



# CSIR NEWS

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## What's Inside




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# CSIR-CIMAP Aroma Clusters

## *Empowering Tribal Communities through Science-Led Agriculture*

Across India's tribal heartlands, scientific cultivation of aromatic crops is emerging as a powerful tool for livelihood generation. Led by the CSIR-Central Institute of Medicinal and Aromatic Plants (CSIR-CIMAP) under the CSIR Aroma Mission, the Aroma Cluster approach is transforming underutilised lands into productive assets while creating sustainable income opportunities for tribal farming communities.

Unlike conventional agricultural interventions, the cluster model integrates the entire value chain — from supplying high-quality planting material and improved crop varieties to scientific cultivation practices, distillation technologies, value addition, and market linkages. This end-to-end support enables tribal farmers to participate not merely as cultivators but as stakeholders in the essential oil economy.

The initiative has established aroma clusters in several tribal-dominated regions, including Chhattisgarh, Jharkhand, Odisha, Rajasthan, Madhya Pradesh, Tamil Nadu and the North-Eastern states, where farmers are cultivating high-value crops such as lemongrass, citronella, vetiver, patchouli and palmarosa. These crops are particularly suited to marginal and rain-fed lands, require relatively low inputs, are less vulnerable to extreme weather, and are generally protected from damage by wild and grazing animals — making them an attractive alternative to traditional crops in tribal areas.

Beyond crop diversification, the programme is strengthening rural entrepreneurship. Farmers are trained in nursery development, good cultivation practices, scientific harvesting, improved distillation techniques, and quality management, while the installation of superior distillation units reduces transportation costs and allows communities to capture greater value from essential oil production. The cluster approach has also encouraged participation of women and self-help groups, generating employment across cultivation, processing, and marketing activities.

The impact has been significant. Under the CSIR Aroma Mission, more than 4,500 aroma clusters have been developed across 28 states, including 20 dedicated clusters in tribal areas. These interventions have helped bring over 51,000 hectares under aromatic crops, trained more than 1.22 lakh people, supported 110 entrepreneurs, and generated nearly one crore rural employment opportunities, demonstrating how science-led agriculture can become a catalyst for inclusive economic development.

By connecting tribal farmers with modern technologies, processing infrastructure, and assured value chains, CSIR-CIMAP has demonstrated that aromatic crops can do far more than produce essential oils — they can cultivate resilience, entrepreneurship, and long-term prosperity in some of India's most underserved regions.


1. Anamalai Tiger Reserve
2. Araku Valley
3. Bhojdih
4. Bishunpur
5. Boha
6. Byrwa
7. Chandankiyari
8. Dudhwa Tiger Reserve
9. Jhadol
10. Lothavi
11. Malgaon
12. Marayoor
13. Nabarangpur
14. Peddamandadi
15. Shodag
16. Tamulpur
17. Tunju
18. Umkrem
19. Amarkantak
20. Majuli (Jengraimukh Village)

**Pan-India Aroma Clusters in Tribal Regions**

*Contributed by* Science Communication and Dissemination Directorate (SCDD), CSIR, New Delhi.
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# Hon'ble President of India, Smt. Droupadi Murmu Confers the Prestigious Padma Shri to Kumarasamy Thangaraj


At the Civil Investiture Ceremony-II, Rashtrapati Bhavan, Hon'ble President of India, Smt. Droupadi Murmu, awarded Dr Kumarasamy Thangaraj the Padma Shri, on 23 June 2026. Dr Thangaraj, a distinguished geneticist, is a CSIR Bhatnagar Fellow at the CSIR-Centre for Cellular and Molecular Biology (CSIR-CCMB) in Hyderabad.

Over a career spanning more than three decades at CSIR-CCMB, Dr Thangaraj has uncovered details of the ancestry and migrations of various Indian populations. In a country like India, where people from different regions look and live very differently from each other, many wonder about the sources of this diversity. Dr Thangaraj's work has been seminal in understanding the

formation of this diverse population in India as well as in the larger sub-continent. Through his detailed genetic analyses, he has identified unique genetic signatures in different populations and traced them in other populations across the sub-continent. Finding common signatures between populations means they are related to each other. Such studies have explained the ancestry of the Sindhi, Coorgi, Ladakhi, and Nicobarese populations, as well as demystified ancient folklore of the Roopkund lake and the Muziris port city. These studies have highlighted how people from Africa, Europe, and different parts of Asia have been coming and integrating into the Indian subcontinent for centuries, leading to various physical and cultural attributes among the people here.

Dr Thangaraj has also identified unique disease-causing genetic mutations across different Indian sub-populations, a result of endogamy. He has been a strong advocate for genetic testing for rare genetic diseases in the country. He also led the Genome India initiative by the Department of Biotechnology, Government of India. This initiative has set the stage for India to document the genetic profiles of all its populations — a must in the pursuit of personalised medicine in the country.

"It is a matter of immense honour for CSIR-CCMB to facilitate Dr Thangaraj's illustrious work. His work has, indeed, helped the country understand its history and envision future healthcare for its people," remarked Dr Vinay K Nandicoori, Director, CSIR-CCMB.

# Hon'ble Union Minister Dr Jitendra Singh dedicates to the nation first-of-its-kind "Eco-Educational Hub"

Union Minister of State (Independent Charge) for Science & Technology and Earth Sciences, and Minister of State in the Prime Minister's Office, Personnel, Public Grievances, Pensions, Atomic Energy and Space, and Vice-President, CSIR, Dr Jitendra Singh on 8 August 2026, called for taking the work of scientific institutions closer to society by systematically

showcasing their technologies, success stories and societal applications, while dedicating to the nation, the first-of-its-kind CSIR-National Botanical Research Institute (CSIR-NBRI) "Eco-Educational Hub" "Prakriti Gyan Dham" at the Maharishi Parashar Bioresource Centre (MPBC), Banthra, Lucknow.

Dr Jitendra Singh said the outreach of scientific institutions should go beyond laboratories and institutional campuses, with greater use of digital and social media platforms to showcase successful technologies and initiatives so that farmers, entrepreneurs, students, industry and other stakeholders are able to access scientific solutions and opportunities for livelihood generation. He also called for greater integration of similar and complementary projects across Departments and Ministries, enabling institutions to work together and maximise the societal impact of scientific research and innovation.

The programme was attended by Dr GN Singh, Advisor (Health) to the Chief Minister of Uttar Pradesh; Dr Ajit Kumar Shasany, Vice-Chancellor, Central University of Odisha; Dr Zabeer Ahmed, Director, CSIR-NBRI and CSIR-IIIM Jammu; senior scientists, researchers, farmer beneficiaries of the CSIR Floriculture Mission and other invited guests.

The Eco-Educational Hub represents a convergence of scientific research, environmental education, biodiversity conservation, botanical heritage and cultural interpretation. Developed as a first-of-its-kind eco-educational facility, it has been conceived as a living repository of India's rich botanical and cultural legacy, offering an immersive environment for students, researchers, educators, nature enthusiasts and the general public.

The Hub provides a direct interface between scientific knowledge and public engagement, with its different facilities designed to make India's plant diversity, conservation efforts and botanical heritage accessible through experiential and interactive learning. Dr Jitendra Singh said such initiatives can help strengthen the connection between scientific institutions and society while creating greater awareness of the practical value of scientific knowledge.

A defining feature of the Hub is PAaVan Path (Plants and Associated Vegetations for Appreciating Nature), an interpretive heritage trail that forms the central experiential component of the campus. The trail takes visitors through curated plant collections representing diverse ecological regions and associated vegetation.

At the heart of the Hub is the Indian Heritage Garden, which brings together heritage trees propagated from historically significant locations across the country. The garden includes the Bawan Imli Tamarind Tree from Fatehpur, associated with the sacrifice of 52 freedom fighters; the Mother Dussehri Mango Tree from Lucknow; the Patalpuri Banyan of Prayagraj; the Mango Tree planted by Mahatma Gandhi at Bhitiharwa, Champaran; and descendants of trees associated with the historic Dandi March route in Gujarat.

The garden also uses QR-enabled audio systems to provide visitors with historical, cultural and botanical information about the heritage trees through their smartphones, converting the landscape into an interactive learning space.

The Vibhav Enclave — Threatened Plants of India Garden provides a dedicated space for rare, endangered and threatened plant species and promotes awareness about biodiversity loss, habitat degradation, climate change and the need to conserve plant genetic resources. The Bhairav Enclave — State Plants of India Garden brings together officially designated State Plants of States and Union Territories, presenting their ecological, cultural and symbolic significance.

Another major attraction is the Bamboosteum, which houses 43 indigenous and exotic bamboo species. The facility demonstrates the importance of bamboo as a renewable bioresource with applications in ecological restoration, carbon sequestration, soil conservation, sustainable livelihoods, traditional craftsmanship and green infrastructure.

The Hub's science-to-society orientation was also reflected in the technologies and products launched and transferred during the programme. An herbal formulation for male reproductive health, developed in collaboration with Himalaya, was


formally launched. Four plant-based technologies, Herbal Anti-Dandruff Hair Care Oil, Frotus: Lotus-inspired Perfume, Frotus: Rudra Perfume and Herbal Nano Serum, were transferred to the Kudumbashree State Poverty Eradication Mission, Kerala, with the objective of promoting women-led entrepreneurship and livelihood generation through science-based value-added products.

Further strengthening industry-academia collaboration, CSIR-NBRI transferred the Design and Development of a Low-Cost Photobioreactor technology to Witwake Solutions Pvt. Ltd, Lucknow. The transfer demonstrates how research developed within a scientific institution can be taken forward for wider technological and industrial applications.

Dr Jitendra Singh also called for scientific institutions to make greater use of their success stories and technological achievements for public outreach, not merely as a communication exercise but as a means of making potential users and stakeholders aware of solutions that can contribute to livelihoods and economic opportunities. The technology transfers at the programme provided a practical example of this approach, connecting institutional research with entrepreneurship, industry and livelihood generation.

He also stressed the importance of integrated work across Departments, Ministries and institutions wherever projects and objectives are aligned. Such collaboration, he said, can help bring together complementary scientific capabilities and ensure that successful initiatives have a wider reach and impact.

The Minister also appreciated CSIR-NBRI's contribution towards translating plant science research into technologies and products for farmers, industry and the general public, and emphasised the continued need to combine traditional knowledge with modern technologies to address emerging environmental and climate challenges.

During the programme, Dr Jitendra Singh released a documentary showcasing India's Heritage Gardens, presenting the country's botanical wealth and the cultural, historical and ecological significance associated with its plant diversity.

Earlier, welcoming the Chief Guest and dignitaries, Dr Zabeer Ahmed, Director, CSIR-NBRI and CSIR-IIIM Jammu, spoke about the institute's contributions in plant science research, conservation and technology development. He said the Eco-Educational Hub has been conceived as a living repository of India's botanical diversity,

enabling visitors to engage with the country's plant heritage through interactive and immersive learning.

The Eco-Educational Hub at MPBC, Banthra Campus is envisaged as a national destination for experiential learning and public engagement, bringing together botanical diversity, conservation, heritage and scientific outreach. Through its combination of living collections, heritage trails, digital interpretation and technology-oriented initiatives, the Hub seeks to foster a deeper connection between people and nature while strengthening the interface between scientific institutions and society.

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*Source: PIB*

# North India's First Biotech Park at Kathua, A Hub of Biotech Driven Entrepreneurship in the Region: Dr Jitendra Singh


Union Minister and Vice President, CSIR, Dr Jitendra Singh, on 01 August 2026, said that the Industrial Biotech Park (IBP) at Ghatti, Kathua, will emerge as a major hub for biotechnology-driven innovation, startup incubation, research, entrepreneurship and industrial development, creating new opportunities for youth, scientists, farmers and industry across Jammu & Kashmir and North India. Dr Jitendra Singh was addressing the gathering as the Chief Guest during the signing of an MoU between CSIR-Indian Institute of Integrative Medicine (CSIR-IIIM), Jammu and the Jammu & Kashmir Science, Technology & Innovation Council (JKST&IC) for the operationalisation and management of the Industrial Biotech Park at Ghatti, Kathua. Congratulating CSIR-IIIM, the Department of Science and Technology, Government of Jammu & Kashmir, and all stakeholders associated with the initiative, Dr Jitendra Singh described the project as another milestone in Kathua's development

journey. He said the Biotech Park is not merely an infrastructure project but a platform to generate opportunities for scientists, researchers, startups, entrepreneurs, farmers, industry and the youth.

Highlighting the transformation of India's innovation ecosystem under the leadership of Hon'ble Prime Minister Shri Narendra Modi, Dr Jitendra Singh said the vision of the Government is to create job creators rather than job seekers. Referring to flagship initiatives such as Startup India, he said India has witnessed an unprecedented startup revolution since 2014, with the number of recognised startups growing from only a few hundred to more than two lakh, reflecting a fundamental shift in the aspirations and entrepreneurial mindset of India's youth. He said Jammu & Kashmir possesses immense strengths in biodiversity, medicinal and aromatic plants, agriculture, horticulture, floriculture and other bio-resources, which can be transformed into high-value products through scientific research, biotechnology and innovation. He emphasised that these natural resources represent enormous economic opportunities capable of generating sustainable livelihoods and strengthening the region's bioeconomy. Describing the Industrial Biotech Park as a transformative initiative, Dr Jitendra Singh said it will provide a common platform where scientists, researchers, startups, entrepreneurs, industries and farmers can collaborate under one roof. He stressed that scientific research should not remain confined to laboratories or publications but should be translated into commercially viable technologies, products and enterprises that directly benefit society.

Recalling the success of the CSIR Aroma Mission and the Purple Revolution, Dr Jitendra Singh said lavender cultivation has transformed the lives of farmers in Jammu & Kashmir by converting traditional agriculture into profitable entrepreneurship. He noted that the success of lavender has demonstrated how scientific interventions, value addition and market linkages can generate employment, enhance farmers' incomes and establish sustainable bio-based enterprises. He said similar opportunities exist in medicinal plants, aromatic crops, floriculture and other biotechnology-based sectors. The Union Minister said the Industrial Biotech Park should become a centre where innovative ideas are converted into successful enterprises. It will promote biotechnology startups, agri-entrepreneurship, technology incubation and commercialisation while encouraging young innovators and researchers to develop solutions that directly address societal needs. Explaining the key ingredients of a successful innovation ecosystem, Dr Jitendra Singh said sustainable innovation rests on four essential pillars — ideas from the young, experience from the elders, support from the Government and investment from industry. He said meaningful innovation can flourish only when these four components work together in harmony. He said the Government will continue to provide enabling policies, infrastructure and institutional support, while scientific institutions will generate knowledge and technology, industry will commercialise innovations and young entrepreneurs will convert ideas into successful enterprises. Such partnerships, he said, form the foundation of sustainable economic development.

Describing the MoU as much more than a formal agreement, Dr Jitendra Singh said it represents the Government's commitment to an integrated and collaborative approach where scientific institutions, academia, industry and government departments work together rather than in isolation. The collaboration, he said, will strengthen research, accelerate technology transfer, promote entrepreneurship and create a vibrant biotechnology ecosystem in the region. Referring to Prime Minister Narendra Modi's vision of a "Whole-of-Government" approach, Dr Jitendra Singh said coordinated efforts among all stakeholders are essential for achieving national development goals. He said the Industrial Biotech Park embodies this philosophy by bringing together research institutions, government agencies, startups, industry and farmers on a common platform. Expressing confidence in the future of the project, Dr Jitendra Singh said the Industrial Biotech Park will emerge as one of North India's leading centres for biotechnology innovation. It will


strengthen research, promote commercialisation of indigenous technologies, encourage startup culture, create employment opportunities and contribute significantly to the knowledge-based economy of Jammu & Kashmir. The Union Minister said the objective is not merely to conduct scientific research but to transform knowledge into economic growth and societal benefit. Scientific innovation, he said, must improve people's lives, strengthen India's bioeconomy and generate sustainable livelihoods through technology-driven entrepreneurship.

Referring to Prime Minister Shri Narendra Modi's vision of Viksit Bharat 2047, Dr Jitendra Singh said Jammu & Kashmir has the potential to become a major contributor to India's journey towards becoming a developed nation. He said the Union Territory's rich biodiversity, scientific institutions, skilled youth, medicinal and aromatic plant resources, and growing innovation ecosystem place it in a unique position to drive biotechnology-led growth and contribute significantly to the country's economic transformation. Congratulating CSIR-IIIM, JKST&IC and all stakeholders associated with the initiative, Dr Jitendra Singh expressed confidence that the Industrial Biotech Park at Ghatti, Kathua, will create many more success stories in the years ahead by empowering researchers, startups, farmers and entrepreneurs while establishing Jammu & Kashmir as a leading biotechnology and innovation hub in the country.

Earlier in his welcome address, Dr Zabeer Ahmed, Director, CSIR-IIIM Jammu, apprised the Union Minister about the various milestones in the setting up of the Industrial Biotech Park and the future plan to meet the objectives of this high-end facility. He said that the MoU being signed represents a significant milestone in strengthening biotechnology innovation and entrepreneurship in the region. He expressed his gratitude to Union Minister Dr Jitendra Singh for his continuous mentorship and support in setting up the Industrial Biotech Park to strengthen the scientific institutions and create new opportunities for biotechnology-based growth in Jammu and Kashmir. He said the Industrial Biotech Park at Ghatti, Kathua, established by CSIR-IIIM with support from the J&K Science & Technology Department and the Department of Biotechnology, Government of India, is the first Industrial Biotech Park in North India. Dr Zabeer Ahmed said the park has been developed as a comprehensive platform for incubating innovative ideas and supporting startups, agri-entrepreneurs, scientists, scholars and students through state-of-the-art research, incubation and technology development facilities. He informed that the facility houses advanced infrastructure including herbal extraction units, fermentation facilities, analytical laboratories, distillation facilities, micropropagation and plant tissue culture laboratories, besides provisions for technology incubation, training and skill development.

Dr Ahmed said the Industrial Biotech Park has identified Agriculture Biotechnology, Healthcare Biotechnology, Nutraceuticals and Botanical Extracts, and Process Biotechnology as its priority thrust areas to promote innovation, technology development and entrepreneurship. He said the park will support activities in micropropagation, biofertilisers, biopesticides, animal healthcare, drug discovery, medicinal and aromatic plant extracts, nutraceutical development, enzymes and other value-added biomolecules, creating opportunities for research, commercialisation and industry collaboration. He further said the Biotech Park will undertake research on the rich biodiversity, medicinal and aromatic plant resources of Jammu & Kashmir and Ladakh while promoting green technologies, sustainable biotechnology solutions and bio-based industries. Dr Ahmed informed that the BIRAC BioNEST Incubator has already been established at the Biotech Park, Kathua, and is presently supporting 15 startups working in diverse areas of biotechnology, providing incubation support, mentoring and access to scientific infrastructure. He added that CSIR-IIIM is also conducting job-oriented skill development programmes at the facility to enhance the employability, entrepreneurial capabilities and technical skills of youth, thereby contributing to the growth of the biotechnology ecosystem in the region. Dr Ahmed said that while the Industrial Biotech Park infrastructure has already been established and the BIRAC BioNEST Incubator is functioning successfully, the MoU signed today marks the beginning of its full-scale operationalisation and management through CSIR-IIIM as the Project Management Unit (PMU).

Commissioner/Secretary, Science & Technology Department, Babila Rakwal, while speaking on the occasion, said that as per the agreement, CSIR-IIIM Jammu will function as the Project Management Unit (PMU) for the Biotech Park and provide scientific, technical, operational, administrative and governance support for effective functioning of the facility. She informed that the Industrial Biotechnology Parks Society and JKST&IC will provide financial support of ₹15 crore for a period of three years to CSIR-IIIM Jammu for execution of the project. In the campus of IBTP, Kathua, a Bio Farm is also being set up which would be a demonstration centre of high-value medicinal, Aromatic and flowering plants, she added. She said that as partner in the project, CSIR-IIIM will oversee the planning, execution and monitoring of activities at the Industrial Biotech Park, manage scientific infrastructure, support innovation and incubation programmes, organise capacity-building initiatives and strengthen collaboration with industries and research institutions. The partnership is expected to position the Industrial Biotech Park as a key centre for biotechnology-led scientific and industrial development in Jammu and Kashmir, creating opportunities for technology transfer, startup growth and innovation-driven entrepreneurship.

Addressing the gathering, MLA Jasrota, Rajiv Jasrotia, described the Industrial Biotech Park as a project of national significance and said it would emerge as a transformative institution for the region. He said the park would directly benefit local youth, farmers, startups and aspiring entrepreneurs by creating new opportunities for innovation, skill development and biotechnology-based enterprises. Emphasising that development is a continuous process, he said the initiative reflects the commitment of the people's representatives towards inclusive growth and regional progress. He also appreciated the leadership and continued support of Union Minister Dr Jitendra Singh in strengthening scientific infrastructure and expressed confidence that the Biotech Park would benefit not only Jammu & Kashmir but the entire country.

The event was attended by Deputy Commissioner, Kathua, Rajesh Sharma (JKAS); Principal, Government Medical College, Kathua, Dr Surinder Kumar Atri; Senior Superintendent of Police, Kathua, Mohita Sharma, IPS, along with the senior officers from CSIR-IIIM, JKST&IC, government departments, scientists, researchers, members of civil society, entrepreneurs and students.

# Science is for Society, and its Outputs should Reach the Masses: Dr Jitendra Singh


The Hon'ble Union Minister of State (Independent Charge) of Science & Technology and Earth Sciences, and Vice President, CSIR, Dr Jitendra Singh, visited the CSIR-Institute of Himalayan Bioresource Technology, Palampur on 28 May 2026 to review its progress. Dr N Kalaiselvi, Director General, CSIR and Secretary, DSIR, was also present on the occasion.

Dr Sudesh Kumar Yadav, Director, CSIR-IHBT, welcomed the dignitaries and the guests. He apprised the work and activities being carried out by the institute and briefed about the Aroma and Floriculture Missions and how they are leading to the improvement of the local economy and ecology.

Speaking on the occasion, Dr N Kalaiselvi emphasised the recent initiatives and technological achievements of the CSIR. She also highlighted the role of CSIR-IHBT in boosting the bioeconomy through high-end science. Dr Kalaiselvi lauded the contributions of the institute and wished it grand success in its upcoming endeavours.

In his presidential address, Dr Jitendra Singh complimented the institute on its scientific pursuits. He admired the institute for its path-breaking work on Stevia and Tulip and in the promotion of start-ups. He highlighted that the institute has the potential to be the torchbearer of the Himalayan Economy and should strive towards it with an ultimate aim of Viksit Bharat. The Hon'ble Minister emphasised that science is for society and its outputs should reach the masses. On the occasion, the Hon'ble Minister visited the exhibition showcasing products based on technologies developed by the institute. For awareness, the Hon'ble Minister took photographs at the Selfie point of the institute and participated in the efforts being made by the institute towards indigenous Hing production.

During the programme, signing of technology transfer agreements with M/s Chandigarh Sweets Limited, Mohali; E-Hemp Stores Pvt. Ltd, New Delhi; Praarabdh Society, Mandi, Himachal Pradesh; M/s Kannav Biocreations Pvt. Ltd, Una, Himachal Pradesh; M/s Krishi Rasayan Pvt. Ltd, Kolkata; and Parwaaz Organics, Jalandhar, Punjab were done. One MoU was also signed with Himalayan Women, Awareness & Livelihood (HIMWAL) Society, Dehradun, Uttarakhand.

# CSIR Celebrates Women Researchers in STEM at ASPIRE-SHAKTI

*CSIR-ASPIRE Compendium Released, Next Phase of the Scheme to Focus on Inclusion, Innovation and Technology Translation.*


The Council of Scientific & Industrial Research (CSIR), through its Human Resource Development Group (CSIR-HRDG), organised "ASPIRE-SHAKTI: Celebrating Women in STEM & Initiating Project Review Sessions" at the CSIR Headquarters, Anusandhan Bhawan, New Delhi on 13 July 2026. The function brought together Principal Investigators (PIs) of the CSIR-ASPIRE scheme, research fellows and members of the ASPIRE Subject Area Committees from across the country.

Dr N Kalaiselvi, Secretary, Department of Scientific & Industrial Research (DSIR) and Director General, CSIR, presided over the function and released the ASPIRE-SHAKTI Compendium, a documented record of the scheme's research accomplishments.

In her Presidential address, Dr Kalaiselvi recalled the inception of the CSIR-ASPIRE Research Scheme, acknowledging that the idea of launching a research programme exclusively for the women researchers of the country was envisioned by Dr Jitendra Singh, Hon'ble Union Minister of Science & Technology, and implemented by CSIR-HRDG with its launch on International Women's Day 2023.

The DG, CSIR, expressed satisfaction with the overwhelming response from women researchers across the country. However, the DG expressed concern about the comparatively low participation from the North-East region and Ladakh, and emphasised the need for targeted outreach and awareness initiatives, including broader participation by universities and colleges in Tier-2 and Tier-3 cities, to make future calls more inclusive of India's demographics.

Sharing her vision for the scheme's next phase, the DG, CSIR noted that around 20-30 outstanding ASPIRE projects might be identified and supported beyond research by facilitating the commercialisation of their innovations. Dr Kalaiselvi further stated that CSIR would help connect promising ASPIRE researchers with relevant start-ups and innovation partners, enabling the translation of their research outcomes into market-ready technologies.

The DG, CSIR, conveyed her appreciation to the ASPIRE Research Committee members for their

dedicated efforts in the evaluation and selection process, and to CSIR-HRDG for conceptualising, implementing, and successfully conducting the CSIR-ASPIRE Scheme and the ASPIRE-SHAKTI event.

The CSIR-ASPIRE scheme has recorded an exceptional national footprint since its launch. Against 2,878 project proposals received from 969 institutions spanning almost every State, 301 meritorious women researchers have been competitively selected and funded as independent Principal Investigators — a selection ratio of about 10 per cent — across Life Sciences (152), Engineering Sciences (54), Inter/Transdisciplinary Sciences (37), Chemical Sciences (34) and Physical Sciences (25). The projects have so far yielded more than 253 publications in SCI-indexed journals, over 15 patent filings, and 20+ presentations at international conferences, as well as training over 300 research fellows — JRFs, SRFs, and Research Associates — thereby building a specialised pipeline of women scholars for advanced scientific careers.

Earlier, Dr R Parthasarathi, Head, CSIR-HRDG, in his welcome address, traced the Group's eight-decade legacy of building India's scientific human capital — from the research fellowships written into CSIR's founding resolution to the Capacity Building and Human Resource Development (CBHRD) umbrella approved by the Cabinet chaired by Honourable Prime Minister in September 2025 and situated ASPIRE as a named instrument of that continuum. Dr Shweta Pant, Nodal Officer of the ASPIRE scheme, presented the scheme's highlights and insights. Dr Annapurni Subramaniam, Director, Indian Institute of Astrophysics, Bengaluru and Chairperson, ASPIRE Physical Sciences Committee, and Prof. Sharmila A Bapat, Savitribai Phule Pune University and Chairperson, ASPIRE Life Sciences Committee, shared their remarks and acknowledged the rigour of the peer-evaluation process.

The celebration was followed by the initiation of the Project Review Sessions, in which the ASPIRE Subject Area Committees will assess the mid-term progress of the funded projects and guide their translational trajectories.

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*Source: PIB*

R&D

# CCMB Scientists Decode "Sticky" Molecular Traps Used by Plants to Arrest Viral Infections

Researchers at the CSIR-Centre for Cellular and Molecular Biology (CSIR-CCMB) have revealed a key plant defence system in plants. Plants are known to use liquid-like, sticky protein droplets to trap and disable invading viruses. Their study, led by Dr Mandar V Deshmukh and published in the *Journal of the American Chemical Society* (JACS), provides a molecular-level mechanism for this process.

Many viruses contain double-stranded RNA as their genetic material. Plants make certain proteins more when they are infected by viruses, which can identify the viral RNAs. They are called RNA-binding proteins. Some of them can bind to the virus's genetic machinery at positions called the Viral Replication Complexes and stall the genetic machinery from dividing. Unable to divide its genetic material, a virus fails to replicate itself in infected cells. However, the details of the proteins binding to the RNA remained a mystery.

Traditionally, RNA-binding proteins have been assumed to latch onto double-stranded RNA, simply like a key fits into a lock. However, using advanced techniques such as Nuclear Magnetic Resonance (NMR) spectroscopy, fluorescence microscopy, and molecular dynamics simulations, the CCMB group found more to these lock-and-key structures. They discovered a unique fold in double-stranded RNA-binding proteins. In this fold, electric charges are distributed on the surface of the proteins such that they create sticky patches. Positive electric charges attract negative charges. These charges are distributed across the proteins, attracting and binding them to one another. This interconnected mesh of proteins forms dense, gel-like droplets.

"These proteins act like a molecular glue", says Dr Jaydeep Paul, first author of the study. "By forming these dense, gel-like droplets, the plant cells effectively trap the viral RNA, preventing it from interacting with the machinery needed for replication."

These droplets, also known as biomolecular condensates, represent a shift in how scientists understand a living cell. "Rather than a collection


**Team involved in the study led by Dr Mandar Deshmukh (at the rightmost)**

of static membrane-bound compartments like the nucleus and mitochondria, the cell is now seen as a dynamic environment in which membraneless organelles form like oil droplets in water. Understanding these states has significant implications for both basic science as well as translations in agricultural and medical biotechnology," said Dr Deshmukh.

For agriculture, this discovery opens new avenues for developing crop varieties with enhanced natural immunity. By mimicking or strengthening these protein-based traps, scientists can design plants that are more resilient to devastating viral outbreaks that cause billions of dollars in crop losses globally. In human cells, the study opens up the possibility for scientists to manipulate these sticky protein patches, to dissolve neurotoxic clumps associated with dementia or dismantle liquid barriers that protect growing tumours. Moreover, a thorough understanding of these molecular mechanisms would allow scientists to design drugs that precisely manipulate the sticky protein patches.

## MoUs/AGREEMENTS

# CSIR-CEERI Joins Hands with AMTZ to Accelerate Medical Technology for Batch Processing, Certification, Validation and Commercialisation

In a significant step toward strengthening India's medical technology innovation ecosystem, CSIR-Central Electronics Engineering Research Institute (CSIR-CEERI), in collaboration with other CSIR laboratories including CSIR-Central Mechanical Engineering Research Institute


(CSIR-CMERI), CSIR-Advanced Materials and Processes Research Institute (CSIR-AMPRI), CSIR-Central Leather Research Institute (CSIR-CLRI), and CSIR-National Institute of Science Communication and Policy Research (CSIR-NIScPR), participated in the programme for signing of a MoU between the Council of Scientific and Industrial Research (CSIR) and Andhra Pradesh MedTech Zone (AMTZ), Vishakhapatanam, Andhra Pradesh, on 29 May 2026.

The partnership aims to create a robust framework for translating innovative research outcomes into commercially viable Assistive, Rehabilitative and Healthcare technologies. Under this collaboration, AMTZ will provide comprehensive support to CSIR projects, including those undertaken through the ICMR-CAR programme, as well as intramural and extramural research initiatives. The support will encompass prototype development, batch processing, testing and certification, regulatory validation, licensing assistance, and engagement with manufacturing ecosystems.

This strategic collaboration is expected to significantly enhance the technology readiness and commercialisation potential of healthcare innovations developed across CSIR laboratories. By leveraging AMTZ's world-class medical technology infrastructure and industry network, the partnership will facilitate faster deployment of indigenous Medical Devices, Assistive and Rehabilitative technologies for societal and industrial benefit.

The MoU signing ceremony was held at AMTZ, Visakhapatnam, in the presence of Dr Jitendra Sharma, CMD, AMTZ, Mr Amit Sharma, Head, Assistive Technology, AMTZ, along with senior members of the AMTZ team, and Dr Bhausaheb Ashok Botre, Scientist F, CSIR-CEERI, Pilani. The collaboration marks an important milestone in fostering innovation-driven healthcare solutions and strengthening the journey from laboratory research to market-ready products.

## TRAINING PROGRAMMES

# CSIR-NIScPR Successfully Concludes Five-Day Skill Training Programme on AI-enabled Institutional Repositories using DSpace

The CSIR-National Institute of Science Communication and Policy Research (CSIR-NIScPR), New Delhi, successfully concluded a five-day offline Skill Training Programme on "Design, Development and Use of AI in Institutional Repositories using DSpace" from


6–10 July 2026 under the CSIR Integrated Skill Initiative (Phase III). The programme aimed to strengthen the technical competencies of library and information professionals, academicians, researchers, students, and IT professionals in developing and managing institutional repositories using the open-source DSpace platform integrated with emerging Artificial Intelligence (AI) technologies.

A total of 25 participants from universities, research institutions, libraries, and other organisations across the country successfully completed the intensive training programme.

The inaugural session was graced by Dr Geeta Vani Rayasam, Director, CSIR-NIScPR, who encouraged participants to actively engage in the programme and emphasised the growing significance of digital repositories, open-source technologies, and Artificial Intelligence in advancing scholarly communication, knowledge preservation, and research visibility. Ms Meetali Bharti, Programme Coordinator & Nodal PI, introduced the objectives of the programme and highlighted the importance of continuous capacity building in digital knowledge management.

Designed with a strong emphasis on experiential learning, the programme combined expert lectures with extensive hands-on sessions. Throughout the five days, Mr Mukesh A Pund, Head, Training Division and Course Coordinator, conducted the academic sessions, guiding participants through the complete lifecycle of developing and managing institutional repositories using DSpace. The training covered Open Source Software fundamentals, DSpace architecture and administration, communities and collections, item submission, e-People registration and authorisation, Linux and DSpace installation, Dublin Core and Bitstream Registry management, repository customisation, backup and restoration, as well as the application of Artificial Intelligence in libraries, including AI-powered metadata extraction and semantic search. Participants gained practical exposure through demonstrations, guided exercises, and laboratory-based sessions, enabling them to independently deploy, customise, and administer institutional repositories.

Beyond the classroom sessions, participants experienced the broader scientific ecosystem of CSIR-NIScPR through interactions with institute scientists, a visit to the NIScPR Herbarium, and an informative lecture on SARAL AI, providing valuable insights into the Institute's multidisciplinary research and science communication initiatives.

The programme witnessed exceptional enthusiasm and active participation throughout its duration. Interactive discussions, practical problem-solving exercises, and continuous engagement between participants and faculty created a collaborative learning environment that significantly enhanced the overall training experience. The programme successfully equipped participants with the knowledge and practical skills required to establish, manage, and strengthen AI-enabled institutional repositories, thereby supporting open

access, long-term digital preservation, and efficient knowledge dissemination.

The valedictory session was graced by Mr Subhash Chandra Antil, Controller of Administration, CSIR-NIScPR, and Ms Gurmeet Kaur, Finance and Accounts Officer, CSIR-NIScPR, who congratulated the participants on successfully completing the programme and encouraged them to apply the acquired knowledge and technical skills in their respective institutions. Certificates were distributed to all successful participants in recognition of their active participation and successful completion of the training.

Speaking on the occasion, the organisers reiterated CSIR-NIScPR's commitment to strengthening national capacity in digital knowledge management through high-quality skill development programmes under the CSIR Integrated Skill Initiative. The successful completion of this training programme marks another significant step towards promoting the adoption of open-source repository technologies and Artificial Intelligence for modern library and information services, thereby contributing to India's evolving digital research and knowledge ecosystem.

## EVENTS

# 44th Foundation Day Celebrations of CSIR-IHBT

The CSIR-Institute of Himalayan Bioresource Technology (CSIR-IHBT), Palampur, celebrated its 44th foundation day on 2 July 2025 with great enthusiasm.

Dr Sudesh Kumar Yadav, Director, CSIR-IHBT, extended a warm welcome to all the guests and presented the activities of the institute. He highlighted the research being carried out in the institute and how it is furthering the cause of bioeconomy, especially in the Himalayan region. He presented the various CSIR Missions, including floriculture, aroma, smart village, bioresource conservation and prospection, etc., that are strengthening rural livelihood and at the same time catering to the environment and industry.

Dr S Venkat Mohan, Director, CSIR-NEERI, was the Guest of Honour and the keynote speaker of the programme. He complimented the institute on its glorious journey and presented on key issues governing environmental sustainability. He talked about the changing climatic conditions, pollution, disasters and their overall impact. He highlighted the importance of the circular economy and waste management for sustainability. Dr Mohan noted that the work being carried out by CSIR-IHBT has positive environmental implications and is of utmost importance. He wished the institute the very best in its endeavours.

Dr Madhu Dixit, National Scientist Chair (ANRF) and former Director, CSIR-CDRI, was the Chief Guest of the function. She congratulated the institute on its foundation day and lauded the institute's efforts towards the promotion of a bio-based economy, which is directly serving society. She dwelled on the changing ecosystem of research and the various possibilities that are now opening up, especially in the field of herbal medicine and drugs. She emphasised exploring the untapped Himalayan bioresources and the rich traditional knowledge available with the communities of the region.

The occasion saw the release of the Annual Report 2025-26 of the CSIR-IHBT. Appreciation awards for best scientific work conducted during the year were also presented on the occasion.

The institute signed six Transfer of Technology agreements and two Memoranda of Understanding. Further, a variety of Clary sage named Him sage was released and planting material of aromatic marigold distributed to the progressive farmers. Scientists, students, farmers, educationists, industrialists, and other dignitaries attended the foundation day celebrations. Students and faculty members of the PM Shri Kendriya Vidyalaya, Palampur also attended the programme as a part of JIGYASA initiative.

# CSIR-NCL Inaugurates Revamped, State-of-the-Art Skill Development Centre in Pune

CSIR–National Chemical Laboratory (CSIR-NCL), Pune, officially inaugurated its newly renovated, state-of-the-art Skill Development Centre on 30 June 2026. The advanced facility was inaugurated by Dr Ashish Lele, Director of CSIR-NCL, alongside Chief Guest Dr Vinay Kumar, Nodal Scientist for the CSIR-Integrated Skill Initiative (CSIR-HRDC, Ghaziabad), and representatives from the Envalior Team, who sponsored the modernisation project through

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their Corporate Social Responsibility (CSR) initiative. Other key dignitaries present on the occasion included Dr Rajesh Gonnade, NCL Skill Nodal Officer, and Mrs Kanika Goel, Controller of Administration, NCL.

The vision of CSIR-NCL through its Skill Development Program, under the CSIR's Integrated Skill Initiative (CSIR ISI), is to provide world-class high-end skilling in the national skill ecosystem with an aim to create a high-quality skilled workforce relevant to the current and emerging industry needs in the core competency area of the laboratory. SDP activities are carried out through NCL's highly experienced scientific staff and state-of-the-art infrastructure.

The upgraded facility is structured as a dedicated, fully integrated centre designed to centralise and advance all skill development and technical training initiatives at NCL. The modernised infrastructure boasts high-tech amenities, including ultra-modern classrooms equipped with interactive smart displays, a digital podium, a dedicated computer classroom, an advanced digital conference room, analytical laboratories, and a centralised Skill Development Programme (SDP) office.

Speaking at the inaugural event, Director Dr Ashish Lele emphasised that the enhanced facilities will provide crucial practical exposure to specialised instruments, improve industrial competency, and foster impactful innovation. Chief Guest Dr Vinay Kumar commended the modern infrastructure, highlighting its alignment with the national vision of the CSIR-Integrated Skill Initiative to enhance scientific skill sets and build sustainable technological capacity.

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