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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

IISc Bengaluru presented new insight into foodborne diseases

Researchers at the Indian Institute of Science (IISc) Bengaluru used cell culture and animal model-based experiments to study the host-pathogen interactions of how protein in Salmonella called SopB used mechanisms to avoid being destroyed by the human immune system. Salmonella is a type of bacteria found in a variety of foods, including meat, eggs, and dairy products, which can evade the immune system and survive in specific cells in the body called macrophages (infection-fighting cells) and thus cause gastrointestinal and typhoid diseases in humans. This discovery would help in understanding how Salmonella evades the immune system and shed light on potential new therapies to fight the infection.

TIFR proposed novel method for fossil fuel reduction

Researchers at the Tata Institute of Fundamental Research (TIFR), Mumbai proposed a Carbon dioxide (CO_2) reduction mechanism using a redox pathway assisted by hydrogen to reduce emissions of anthropogenic CO_2. Using the concept of Strong Metal Support Interactions (SMSI) and defect site cooperativity, the team reported a catalyst with active copper sites loaded on titanium oxide-coated dendritic fibrous nanosilica (DFNS/TiO_2-Cu) for CO_2 to Carbon monoxide (CO) conversion. The fibrous morphology and high surface area of DFNS/TiO_2 allowed better dispersion and high loading of copper nanoparticles active sites and showed excellent catalytic performance for CO_2 reduction with CO productivity, superior to all copper-based thermal catalysts.

IIT-Madras commercialized state-of-the-art software for photoelastic analysis

Indian institute of Technology (IIT-Madras) entered a licensing and monetisation agreement with Online Solutions (Imaging) Private Limited, Chennai for licensing four state-of-the-art software packages in the field of photo elastic analysis and simulation. Besides photo elasticity application in agricultural and medical fields, it has novel applications in civil, mechanical and manufacturing engineering fields and also in identifying defects in 3D electronics. The application of photo elasticity has increased for solving domain specific issues, where doctors, agriculturists and biologists could authentically process recorded images using the software for deriving important conclusions from their studies.

TIFR, NCBS and SASTRA conducted study on virus-immune plants

Researchers from the National Centre for Biological Sciences (NCBS), Tata Institute of Fundamental Research (TIFR), Bangalore and the Shanmugha Arts, Science, Technology & Research Academy (SASTRA) University, Thanjavur, studied one of the several intricate molecular pathways a virus, like Begomovirus takes, which turns the host-plant into a virus-copying zombie factory. The begomoviral infection was found to meddle with the normal function of the plant cell's chloroplast, which is the plant cells' major food processing factory and is responsible for converting solar energy to chemical energy that animals consume to survive. Begomovirus infection leads to yellowing and vein clearing patterns on leaves. The yellowing symptoms are visible in various other pathogenic invasions, including devastating bacterial and fungal infections. The research team found that a viral protein named βC1 degraded the chloroplast DNA code during infection to disrupt its anti-viral chemical synthesis.

Special update: IIT-Kanpur collaborated with AW&EIL

Indian Institute of Technology (IIT) Kanpur's technology business incubator, the Startup Incubation and Innovation Centre (SIIC), signed a Corporate Social Responsibility (CSR) Agreement with Advanced Weapons and Equipment India Limited (AW&EIL), one of the seven new Defence Public Sector Undertakings (PSUs) formed by converting the Ordnance Factory Board (OFB) into fully government-owned enterprises. The anticipated outcome of this collaboration is to establish a dynamic startup ecosystem that promotes revolutionary research and development, generates employment opportunities, and positions India as a leading innovator on the global stage.