Embassy of India, Berne

# INDIA SCIENCE AND INNOVATION WEEKLY

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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*

## IIT Madras Metabolically Engineer Plant Cells to Increase production of Anti-Cancer Drug Camptothecin

Researchers at the Indian Institute of Technology (IIT) Madras and (IIT) Mandi metabolically engineered the plant cells of Nothapodytes nimmoniana to increase the production of Camptothecin, which is used to treat cancer. The researchers from the Plant Cell Technology Lab of IIT Madras developed a genome-scale metabolic model for N. nimmoniana plant cells using Computational tools. This could be a major boost to produce cancer-treating drugs as Camptothecin, the third most in-demand alkaloid, is commercially extracted in India from Nothapodytes nimmoniana, which is an endangered plant.

## Green Propulsion System Successfully demonstrated in-Orbit Functionality

A Green Propulsion System, developed under the Technology Development Fund (TDF) scheme of Defence Research & Development Organisation (DRDO), successfully demonstrated in-orbit functionality on a payload launched by PSLV C-58 mission. This project 1N Class Green Monopropellant thruster for altitude control and orbit keeping of micro satellite was sanctioned to a Bengaluru-based start-up Bellatrix Aerospace Pvt Ltd. The Telemetry Data from PSLV Orbital Experimental Module (POEM) at ISRO Telemetry, Tracking and Command Network (ISTRAC), Bengaluru has been validated with ground level solution and is found to have exceeded all performance parameters.

## IIT Delhi Developed Real-Time Bioelectrochemical Sensor for Rapid Water Quality Monitoring

Researchers at the Electromicrobiology Group at Indian Institute of Technology (IIT) Delhi's Department of Biochemical Engineering and Biotechnology developed a sensor for real-time water quality monitoring using electricity-generating microorganisms. Known as "electroactive microorganisms", these microbes generate an electrical current and are widely researched for power generation but can also be used for biosensing. Researchers also added that such technology could act as an early-warning system to be used in tandem with conventional monitoring methods that can be expensive or not amenable to 24/7 operation. The sensor responded to a number of pesticides and could be used repeatedly for long-term monitoring, a crucial feature for areas frequently exposed to water contamination. In the future, such technology may also be useful for detecting emerging contaminants that are not typically covered in routine tests.

## Siemens Healthineers - IISc Inaugurated AI lab for Precision Medicine

Indian Institute of Science (IISc) Bangalore and Siemens Healthineers inaugurated the Siemens Healthineers-Computational Data Sciences (CDS) Collaborative Laboratory for AI in Precision Medicine at IISc Bangalore. The laboratory, backed by Siemens Healthineers' corporate social responsibility initiative, would focus on developing open-source AI tools for automating the precise segmentation of pathological findings in neuroimaging data. This initiative aims to enhance the accurate diagnosis of neurological diseases and analyze their clinical impact at a population level. The collaborative efforts are expected to yield smart solutions contributing to precise diagnoses and evidence-based treatments, ultimately aiming to save lives.

## Special Update: IIT Madras Claimed That a Unique Signature Could be Developed Through Human Breath

Researchers at the Indian Institute of Technology (IIT) Madras claimed that a unique signature could be developed through human breath, which would prove vital in medical as well as other sectors including smartphones. Dept. of Applied Mechanics and Biomedical Engineering is working on using human breath to create a unique signature. When the technology is developed into practical applications, it could be used in the medical field and for biometric applications such as unlocking cell phones and opening doors based on data from human breath. The team is testing a hypothesis that the structure of turbulence in exhaled human breath could be exploited to build biometric algorithms and relies on the idea that the extrathoracic airway is unique for every individual.