lab, National Brain Research Centre (NBRC), Manesar and the Indian Institute of Technology (IIT), Jodhpur investigated how the brain processed building blocks of music such as rhythmic tones with fixed frequency on the right side of the brain. The researchers measured the brain's electrical activity using a non-invasive method called Electroencephalography (EEG), where the researchers created directional maps of how information flowed among brain areas using a method called Granger causality. This study could help understand pathologies of communication disorders, including learning disorders, autism spectrum disorders, and other mental disorders.

IISER researchers designed organic molecules for easier proton transport

Researchers from the Indian Institute of Science Education and Research (IISER), Bhopal designed organic molecules to create conductive channels for easy transport of protons. Researchers used a nature-inspired approach to design helical organic scaffolds, which could be used for efficient solid-state proton conductivity without having any charged residues attached to them. Thus, new design strategies for creating more stable, lightweight, and efficient proton conductors from organic molecules are vital for the next generation of energy storage.

India researchers made breakthrough in the fight against FRDA

Researchers from the Genomics and Molecular Medicine, Council of Scientific & Industrial Research (CSIR)-Institute of Genomics and Integrative Biology (CSIR-IGIB), and Neurology Department, Neurosciences Centre, All India Institute of Medical Sciences (AIIMS), New Delhi, accurately estimated the number of DNA trinucleotide (GAA) repeats in Friedreich's ataxia (FRDA) patients. Researchers used a nanopore sequencing-based approach to enable more effective resolution of genotype-phenotype correlations in FRDA patients. FRDA is a hereditary disorder, which causes both neurological and movement-related problems. Research conducted by scientists had for the first time explored a high-throughput method to determine the precise sequence of GAA repeats. The study demonstrated the association between late-onset FRDA and disrupted GAA sequences to help predict the disease course, prognosis, and its management.

ICAR researchers suggested techniques to domesticate wild plants

Researchers from Indian Council of Agricultural Research (ICAR)-National Rice Research Institute, Cuttack, Odisha and the National Academy of Agricultural Sciences, New Delhi suggested genome editing technologies to fasten the process of crop domestication for sustainable food production. In their study, the researchers reviewed the demonstrated examples of 'new domestication' of wild plants like ground cherry, wild tomato, wild rice, and sea barley grass. The team installed the desired genetic variation precisely in a target gene, using the clustered regularly interspaced short palindromic repeats (CRISPR)-Cas technology. The research team also shared other technical know-how for efficiently applying CRISPR-Cas in wild species, to bring them into mainstream agriculture.

Special Update: IIG Researchers probe harmful plasma waves in Indian Antarctic station, Maitri

A team of scientists from the Indian Institute of Geomagnetism (IIG), an autonomous institute of Department of Science & Technology (DST), identified Electromagnetic Ion Cyclotron (EMIC) waves, a form of plasma waves in the Indian Antarctic station, Maitri, and studied its characteristics. Researchers analysed data collected from 2011 to 2017 by the Induction Coil Magnetometer data in the station and demonstrated that short-period modulation of such wave events is common and dependent on EMIC wave frequency. The plasma waves play an important role in precipitation of killer electrons, which form the radiation belt of planet Earth and are hazardous to space-borne technology/instruments such as satellites.