

CSIR IN MEDIA



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NEWS BULLETIN

26 TO 31 DECEMBER 2024



NGRI Says Tremors in Prakasam District Pose No Danger to Life

CSIR-NGRI

31st December , 2024

Scientists of the Hyderabad-based National Geophysical Research Institute (NGRI) have said tremors in the Mundlamuru and Talluru areas of Prakasam district are due to tectonic adjustment within the fault underneath the Gundlakamma River catchment area.

“The vibrations and sounds experienced by people living in the area are natural. They are due to subsurface adjustments going on within the Gundlakamma fault. They are minor and without any signs of turning dangerous,” said Suresh, a scientist from the NGRI.

The Mundlamuru and Talluru areas within Prakasam district have been experiencing a series of tremors since December 21. This prompted a team of scientists from NGRI to conduct a detailed seismic survey of the area, review seismograph data at Addanki and analyse the ground conditions in the region.

Scientists noted that the region lies over the fault underneath the Gundlakamma River catchment area. It experienced a 5.4 magnitude earthquake on the Richter scale in 1967. The recent tremors included an earthquake of 3.1 magnitude, which gradually diminished in intensity over subsequent days.

Scientist Suresh explained that the area falls within Zone 3, wherein mild earthquakes are possible, which are typically not severe. Given the technical data, he asked people living in the area to remain calm, as the tremors and sounds are not a sign of any impending danger.

Published in:

[Deccanchronicle](https://www.deccanchronicle.com)

ICMR develops non-invasive blood test for early breast cancer detection

CSIR-CCMB, IGIB, IMTECH

31stDecember , 2024

CSIR-CCMB and Regional Cancer Centre (RCC), Thiruvananthapuram have identified a cost-effective, non-invasive method to detect breast cancer using a drop of blood. MicroRNA (miRNA) signatures have been analyzed in hundreds of cancer samples, identifying 439 miRNAs linked to invasive breast cancer, with 107 as potential biomarkers for different types and stages of the disease.

CSIR-IGIB and LVPEI develop enhanced CRISPR-Cas9 system for precision genome editing
CSIR-Institute of Genomics and Integrative Biology (CSIR-IGIB) and LVPEI, along with collaborators, have developed an enhanced CRISPR-Cas9 based genome editing system, which is more precise and efficient than existing technologies. The edited and validated Cas9 protein from *Francisella novicida* (FnCas9), creating enFnCas9, showed normal protein expression and no detectable off-target alterations, proving the efficacy and safety of the enFnCas9-based CRISPR tool for precise genome editing. This development is a significant step towards therapeutic applications for genetic disorders in the Indian population, highlighting the importance of advancing gene correction tools for clinical use and market authorization.

CSIR-IMTECH develops promising SARS-CoV-2 vaccine

CSIR-IMTech, Chandigarh, in collaboration with Centre for Infectious Disease Research (CIDR), IISc, Bengaluru and National Institute of Immunology (NII), New Delhi developed a protein subunit-based vaccine candidate, IMT-CVAX, showing “near-complete protection” in preclinical studies. IMT-CVAX is an engineered trimeric spike protein antigen designed to combat SARS-CoV-2 variants, generating robust immune responses in preclinical tests on mice and hamsters. The vaccine’s large-scale production is feasible, with efficient storage in standard refrigerators, making it ideal for mass immunization. IMT-CVAX has been internationally patented, and the study shows its potential to provide long-lasting immunity against future SARS-CoV-2 infections.

Published in:

[Medicalbuyer](#)

C Anandharamakrishnan takes over additional charge as director of NEERI

CSIR-NIIST, NEERI

31st December , 2024

C Anandharamakrishnan, director of the CSIR-National Institute for Interdisciplinary Science and Technology (CSIR-NIIST), Thiruvananthapuram has assumed additional charge as director, CSIR-National Environmental Engineering Research Institute (CSIR-NEERI). He succeeds Atul Vaidya, who superannuated and has recently been appointed as the vice-chancellor of Laxminarayan Innovation Technological University (LITU).



C Anandharamakrishnan is a renowned chemical engineer and academician. Before his tenure as director of NIIST, he served as the director of the National Institute of Food Technology, Entrepreneurship and Management (NIFTEM), Thanjavur, where he successfully translated scientific innovations into practical applications for wealth creation. Anandharamakrishnan aims to continue the rich legacy of CSIR-NEERI, driving impactful research and innovation to benefit both industry and society.

Published in:

[Times of India](https://timesofindia.com)

Tamil Nadu keen on collaborating with CSIR-NIIST: T.N. Industries Minister T.R.B. Rajaa

CSIR-NIIST

31st December , 2024

Tamil Nadu Industries Minister T.R.B. Rajaa has said that the Tamil Nadu government is keen on leveraging technologies and solutions developed by the CSIR-National Institute for Interdisciplinary Science and Technology (CSIR-NIIST) for enhancing productivity in agricultural and industrial sectors of his State.



Mr. Rajaa held discussions with CSIR-NIIST Director C. Anandharamakrishnan and senior scientists during a visit to the institute in Thiruvananthapuram on Monday.

The Tamil Nadu government was seeking fresh ideas and innovative solutions to uplift the State's agricultural, industrial, and micro, small, and medium enterprises (MSMEs) sectors. Collaborations with institutions such as the CSIR-NIIST would pave the way for transformative advancements that would benefit all stakeholders, the Minister was quoted as saying in a statement.

Dr. Anandharamakrishnan highlighted the institute's efforts in developing scalable technologies and expressed willingness to work closely with the Tamil Nadu government for implementing solutions tailored to the State's needs.

Published in:

[The Hindu](https://www.thehindu.com)

CSIR signs MoU with Russian centre for collaboration on marine sciences and technology

CSIR-NGRI

30th December , 2024

The National Institute of Oceanography and the National Geophysical Research Institute have signed a memorandum of understanding with Russia's V.I. Il'Ichev Pacific Oceanological Institute for collaboration on the field of marine sciences and technology, the CSIR said on Wednesday.

The pact will enable Indian and Russian scientists to enhance capacity and skill development in the field of marine sciences and technology, sharing knowledge and expertise in the field of sustainable development for national economic interests of both countries, the statement said.

"This MoU will strengthen cooperation to combat ocean pollution and climate changes, organise scientific expeditions for the search, study and monitoring of ocean resources and environment based on approach of integrated methods for sampling of seabed sediments, rocks and minerals, and advanced geological/geophysical techniques," the statement added.

The V.I. Il'Ichev Pacific Oceanological Institute is the largest research institution in the Far Eastern branch of Russian Academy of Sciences comprising 31 research units equipped with modern scale devices.

The National Institute of Oceanography in Goa and the Hyderabad-based National Geophysical Research Institute of the Council of Scientific and Industrial Research (CSIR) are world renowned institutes in the fields of oceanography and earth sciences respectively.

The MoU was signed virtually by the heads of the institutes on January 12.

Published in:

[Dinamalar](#)

Ninth tulip festival in Delhi: 550K bulbs being planted, bloom in February

CSIR-IHBT

30th December , 2024

The New Delhi Municipal Council (NDMC) has started the plantation of more than 550,000 imported tulip bulbs and the process is likely to be completed in the next two days, with the flowers likely to bloom in February, marking the ninth iteration of the tulip festival in New Delhi, senior NDMC officials said on Monday.

This year's tulip cycle also includes, aside from bulbs imported from The Netherlands, 15,000 "indigenised" tulip bulbs supplied by the CSIR-Institute of Himalayan Bioresource Technology, Palampur (Himachal Pradesh), officials added.

NDMC vice chairman Kuljeet Singh Chahal said that the imported tulip bulbs are being planted at various prominent locations, roundabouts, public places and the diplomatic enclave. "This year NDMC has imported 550,000 tulip bulbs of which 325,000 are for the New Delhi area, 200,000 are for areas under the Delhi Development Authority (DDA) and 25,000 have been provided to the Municipal Corporation of Delhi," Chahal said.

A senior MCD official said that 25,000 bulbs have been planted so far. "The bulbs cost us ₹39 per unit. This is the first time MCD is planting tulips in its areas — its gardeners were given instructional training. We have selected 21 parks and offices where the flowers can be planted. The bulbs are treated to break dormancy and sowed at a depth of 6 inches in well drained soil," the official explained.

Chahal said that the tulip bulbs have been planted at key locations such as Shanti Path, Central Park at Connaught Place, Convention Centre, Lodhi Garden, Talkatora Garden, Sardar Patel Marg, Mandi House, Windsor Place, Shershah Suri Marg, and the Vice President's House roundabout. Additionally, NDMC has successfully preserved 50% of last year's tulip bulbs at a special conservation centre in Lodhi Garden, from which 22,000 bulbs of various sizes have

been planted across different NDMC areas. An NDMC official said that the tulips require a minimum cold temperature of 5°C for two months to break dormancy and sprout. “To tackle this challenge NDMC has purchased pre-treated and pre-programmed bulbs that can thrive even in unpredictable weather conditions,” the official said.

NDMC started planting tulips in 2017-18 with a pilot project of 17,000 bulbs. Before that tulips only grew in the Rashtrapati Bhavan.

Last year, NDMC planted 200,000 bulbs of which 80,000 were planted in the Shanti Path area. The Dutch embassy had also gifted 40,000 bulbs to the council, which have been planted on New Delhi’s roundabouts.

In 2022, the council planted 130,000 tulips. The council had set up one storage chamber in Lodhi Garden last year and a new unit with two more such chambers is expected to come up in the next month.

“Once the bulbs are harvested after blooming in February-March, they can be stored in storage chamber at temperatures varying from $15-20^{\circ}\text{C}$ for three months till July. They are later kept under low temperatures – $5-6^{\circ}\text{C}$ – for 10 weeks till the first week of October. Then these bulbs are put in the production chain by sowing them in a growth chamber at $17-20^{\circ}\text{C}$ to increase their size to at least 10cm,” the official explained.

NDMC to deploy 200 pre-fab structures for flowering plants

NDMC will scale up the deployment of the pre-fabricated structure to display the flowering bloom in the upcoming spring season. Chahal said that the civic body deploy 50 pre-fabricated planters (artificial flower beds) on the concrete central road of Barakhamba Road. “The horticulture department has designed special structures in their nurseries. These include 50 tree-shaped artistic structures with seven flower baskets, 30 artistic arch-like structures with 13 flower baskets, 55 cylinder-shaped structures, and 22 ball-shaped artistic structures,” he

added. The department will also put on display flower pyramids, cone-shaped structures, large round cylinders with 240 flower baskets, and seven heart-shaped structures. “These floral and plant structures will be displayed throughout the NDMC area as needed, with the aim of making NDMC a ‘City of Flowers’. Overall, more than 200 different types of structures will beautify and enhance the New Delhi area,” he added.

Underwater Krishna-Godavari basin landslide can trigger tsunami: Scientists

CSIR-NIO

30th December , 2024

A recent discovery of a huge landslide in the Krishna-Godavari Basin could pose serious risk to underwater structures and might even lead to a tsunami, Goa-based National Institute of Oceanography (NIO) has said. “The huge landslide can displace a huge amount of water and bottom sediments causing even a tsunami,” NIO director Sunil Kumar Singh told TOI.



The NIO scientists discovered the landslide in the Bay of Bengal only recently and reckon that it could have occurred anywhere between 2009 and 2015. “It poses a huge risk to communication cables and oil rigs that are under water, as well as people living on the coast,” the NIO said.

The scientists believe that when the landslide occurred, it caused a massive section of the seabed to collapse, moving around 11 cubic km of sediments enough to fill about 44 lakh Olympic-size swimming pools.

This giant underwater landslide, known as a mass transport deposit (MTD), has created a large fan-shaped deposit on the ocean floor, scientists said. The area that MTD covers is about 70sqkm — about the size of 10,000 football fields. The landslide reached depths between 950m and 1.1km below the ocean surface, and in some places, the deposits are up to 60m thick, NIO said. The landslide was uncovered using special equipment that tracks changes in the ocean floor over time and was one of the largest underwater slope failures ever found in this part of the ocean, the institute said.

Scientists believe several things might have caused this landslide. One important factor could be Cyclone Helen, a Category-1 storm that hit the region in November 2013. The cyclone's powerful winds and strong waves may have triggered the collapse. Other possible causes include extreme flooding events in 2010 and 2013, and a powerful earthquake with a magnitude of 6 on the Richter Scale that shook the Bay of Bengal in May 2014.

NIO scientists said even events like cyclones, heavy rain and earthquakes that seem small on their own can trigger massive underwater landslides, especially if the ocean floor sediments are already weakened.

The institute has warned that the offshore industries working with oil rigs, gas pipelines, and underwater communication cables could face risks from these kinds of underwater disasters.

Scientists are now urging for more research and monitoring of areas like the KG Basin to better understand and predict underwater hazards.

IIT Indore, CSIR-AMPRI ink five -year research pact

CSIR-AMPRI

29th December , 2024

The Indian Institute of Technology (IIT) Indore signed a memorandum of understanding (MoU) with CSIR-Advanced Materials and Processes Research Institute (AMPRI), Bhopal, to enhance research and academic collaborations.

IIT-I and CSIR AMPRI, Bhopal, will collaborate on joint research endeavours encompassing additive manufacturing, graphene and 2D materials, metal-polymer composites and advanced energy materials. The partnership will emphasise innovative projects including the synthesis and characterisation of aluminium alloy foams utilising liquid metallurgy, energy absorption in lightweight structures, and optimisation of foam structures for impact resistance. The five-year agreement was executed by professor Suhas Joshi, director of IIT Indore, and Dr AK Srivastava, director of CSIR-AMPRI whilst Dr Nallathamby Kalaiselvi, director general of CSIR, was present.

Prof Joshi said, "For the mutual benefit of both the organisations, there will be an exchange of faculty/ scientists/ students and technical members of the mentioned organisation for research and academic purposes. We will work closely to generate appropriately trained manpower in the related areas through the organisation of formal academic curricula, symposia, short-term training courses etc. The scientists of CSIR-AMPRI shall be associated as guide and co-guide subject to fulfilment of the requirement of both the organisations." Dr Srivastava said, "The key areas of exploration also include hybrid processing, nanomaterials, superplasticity, and the modelling and simulation of metallurgical processes. This partnership aims to bridge the gap between fundamental research and industrial applications, fostering innovation in critical domains like energy materials, metallic glasses, and metal-ceramic matrix composites."

Published in:

[Times of India](#)

BIT Sindri students win CSIR quiz competition

CSIR-CIMFR

28th December , 2024

A team from the Mining Engineering Department of BIT Sindri, comprising Saurav Chatterjee and Abhay Kumar, has won the prestigious quiz competition organized by the Council of Scientific and Industrial Research (CSIR) in collaboration with the Mining Engineers Association of India (MEAI). The event, held at the Central Institute of Mining and Fuel Research (CIMFR), Dhanbad, was part of the celebrations for Indian Mining Day 2024.



Over a hundred teams from Jharkhand and West Bengal participated in the competition, showcasing their knowledge and expertise. BIT Sindri was represented by two teams, both of which delivered exceptional performances. The winning team, consisting of Saurav Chatterjee, a final-year student, and Abhay Kumar, a third-year student, demonstrated outstanding skill to secure the first position. The second team from BIT Sindri, represented by Satyam Kumar and Vansh Raj, also impressed with their performance, earning a prize in the competition. Dr. Ajay Kumar, Director (Technical) of CMPDIL, and Dr. Arvind Mishra, Director of CSIR-CIMFR, Dhanbad, attended the event as the Chief Guest and Guest of Honor, respectively. Dr. Pankaj Rai, Director of BIT Sindri, congratulated the students on their remarkable achievements and expressed pride in their success. The Head of the Mining Engineering Department, Dr. P.K. Singh, along with other faculty members, also praised the students for showcasing their talent at a national-level competition.

Published in:

[Thejharkhandstory](https://www.thejharkhandstory.com)

ODICHEM-2024, Bhubaneswar

CSIR-IMMT, CIMFR

28th December , 2024

Discusses Challenges and Opportunities in the Mineral Sector

Inaugurating ODICHEM-2024, the Chief Guest, Dr. Raghavendra Tewari, Outstanding Scientist & Director of Materials Group, Bhabha Atomic Research Centre outlined the energy scenario in India and the changing role of critical minerals. The Guest of Honor, Pankaj Kumar, Deputy Director General of the Geological Survey of India, presented a clear geological picture of Odisha to the audience, highlighting the possibility of industrial development, especially related to the critical minerals.



Bhubaneswar Regional Centre of the Indian Institute of Chemical Engineers (IICChE-BRC) and CSIR-Institute of Minerals and Materials Technology (CSIR-IMMT), Bhubaneswar, organized ODICHEM-2024 on the theme “Technological Challenges in the Mineral Sector” on 18-19th October 2024 at ITC Welcomhotel, Bhubaneswar. Around 200 delegates from industries, academia, and R&D organizations attended the seminar. There were many presentations primarily focused on the challenges and opportunities in the mineral sector, with an emphasis on critical minerals, as well as ferrous and non-ferrous minerals.

Prof. Dr.-Ing. Omkar Nath Mohanty, Director, Technology & Academic Initiative, RSB Metaltech., RSB Group, Pune, delivered his keynote address on “Sustainable Steel Production in India an Appraisal: Focus on utilization of solid by-products.” He outlined the challenges of meeting the growing demand for steel production, including securing critical raw materials, sourcing energy and water, optimizing mine operations, and minimizing environmental

impact. Dr. Ramanuj Narayan, Director, CSIR-IMMT, Bhubaneswar, narrated the industry-oriented research activities taken up by the Council of Scientific and Industrial Research (CSIR) and CSIR-IMMT, particularly for the mineral sector.

Recovery of Rare Earths

Dr. R. N. Patra, the former Chairman and Managing Director of Indian Rare Earth Limited, discussed the challenges and issues related to recovering rare earth elements from various components of end-of-life equipment. He also compared this recovery process and the extraction of these elements from mined ore, highlighting the significance of industrial recycling in achieving a net-zero economy. P. K. Misra, Chief Manager (Technical) at Indian Rare Earths Limited, in his talk titled “Rare Earth – A Plethora of Opportunities” provided an overview of the current state of the rare earth industry in India, discussing both the challenges and opportunities present in this niche segment.

Extraction of Lithium

Manasa Prasad Mishra, former Director of P&T at NALCO, and Dr. Shivakumar I. Angadi, Principal Scientist in the Mineral Processing Division of CSIR-IMMT in Bhubaneswar, addressed the challenges associated with extracting lithium from primary sources. Additionally, Dr. Chidambaram Mandan, Vice President and Head of R&D and Quality Control at LOHUM focused on the recovery of lithium from secondary resources. The technological challenges associated with uranium processing and the sustainable recovery of rare earth elements are crucial for minimizing environmental impact. The speaker from UCIL (Uranium Corporation of India Limited), Raja Sinha, highlighted the technological challenges in Uranium Material processing.

Earlier, the Chairman of the Organizing Committee, D. P. Misra, a veteran Chemical Engineer of Odisha and a consultant to many chemical industries, welcomed all the industry leaders, associations, and their members, especially the investors from the mineral sectors, to come and explore Odisha as their next investment destination.

Second Distinguished Lecture Honour

IChE-BRC instituted the first Foundation Day Lecture titled “Er. D. P. Misra Distinguished Oration” in September 2023, to honour the immense contributions of Er. D. P. Misra to the chemical sector over several decades. For 2024, the second distinguished lecture honor in the series was conferred upon Ashwin Shroff. He is the Executive Chairman of Excel Industries Ltd, Mumbai. The event took place during ODICHEM-2024. He is a doyen of the chemical and biotech industries. Shroff is widely recognized for his contributions to the growth of the Indian chemical industry. He received the ICC Lifetime Achievement Award in 2012.

Innovations in Minerals & Mining

Dr. Kali Sanjay is the Chief Scientist and Head of the Hydro and Electrometallurgy Department at CSIR-IMMT in Bhubaneswar, Odisha. He emphasized the importance of nickel and cobalt as strategic opportunities to enhance India’s resource security. Innovations in automation and digitalization are transforming the mining industry. Meanwhile, the primary copper sector in India is adopting cutting-edge technologies to improve efficiency and sustainability. Other speakers included: Dr. Xolisa Camagu Goso, Head of Pyrometallurgy at MINTEK, South Africa, discussed advancements in processing platinum group elements (PGEs), showcasing South Africa’s leadership in this field. Dr. Amit Chatterjee, former Chief R&D Officer at Vedanta Ltd., spoke on innovations in sustainable steel production. Dr. P.K. Banerjee, Outstanding Scientist at CSIR-CIMFR, highlighted the challenges of Indian coal’s high ash content and the need for advanced beneficiation techniques. The global movement towards sustainability and energy security has highlighted a crucial issue. Critical minerals, particularly rare earth elements (REEs) and battery metals, have become vitally important. India, rich in diverse mineral resources, is actively confronting the complex challenge of lithium recovery. However, the challenges include the need for advanced techniques to efficiently extract these valuable minerals. ODICHEM-2024 successfully addressed the technological challenges and opportunities in the mineral sector, focusing on sustainability and advanced extraction technologies. The seminar highlighted the importance of innovative solutions for resource management and environmental responsibility. It emphasized Odisha’s role as a key player in India’s mineral landscape.

Published in:

[Chemindigest](#)

Student-Scientist interaction held at CSIR-CBRI, Roorkee

CSIR-CBRI

28th December , 2024

CSIR-Central Building Research Institute (CBRI), Roorkee, organised a Student-Scientist Interaction Programme under the Jigyasa 2.0 initiative, welcoming around 50 students and 7 teachers from Government Girls' Inter College, Sector-51, Noida. Senior Scientists Dr Hemlata and Dr Chandan Swaroop Meena greeted the students and their teachers, marking the beginning of the educational visit.



As part of the programme, the students explored the Exhibition Gallery, where scientists and coordinators provided insights into various housing technologies developed by CBRI. Dr Chandan highlighted the extensive network of CSIR laboratories across India, emphasising the CSIR-CBRI (Roorkee) expertise in building science and technology.

The visit showcased notable projects such as the construction of the iconic Ram Mandir and the controlled demolition of the Supertech Twin Towers, reflecting modern engineering marvels. Students also learned about CBRI's innovative air purification systems developed during the COVID-19 pandemic and its significant contributions to sustainable housing under the Pradhan Mantri Gramin Awas Yojana (PMAY-G). The programme illuminated the scientific principles behind these technologies and their practical applications, inspiring students to appreciate the impact of research and innovation. The visiting group expressed heartfelt gratitude to CSIR-CBRI, Roorkee, for this enriching and educational experience.

Published in:

[Garhwaldaily.com](https://www.garhwaldaily.com)

New hope for chronic hand eczema patients: Tofacitinib clinical trial shows 90% improvement

CSIR-IGIB

28th December , 2024

In a significant breakthrough for those suffering from chronic hand eczema, a widespread skin condition resistant to existing treatments, a clinical study by RML Hospital has shown a remarkable 90% improvement in symptoms in 12 of 15 patients within just four weeks of using Tofacitinib. The treatment regimen lasted about six months.

According to researchers, the drug was used after studying the signalling pathway in the skin of patients. The condition commonly affects individuals with frequent exposure to detergents and solvents, including those working in vegetable processing, resulting in skin degradation of hands.

The research, conducted by medical professionals at RML, in collaboration with the Council of Scientific and Industrial Research — Institute of Genomics and Integrative Biology (IGIB), Delhi, was published in a recent PubMed publication (Archives of Dermatological Research).

Chronic hand eczema is the most common occupation-related skin disorder, with as many as 40% of workers in high-risk occupations developing this ailment. Dr Kabir Sardana, principal investigator from RML Hospital's dermatology department, noted that the condition significantly affects workers with frequent water exposure, including healthcare professionals, food service staff and hairdressers.

"The condition carries substantial financial implications, encompassing healthcare expenses, disability-related costs, compensation claims, rehabilitation programmes, workplace absenteeism and potential unemployment. Additionally, individuals suffering from acute hand eczema often experience considerable disruption in their social interactions and overall quality of life," said Dr Sardana.

The study assessed the expression of cytokines from Th1 and Th2 cell lineages in tissue samples of chronic hand eczema patients and evaluated the efficacy of oral Tofacitinib. The research focused on patients who did not respond to conventional treatments. The treatment protocol specified Tofacitinib administration at 5mg twice per day, with regular assessments conducted at four-week intervals and follow-up monitoring for any post-treatment recurrence.

Prior therapeutic interventions included topical corticosteroids usage across all participants. While methotrexate proved unsuccessful in 19% of the cases, acitretin showed no benefit in 9.5% of patients.

The study stated that of the 21 participants, 15 received Tofacitinib 5mg twice daily. Within an average period of four weeks, 12 patients achieved a 90% improvement in their hand eczema. Four of these 12 patients experienced adverse effects while three noticed disease reappearance about seven months after discontinuing Tofacitinib.

The findings indicated that Tofacitinib, functioning as a pan-JAK inhibitor, showed significant effectiveness in treating resistant chronic hand eczema cases, where elevated tissue Th1/Th2 cell-related cytokine levels were present.

Research published in Journal of Dermatology indicates that hand eczema affects 10-15% of India's population. A separate study at an Indian tertiary care facility found that hand eczema represented about 20-30% of dermatology outpatient visits.

People affected by the condition primarily experience dryness and itchiness of the skin, accompanied by redness or darkened patches. The affected skin may become painful, develop cracks and occasionally bleed. Some patients might develop fluid-filled blisters. During active flare-ups, the skin typically becomes thick with a scaly texture, while the fingers may exhibit noticeable swelling.

Published in:

[Times of India](#)

New method for detecting H. pylori & its mutations can help dyspeptic patients in resource poor remote settings

CSIR-IGIB

27th December , 2024

Researchers have found a way to develop FELUDA as a point-of-care diagnostic service at a minimal cost for detection of H. pylori and its mutations in dyspeptic patients from rural areas of India, with minimal or no access to diagnostic laboratories. Infections with H. pylori affect over 43 percent of the world's population with a wide range of gastrointestinal disorders, including peptic ulcers, gastritis, dyspepsia and even gastric cancer.

Resistance to clarithromycin, primarily attributed to point mutations in the 23S ribosomal RNA coding gene of H. pylori poses a global threat to public health, by necessitating repeated diagnostic tests and use of multiple courses of different antibiotic combinations for eradication of the same. Therefore, integration of novel diagnostic strategies as cost-effective diagnostic tools to detect the presence of H. pylori in human samples, as well as the identification of the antibiotic susceptibility is crucial for its rapid eradication.

CRISPR-based methodologies are known to enable site recognition and cleavage of the target DNA with exceptional accuracy by designing guide RNAs targeting the respective mutation site in various kinds of DNA samples. Hence, in-depth understanding of H. pylori genetic makeup by CRISPR-based diagnostics (CRISPRDx) could aid in molecular dissection of its pathogenicity and development of targeted therapeutics against different strains.

Towards this goal, Dr. Debojyoti Chakraborty and Dr. Souvik Maiti's group at CSIR-IGIB had previously demonstrated the possibility of detecting H. pylori antibiotic resistance mutations using Cas9-based mutation detection strategies. However, CRISPR-Cas9 based biosensing techniques face limitations due to the requirement of NGG PAM sequences at the recognition site while detecting mutations. To encounter this limitation of CRISPR-Cas9 based detection tools in this study, Dr Shraddha Chakraborty (currently a Department of Science and Technology INSPIRE Faculty Fellow at DBEB, IIT Delhi) and colleagues at

CSIR-IGIB explored the potential of en31-FnCas9 to successfully detect the presence and identify the 23S rDNA mutation status of *H. pylori* in gastric biopsy samples from dyspeptic patients, both by in vitro cleavage studies and lateral flow-based test strip assays (FELUDA). Clinical arm of the study was led by Dr. Govind K. Makharia (Department of Gastroenterology, AIIMS New Delhi), Dr. Manas K. Panigrahi (Department of Gastroenterology, AIIMS Bhubaneswar) and Dr. Vinay K. Hallur (Department of Microbiology, AIIMS Bhubaneswar).

They used an engineered Cas9 protein having resemblance to Cas9 orthologs isolated from *Francisella novicida* (en31-FnCas9) but with altered PAM binding affinity. In their paper published in the *Microchemical Journal* they reported the potential of this en31-FnCas9 to successfully detect the presence and identify the 23S rDNA mutation status of *H. pylori* in gastric biopsy samples from dyspeptic patients of Indian origin.

The study highlights the significance of sequencing-free molecular diagnosis in detecting *H. pylori* and its antibiotic resistance mutations, thereby emphasizing the need for tailored treatment plans to address global public health concerns associated with antibiotic resistance and gastric cancer risks. The integration of en31-FnCas9-based detection with lateral flow assay (FELUDA) demonstrated rapid visual readout of *H. pylori* infection and its mutation status in patient samples, enhancing its diagnostic potential in clinical settings.

This is the first report of en31-FnCas9 mediated molecular diagnosis of *H. pylori* mutations implicated in clarithromycin resistance.

Successful deployment this methodology in a clinical setup can be helpful in providing accurate and timely reports on the antibiotic resistance pattern of the *H. pylori* strains isolated from patients, in remote settings allowing for effective management of this global public health concern.

Published in:

[Pib](#)

CSIR's new technology answer to challenges posed by rugged terrain in constructing border roads

CSIR-CRRI

27th December , 2024

Road construction technology developed by the Council for Scientific and Industrial Research (CSIR) could be the answer for construction of roads in remote, high-altitude areas where inclement weather and rugged terrain pose a huge challenge.

“The indigenous road construction technology, called REJUPAVE, developed by CSIR's Central Road Research Institute (CRRI), to construct high altitude bituminous roads at low and sub-zero temperature conditions was successfully utilised by the Border Road Organization (BRO) for high-altitude bituminous roads construction on China Border in state of Arunachal Pradesh,” the Ministry of Science and Technology stated in its year-end review issued on December 27.

“The technology has also been used by the BRO's project Vijayak in Kargil to construct high-altitude bituminous roads on the Drass-Umbala-Sankoo axis in Drass region of Ladakh,” the year-ender added.

The bio-oil-based REJUPAVE, an acronym for 'Rejuvenator for Recycling of Asphalt Pavement Material for Hot in Plant and Hot in Situ Recycling of Bituminous Pavement', was introduced by CRRI earlier this year.

In a report tabled by Parliament's Standing Committee on Defence earlier this month, the Director General Border Roads (DGBR) was quoted as saying that REJUPAVE is a technology where a mixture is added to the hot mix called bitumen. “The major challenge for us is that from the hot mix plant, by the time the hot mix reaches the road, the temperature is so low that hot mix cannot be laid, and it cracks. So, this allows us to construct in very cold temperatures. We are able to use this in very cold temperatures,” he had said while deposing before the Committee.

In addition, BRO has also started using steel slag, a waste product of the steel industry, as an aggregate in road construction, which combined with bitumen is used as the top surface. “It is extremely interesting that this is better than the stone aggregate that we use. It has better anti-corrosive properties. It does not absorb moisture,” the DGBR had further stated.

REJUPAVE is the first indigenously manufactured asphalt rejuvenator. It eliminates the problem of increasing road levels due to overlay of hot mix asphalt and significantly reduces the energy usage, thus conserving the energy required for production of the hot mix asphalt.

Since it is totally composed of bio-oil, it doesn’t harm the environment in any way and enables the conservation of natural resources by recycling the aggregates and bitumen which would have otherwise been wasted.

The BRO, which is engaged in the construction and maintenance of thousands of kilometers of roads along the Himalayan frontier, has a limited working season of just about six months in a year. Roads remain closed during winters because of heavy snow and work also gets disrupted during the monsoons. Low temperatures and the soil composition in certain areas also adversely affects the laying of roads.

Year-End 2024: CSIR Achieves Breakthroughs In Breast Cancer Detection, Sickle Cell Anaemia And Parkinson's Research

CSIR-CCMB, IMTECH

27th December , 2024

The Council of Scientific and Industrial Research (CSIR) has made significant scientific and research gains in 2024, especially for breast cancer, sickle cell anaemia, and Parkinson's disease in the year 2024, said the Ministry of Science and Technology on Friday.

The CSIR-Centre for Cellular and Molecular Biology (CSIR-CCMB) and Regional Cancer Centre (RCC), Thiruvananthapuram developed a non-invasive blood test for early breast cancer detection. The low-cost method led to the analysis of MicroRNA (miRNA) signatures in hundreds of cancer samples, identifying 439 miRNAs linked to invasive breast cancer, with 107 as potential biomarkers for different types and stages of the disease, the ministry said.

The CSIR-CCMB also launched the first-of-its-kind initiative for the development of the Indian Breast Cancer Genomic Atlas (IBCGA) for India-specific cancer resources. The Atlas is being developed by mapping nearly 1,000 breast cancer tumor genomes across the country. The initiative aims to identify molecular features specific to Indian breast cancer cases, which could enhance clinical management and treatment options.

Researchers at the CSIR-CCMB, Hyderabad developed a rapid test identifying sickle cell anaemia -- a group of inherited blood disorders. The test is an accurate, rapid, and affordable molecular test for screening sickle cell. It uses indigenously developed reagents and is designed to better detect the prevalence of this genetic disease, which affects a significant portion of both the tribal and mainland populations, said the ministry. Further, the CSIR-Institute of Microbial Technology (CSIR-IMTech) discovered a molecule that could lead to the developing of a cure for Parkinson's - - a neurodegenerative disease.

The study, till now only carried out on mice, has shown promising results for one molecule. The researchers have filed an international patent for four molecules that have the potential to

provide a cure for the disease. Headquartered in New Delhi, CSIR is an autonomous body that was established in 1942 under the Department of Scientific and Industrial Research (DSIR), Ministry of Science and Technology.

It is among the largest publicly funded research and development organisations in the world. It has about 37 national laboratories that undertake research spanning myriad fields from oceanography, geophysics, chemicals, drugs, genomics, biotechnology, and nanotechnology to mining, aeronautics, instrumentation, environmental engineering, and information technology.

Besides healthcare, CSIR also initiated research in developing India's first indigenously built Fuel Cell Vessel; a national mission on sustainable packaging solutions; and developing a multi-millet bun in collaboration with McDonald, among others.

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