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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 Mandi Researchers found Key Protein Structure in COVID-19 Virus

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Researchers at IIT Mandi revealed and elucidated part of structure of a key protein in the COVID-19 virus, which helps in understanding its mode of action, its role in the spread and severity of the disease and development of antiviral therapeutics. IIT Mandi researchers experimentally studied the structural conformations of SARS-CoV-2 Non-Structural Protein 1 (NSP1) under various conditions i.e. in an organic solvent, membrane mimetic environment and inside liposomes. By using analytical techniques, researchers showed dynamic changes in the conformation of the IDR of the NSP1, in response to its surroundings, due to hydrophobic and electrostatic interactions between the protein and the environment.

IIT Guwahati Developed Smart Window Materials for Automatic Climate Control of Buildings

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Researchers at IIT Guwahati developed smart window materials for automatic climate control of buildings, which can be helpful in designing smart climate control systems in buildings to save energy and reduce carbon emissions. IIT Guwahati designed the smart window 'glasses' using noble metals as well as relatively inexpensive alternatives that can dynamically control the intensity of transmitted solar radiation, depending upon the weather/climate condition.

Startup Incubated at JNCASR Developed Efficient Catalysts & Methodologies for the Conversion of CO₂ to Methanol

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Startup 'Breathe Applied Sciences', incubated at Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), an autonomous institute of Department of Science and Technology Govt. of India developed a recycling carbon technology for an efficient catalysts and methodologies for the conversion of CO₂ to methanol and other chemicals. The technology led towards improvisation of process engineering to enhance the production of chemicals and fuels from anthropogenic CO₂ generated from various sources. For developing a commercial solution for conversion of CO₂ to chemicals and fuels, the startup 'Breathe Applied Sciences' received the National Award 2021 from **Technology Development Board (TDB)**.

Antibody Test Kit for COVID-19 Developed by DRDO Lab

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Institute of Physiology and Allied Sciences (DIPAS), a Defense Research and Development Organisation (DRDO) laboratory indigenously developed an antibody detection-based kit 'DIPCOVAN' for sero-surveillance of COVID-19. DIPAS also confirmed that DIPCOVAN kit can detect both spike as well as nucleocapsid proteins of SARS-CoV-2 virus with a high sensitivity of 97% & specificity of 99% and it is intended for the qualitative detection of IgG antibodies in human serum or plasma, targeting SARS-CoV-2 related antigens. It offers a significantly faster turn-around-time as it requires just 75 minutes to conduct the test without any cross reactivity with other diseases.

Special Update: Isothermal Forging Technology Developed by DRDO for Aeroengines

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Metallurgical Research Laboratory (DMRL), a premier metallurgical laboratory of Defence Research and Development Organisation (DRDO) developed a Critical Near Isothermal Forging Technology to produce all the five stages of High-Pressure Compressors (HPC) discs out of difficult-to-deform titanium alloy using its unique 2000 MT isothermal forge press for aeroengines, which provides self-reliance in aeroengine technology. DRDO also reported that with this development, India has joined the league of limited global engine developers to have the manufacturing capabilities of such critical aero engine components.