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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

Researchers Studied Microbial Interactions in International Space Station

Researchers at Indian Institute of Technology Madras (IIT Madras) and NASA Jet Propulsion Laboratory (JPL) studied the interactions between microbes in the International Space Station (ISS). The study would help devise strategies for the disinfection of space stations to minimise any potential impact of microbes on the health of astronauts. Researchers commented that during spaceflight, crews might altered immunity and limited access to terrestrial medical facilities. Therefore, studying the microbes inhabiting the space station becomes important to understand the risks associated with short-term and long-term space travel on the health of astronauts.

Indian Researchers Developed a New Technique to Assess Fracture Recovery

Researchers from the Indian Institute of Technology (IIT) Guwahati developed a new technique, which is based on an artificial intelligence (AI) simulation model, that could be helpful in predicting the improvement in fractures of the thigh bone after surgery. In addition, this technique could also help the surgeon to choose the right implant or procedure before the surgery required for fracture healing. Researchers commented that this technique may be used to assess the healing outcomes of various fracture fixation strategies. Further, the study could be instrumental in improving the rate of accurate and effective decision making in orthopedics, thereby helping to reduce the cost and disease burden associated with fracture recovery and the model could also be adapted for veterinary fractures.

Researchers Develop Reusable, Paper-based Lycopene Sensors

Indian researchers from the Institute of Nano Science and Technology (INST), Mohali, developed a nano-biosensor for detecting 'lycopene', a phytochemical with high commercial value. The sensor uses a portable smartphone-based upconverting reusable fluorescent paper strip. Researchers also found that the newly developed transparent strip offers minimal scattering with maximum sensitivity despite not using any metal quenchers, in comparison to previous paper strips. This transparent Upconversion Nanoparticles (UCNPs) strip has been found to be sensitive to lycopene with a detection limit as low as 10 nM. A simple smartphone camera can be used for detection. Upconversion is a process where light could be emitted with photon energies higher than the light generating the excitation. Researchers also added that Lycopene is a carotenoid found in tomatoes, grapefruit, watermelons, and papaya & it is a potent antioxidant that helps prevent cancer, heart disease, and macular degeneration.

IIT Madras Developed Efficient & Cost-Effective System to Carry Crops from Fields to Collection Points

Researchers from the Indian Institute of Technology Madras (IIT-Madras) in collaboration with a farmers NGO developed a unique, efficient and cost-effective agricultural transportation system that addresses labour shortage, a major issue faced by Indian farmers. The transportation system, which is a lightweight monorail type, could economically carry agricultural produce from the fields to collection points near the farmlands and had been successfully tested the prototype cableway system at a farm in Nanjai Thottakurichi village of Karur district in Tamil Nadu.

Special Update: IIT-Madras Developed an Indigenous Technology that could Produce New-Generation Super-Abrasive Tools

Researchers from the Indian Institute of Technology Madras (IIT-Madras) develped an indigenous technology which could produce new-generation multi-point/single-layer superabrasive tools with remarkably striking attributes of high crystal exposure above bond level for advanced grinding applications to meet high productivity and energy-efficient material removal requirements. The tools produced also have enhanced tool life. Researchers used advanced chemical bonding technology with an application-specific novel formulation of filler material and controlled spacing of grits on the tools by an indigenously developed semi-automatic grit-printing device. The team recommended application-specific-advanced coatings to develop such new-generation superabrasive tools.