

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

- CSIR-SERC Develops Hybrid Floating Wind-Solar Platform
- Gibbon Genome Decoded, Revealing Clues to Primate Evolution



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CSIR-SERC Develops Hybrid Floating Wind-Solar Platform

- Researchers at Chennai's CSIR-Structural Engineering Research Centre have created a hybrid floating platform that generates both wind and solar power from a single structure.
- Designed for offshore and inland water bodies, it combines large horizontal-axis wind turbines, compact vertical-axis turbines and solar panels to maximize energy output and space efficiency.
- The platform uses a "partially compliant" design—rigid enough for heavy equipment yet flexible enough to move safely with waves.
- The innovation builds on CSIR-SERC's earlier work on floating renewable systems.

Gibbon Genome Decoded, Revealing Clues to Primate Evolution

- CSIR-Centre for Cellular and Molecular Biology (CCMB), has successfully decoded the genome of gibbons, a small ape species.
- The study, published in Cell, found that gibbons have a highly rearranged genome, far more dynamic than that of humans, chimpanzees or gorillas.
- Unique genetic elements in gibbons reshuffle chromosomes during reproduction, accelerating their evolution and helping them adapt to diverse forest environments.
- The findings provide fresh insights into how primates diverged over millions of years and may also improve understanding of human genetic disorders linked to chromosomal rearrangements.

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- Graphene quantum dots can remove mercury from wastewater
- Detecting urinary tract infections to be quicker, cheaper

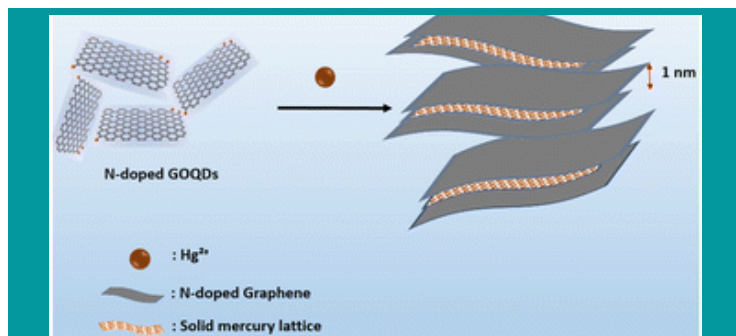


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Graphene quantum dots can remove mercury from wastewater

- A promising method for removal and safe storage of mercury from contaminated water may arise from the conversion of liquid mercury into a solid state by graphene quantum dots, which can trap it for months, without applying external pressures or sub-zero temperatures.
- Mercury is a highly toxic, persistent pollutant, particularly in its ionic form in wastewater.
- Chemists at the University of Calicut and the CSIR-National Institute for Interdisciplinary Science and Technology, both in Kerala, synthesised nitrogen-doped graphene oxide quantum dots.
- When exposed to solution containing mercury ions, the quantum dots formed sheet-like graphene layers. High pressure that only builds up in space between two graphene layers changes liquid mercury to solid particles

Detecting urinary tract infections to be quicker, cheaper

- CSIR-Central Salt & Marine Chemicals Research Institute (CSMCRI), Bhavnagar, have developed a low-cost, rapid test kit for urinary tract infections (UTIs), one of the most common infections, especially among women.
- The U-AST (Urinary Antibiotic Susceptibility Test) kit, created by Saumya Haldar and Maheshwari J. Behere's team, can detect UTIs in just 9 hours, compared to 36–72 hours using conventional lab methods.
- The kit also addresses the need for trained technicians and controlled lab environments, making it particularly useful in rural and semi-urban areas, while significantly reducing diagnostic costs.

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- CSIR-NIIST's technology turns industrial waste into eco-friendly building materials
- MultiPLE-ATMOS: IITR's new device promises to 'wash' air, cut smog



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CSIR-NIIST's technology turns industrial waste into eco-friendly building materials

- CSIR-NIIST, Thiruvananthapuram, has developed a technology to convert foundry sand waste a by product of metal casting into high-strength, eco-friendly bricks meeting IS 1077 standards.
- In collaboration with a private company, the initiative aims to use 30 tons of silica sand daily to produce up to 5,000 bricks per day.
- By studying its reactivity with cement, lime, gypsum and polymer binders, scientists ensured the bricks meet critical requirements for strength, density and water absorption.
- The innovation addresses an environmental challenge while promoting sustainable construction and green industry participation.

MultiPLE-ATMOS: IITR's new device promises to 'wash' air, cut smog

- CSIR-IITR, Lucknow, have developed MultiPLEATMOS, a device designed to reduce key ambient air pollutants including PM2.5, PM10, nitrogen dioxide, carbon monoxide, toxic metals and airborne pathogens.
- Unveiled at the EARTH conference, the machine promises a cleaner breath for cities battling smog, aligning with India's National Ambient Air Quality Standards.



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- CRRI turns paddy stubble into bio-bitumen to combat pollution and reduce imports
- Himalayan apple finds home in Andhra Pradesh



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CRRI turns paddy stubble into bio-bitumen to combat pollution and reduce imports

- North India's recurring problem of paddy stubble burning may soon see a sustainable solution. Scientists from CSIR–Central Road Research Institute (CRRI) and the Indian Institute of Petroleum (IIP) have developed bio-bitumen from paddy straw, offering an eco-friendly alternative to conventional bitumen used in road construction.
- Field trials in Guwahati and on the Nagpur–Mansar bypass (NH-44) have shown promising results.
- At the 84th Indian Roads Congress in Bhubaneswar, Union Minister Nitin Gadkari shared that farmers could soon become not only food and fuel providers but also bitumen producers, turning agricultural waste into valuable resources.

Himalayan apple finds home in Andhra Pradesh

- For decades, apple orchards were associated with Shimla and Kashmir. Today, a horticultural revolution is quietly taking root in Andhra Pradesh's tribal hills of Lambasingi, Chintapalli, and Araku, as farmers transform misty slopes into the South's own apple country.
- The initiative, supported by Hyderabad's Centre for Cellular and Molecular Biology (CCMB), ITDA Paderu, and NGOs like Girijana Vikas, began with detailed climate studies and sapling plantations in villages such as Lambasingi, Kattupalli, Gudem Kothaveedhi, and Madem.
- Tribal farmers received structured training, combining scientific guidance with local expertise to make Andhra Apples a reality.

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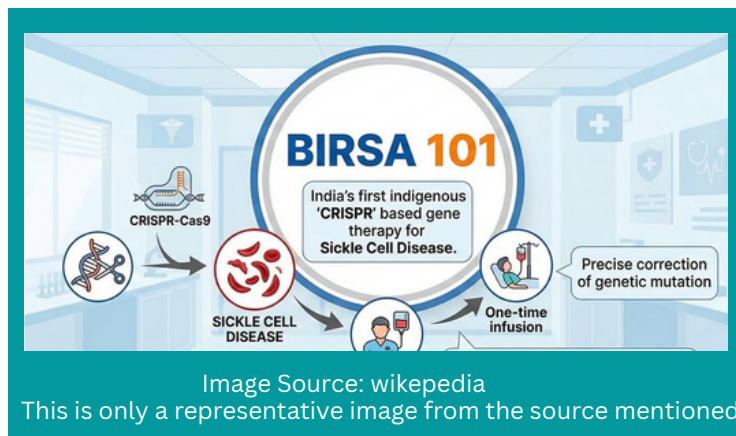


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- Kashmir Launches First Scientific Batch of Lavender Honey



India Launches First Indigenous CRISPR-Based Therapy for Sickle Cell Disease

- Science and Technology Minister Jitendra Singh launched India's first indigenous CRISPR-based gene therapy for sickle cell disease, named "BIRSA 101" in honor of freedom fighter Birsa Munda.
- Developed by CSIR-Institute of Genomics and Integrative Biology (IGIB), the therapy demonstrates India's ability to produce cutting-edge treatments at a fraction of global costs, replacing overseas therapies priced at Rs 20-25 crore.
- A technology transfer and collaboration agreement between CSIR-IGIB and the Serum Institute of India Pvt Ltd will enable the CRISPR platform to be scaled into affordable therapies for sickle cell disease and other critical genetic disorders.

Kashmir Launches First Scientific Batch of Lavender Honey

- In Arihal, Kashmir, beekeeper Zahoor Mir tends to his 80 hives amid rows of lavender and apple orchards, producing what he calls the valley's "new liquid gold."
- For the first time, Kashmir has harvested a scientifically authenticated batch of monofloral lavender honey, validated by CSIR-Indian Institute of Integrative Medicine (CSIR-IIIM).
- This milestone could position India alongside established lavender honey producers like France and Italy, while transforming local farming and creating new income opportunities for farmers.



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