

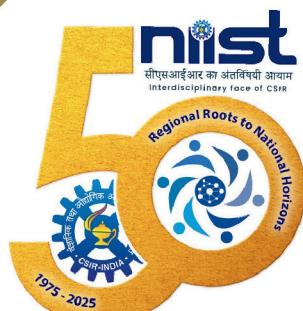


2024 - 2025

वार्षिक प्रतिवेदन

ANNUAL REPORT

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सीएसआईआर का अंतर्विषयी आयाम
Interdisciplinary face of CSIR



सीएसआईआर - राष्ट्रीय अंतर्विषयी विज्ञान तथा प्रौद्योगिकी संस्थान
इंडस्ट्रियल एस्टेट पीओ, तिरुवनंतपुरम

CSIR - National Institute For Interdisciplinary Science and Technology
Industrial Estate P.O, Thiruvananthapuram



भारत का नवाचार इंजन
The Innovation Engine of India



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CSIR - NATIONAL INSTITUTE FOR
INTERDISCIPLINARY SCIENCE AND TECHNOLOGY

वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद् (सी एस आई आर)
विज्ञान एवं प्रौद्योगिकी मंत्रालय, भारत सरकार
Council of Scientific and Industrial Research (CSIR)
Ministry of Science and Technology, Government of India

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Our Leaders



श्री. नरेंद्र मोदी

माननीय प्रधान मंत्री, भारत
अध्यक्ष, सी एस आई आर

Shri. Narendra Modi

Hon'ble Prime Minister of India
President, CSIR



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Vice President, CSIR



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Dr. C. Anandharamakrishnan

Director, CSIR-NIIST



निदेशक की कलम से

मैं अत्यंत गर्व और गहन उद्देश्य के साथ वर्ष 2024-25 के लिए सीएसआईआर-राष्ट्रीय अंतःविषय विज्ञान एवं प्रौद्योगिकी संस्थान (सीएसआईआर-एनआईआईएसटी) की वार्षिक प्रतिवेदन प्रस्तुत कर रहा हूँ - यह एक असाधारण महत्व का वर्ष है क्योंकि हम विज्ञान, नवाचार और राष्ट्रसेवा में अपनी यात्रा के 50 वर्ष पूरे होने का उत्सव मना रहे हैं।

यह वार्षिक प्रतिवेदन वर्षभर की उपलब्धियों और सम्मानों का सार प्रस्तुत करती है, जिसमें वित्तीय प्रगति, उच्च-प्रभाव वाले प्रकाशन, बौद्धिक संपदा (आईपी) सूजन, मानव संसाधन विकास, प्रमुख वैज्ञानिक कार्यक्रम, आउटरीच पहलें और उत्कृष्टता के प्रति हमारी प्रतिबद्धता को उजागर करने वाली सफलता की कहानियाँ शामिल हैं।

1975 में एक छोटी विश्लेषणात्मक प्रयोगशाला के रूप में अपनी विनम्र शुरुआत से, सीएसआईआर-एनआईआईएसटी आज एक अग्रणी बहु-विषयक अनुसंधान संस्थान के रूप में विकसित हुआ है, जो भारत की वैज्ञानिक, तकनीकी और सामाजिक-आर्थिक प्रगति में सार्थक योगदान दे रहा है। यह स्वर्ण जयंती वर्ष न केवल हमारी समृद्ध विरासत पर चिंतन का अवसर है, बल्कि एक सतत, आत्मनिर्भर और नवाचार-प्रधान भविष्य के प्रति हमारी प्रतिबद्धता की पुनः पुष्टि भी करता है।

वर्ष के दौरान, हमारे वैज्ञानिक प्रभागों ने अनुसंधान और नवाचार की सीमाओं को और आगे बढ़ाया है। कृषि प्रसंस्करण और प्रौद्योगिकी प्रभाग (एएफपीटीडी) स्थायी कृषि-तकनीक में एक राष्ट्रीय अग्रणी के रूप में उभरा, जिसने वृत्ताकार अर्थव्यवस्था मॉडल, पादप-आधारित खाद्य पदार्थों और जैव-निम्नीकरणीय टेबलवेयर का विकास किया, साथ ही 3डी खाद्य मुद्रण और व्यक्तिगत पोषण जैसी अत्याधुनिक तकनीकों का अन्वेषण किया। सतत ऊर्जा प्रौद्योगिकी केंद्र (सी-एसईटी), जो 2023 में स्थापित किया गया था, शीघ्र ही स्वच्छ ऊर्जा अनुसंधान के केंद्र के रूप में प्रसिद्ध हुआ - जिसमें

सौर ऊर्जा, हरित हाइड्रोजन, उन्नत बैटरीयाँ, ईंधन कोशिकाएँ, स्मार्ट सामग्रियाँ और अपशिष्ट-से-ऊर्जा समाधान शामिल हैं - जिससे राष्ट्रीय ऊर्जा सुरक्षा और नेट-ज़ीरो लक्ष्यों में हमारा योगदान सशक्त हुआ। रासायनिक विज्ञान और प्रौद्योगिकी प्रभाग (सीएसटीडी) ने हरित रसायन विज्ञान, फोटोनिक सामग्रियों और औषधि खोज के क्षेत्रों में उल्लेखनीय प्रगति की। साथ ही, पर्यावरण प्रौद्योगिकी प्रभाग (ईटीडी) ने अपशिष्ट प्रबंधन और नीति अनुसंधान में प्रभावशाली नवाचार प्रस्तुत किए। जिनमें भारत की पहली डाइऑक्सिन अनुसंधान सुविधा और नारियल उद्योग के लिए बॉयंट फ़िल्टर बायोरिएक्टर का संचालन शामिल है। बायोप्रोसेस और बायोइंजीनियरिंग प्रभाग (बीबीडी) ने लिम्नोसेल्यूलोसिक जैव-ईंधन, रोगाणुरोधी प्रतिरोध (एएमआर), कैसर निदान और आंत माइक्रोबायोम अध्ययन जैसे क्षेत्रों में महत्वपूर्ण प्रगति की। सामग्री विज्ञान और प्रौद्योगिकी प्रभाग (एमएसटीडी) ने टाटा स्टील, डीआरडीओ और बीआईएस जैसे भागीदारों के सहयोग से नैनोमटेरियल्स, सिरेमिक्स और टिकाऊ कोटिंग्स के क्षेत्र में प्रौद्योगिकियाँ विकसित कर भारत के रणनीतिक क्षेत्रों को सशक्त बनाया। समानांतर रूप से, कृत्रिम बुद्धिमत्ता और मशीन लर्निंग पर आधारित पहलों के माध्यम से हमारे डिजिटल परिवर्तन ने उल्लेखनीय गति प्राप्त की, जिससे कृषि, स्वास्थ्य सेवा और पर्यावरण निगरानी के लिए पूर्वानुमानित और वास्तविक समय के उपकरण विकसित हुए - जो समाजिक प्रभाव हेतु विज्ञान के हमारे मिशन को रूप देते हैं।

हमारे स्वर्णजयंती समारोह का औपचारिक उद्घाटन 17 अक्टूबर 2024 को माननीय केंद्रीय विज्ञान एवं प्रौद्योगिकी मंत्री डॉ. जितेंद्रसिंह द्वारा किया गया, जिसने वैज्ञानिक सम्मेलनों और जनसंपर्क कार्यक्रमों की वर्षभर चलने वाली शृंखलाकाशुभारंभ किया। हमें इस ऐतिहासिक उपलब्धि पर अत्यंत गर्व है और हम अगले 50 वर्षों को नई प्रतिबद्धता और उद्देश्य के साथ आकार देने के लिए तत्पर हैं। सीएसआईआर-एनआईआईएसटी ने 29 नवंबर से 3 दिसंबर 2024 तक आईआईटी गुवाहाटी में आयोजित भारत अंतर्राष्ट्रीय विज्ञान महोत्सव (आईआईएसएफ 2024) के लिए नोडल प्रयोगशाला के रूप में कार्य करने का गौरव प्राप्त किया। कौशल विकास गतिविधियाँ, विज्ञान दिवस, प्रौद्योगिकी दिवस, जिज्ञासा आउटरीच, सीएसआईआर स्थापना दिवस और सीएसआईआर-एनआईआईएसटी स्थापना दिवस को उत्साहपूर्ण भागीदारी के साथ मनाया गया।

मैं इस अवसर पर सीएसआईआर-एनआईआईएसटी के सभी सदस्यों - वैज्ञानिकों, छात्रों, तकनीकी और प्रशासनिक कर्मचारियों - के प्रति अपनी हार्दिक कृतज्ञता व्यक्त करता हूँ, जिनके समर्पण, रचनात्मकता और प्रतिबद्धता ने संस्थान की प्रगति को गति दी है। साथ ही, मैं सीएसआईआर मुख्यालय, महानिदेशक, सीएसआईआर, अनुसंधान परिषद के सदस्यों, केंद्र एवं राज्य सरकारों, अकादमिक जगत, उद्योग, सार्वजनिक एवं निजी क्षेत्रों, ग्राहकों, शुभचिंतकों और मीडिया के प्रति भी हार्दिक आभार व्यक्त करता हूँ, जिन्होंने सामूहिक रूप से सीएसआईआर-एनआईआईएसटी को एक जीवंत और प्रभावशाली अनुसंधान संगठन में परिवर्तित किया है।

जैसे-जैसे हम अपनी यात्रा के अगले अध्याय में कदम रख रहे हैं, हम अपने मिशन के प्रति अंडिग हैं और राष्ट्रीय विकास एवं वैश्विक भलाई के लिए विज्ञान, प्रौद्योगिकी और नवाचार में उच्च लक्ष्यों को प्राप्त करने के लिए प्रयास करते।

सी. आनंदरामकृष्णन

निदेशक, सी एस आई आर - एन आई आई एस टी



Foreword

It is with immense pride and a deep sense of purpose that I present the CSIR–National Institute for Interdisciplinary Science and Technology (CSIR–NIIST) Annual Report for the year 2024–25 – a year of exceptional significance as we celebrate 50 years of our journey in science, innovation, and service to the nation.

This annual report encapsulates the achievements and accolades received during the year, including financial performance, high-impact publications, intellectual property (IP) generation, human resource development, major scientific programs, outreach events, and success stories that highlight our commitment to excellence.

From its humble beginnings in 1975 as a small analytical laboratory, CSIR–NIIST has evolved into a premier multidisciplinary research institution contributing meaningfully to India's scientific, technological, and socio-economic progress. This Golden Jubilee year is not only a moment of reflection on our rich legacy but also a reaffirmation of our dedication to a sustainable, self-reliant, and innovation-led future.

During the year, our scientific divisions continued to push the frontiers of research and innovation. The Agroprocessing and Food Technology Division (AFPTD) emerged as a national leader in sustainable agri-tech, developing circular economy models, plant-based foods, and biodegradable tableware, while exploring cutting-edge technologies such as 3D food printing and personalized nutrition. The Centre for Sustainable Energy Technologies (C-SET), established in 2023, quickly rose to prominence as a hub for clean energy research, encompassing solar

energy, green hydrogen, advanced batteries, fuel cells, smart materials, and waste-to-energy solutions — furthering our contribution to national energy security and net-zero goals. The Chemical Sciences and Technology Division (CSTD) made major advances in green chemistry, photonic materials, and drug discovery. Simultaneously, the Environmental Technology Division (ETD) continued to deliver impactful innovations in waste management and policy research, including the operationalization of India's first Dioxin Research Facility and the Buoyant Filter Bioreactor for the coconut industry. The Bioprocess and Bioengineering Division (BBD) made significant progress in areas like lignocellulosic biofuels, antimicrobial resistance (AMR), cancer diagnostics, and gut microbiome studies. The Materials Science and Technology Division (MSTD) reinforced India's strategic sectors with technologies in nanomaterials, ceramics, and sustainable coatings, developed in collaboration with partners like TATA Steel, DRDO, and BIS. In parallel, our digital transformation gained momentum through artificial intelligence and machine learning initiatives that created predictive and real-time tools for agriculture, healthcare, and environmental monitoring - embodying our mission of science for societal impact.

The Institute also witnessed a vibrant calendar of institutional and national programs. Our Golden Jubilee celebrations were formally inaugurated on October 17, 2024, by the Hon'ble Union Minister for Science and Technology, Dr. Jitendra Singh, marking the start of a year-long series of scientific gatherings and public engagement events. We take immense pride in commemorating this historic milestone and look forward to shaping the next 50 years with renewed commitment and purpose. CSIR-NIIST proudly served as the nodal laboratory for the India International Science Festival (IISF 2024), held at IIT Guwahati from November 29 to December 3, 2024. Skill development activities, Science Day, Technology Day, Jigyasa outreach, CSIR Foundation Day, and CSIR-NIIST Foundation Day were conducted with enthusiastic participation.

I take this opportunity to express my sincere gratitude to all members of CSIR-NIIST - scientists, students, technical and administrative staff - whose dedication, creativity, and resilience have powered the Institute's progress. I extend heartfelt thanks to CSIR Headquarters, the Director General of CSIR, RC members, and our valued partners across Central and State Governments, academia, industry, public and private sectors, clients, well-wishers, and the media, who have collectively contributed to transforming CSIR-NIIST into a vibrant and impactful research organization.

As we step into the next chapter of our journey, we remain steadfast in our mission and will continue striving to achieve higher goals in science, technology, and innovation for national development and global good.

C. Anandharamakrishnan

Director, CSIR - NIIST

CHAIRMAN



Padmabhushan Dr. KRISHNA ELLA
Founder, Executive Chairman and Managing Director
Bharat Biotech International Limited

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Senior Principal Scientist
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MANAGEMENT COUNCIL

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(Director, CSIR-NIIST)



Dr. K. RAMESHA
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Dr. NISHY P.
(Chief Scientist)



Dr. U. S. HAREESH
(Chief Scientist)



Dr. RAKHI R. B.
(Principal Scientist)



Dr. K. G. NISHANTH
(Principal Scientist)



Dr. K. VASANTH RAGHAVAN
(Senior Scientist)



Mr. R. RAJEEV
(Sr. Superintending Engineer)

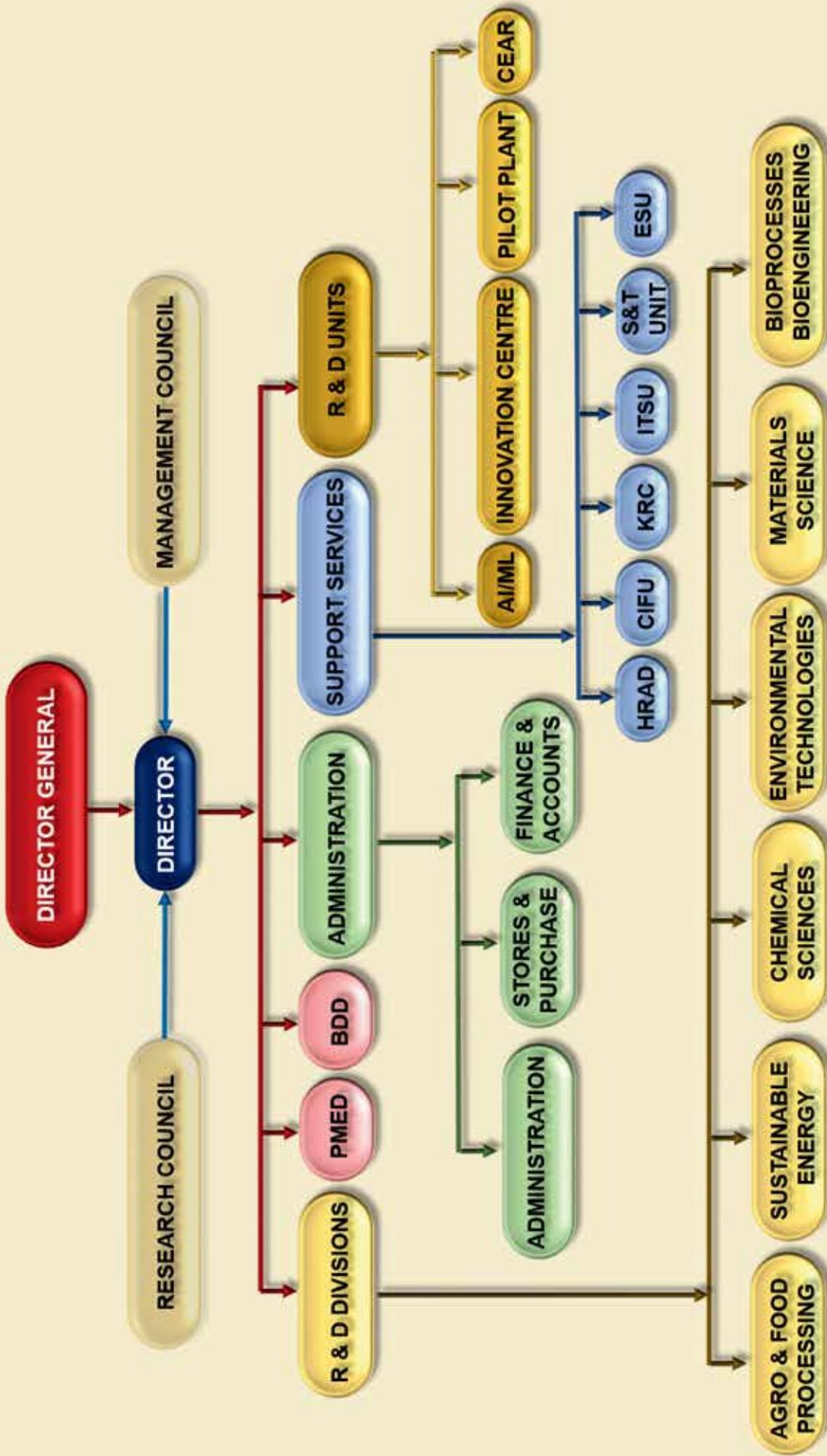


Mr. SHYAM SUNDER SINGH
(FAO, CSIR-NIIST)



Mr. SRINIVASA RAO YELLA
(CoA, CSIR-NIIST)

Organizational Structure





Significant Achievements

महत्वपूर्ण उपलब्धियाँ 2024 - 2025

भारतीय विज्ञान और प्रौद्योगिकी के सतत प्रगतिशील परिदृश्य में, सीएसआईआर-राष्ट्रीय अंतर्वैज्ञानिक विज्ञान और प्रौद्योगिकी संस्थान (CSIR-NIIST), तिरुवनंतपुरम, अनुसंधान, नवाचार और जनसेवा के 50 गौरवशाली वर्षों का उत्सव मना रहा है। 1975 में एक छोटे विश्लेषणात्मक प्रयोगशाला के रूप में स्थापित यह संस्थान आज भारत के अग्रणी अनुसंधान संस्थानों में से एक बन चुका है। कृषि प्रसंस्करण, रासायनिक विज्ञान, ऊर्जा, सामग्री विज्ञान, जैव विज्ञान और पर्यावरणीय स्थिरता जैसे विविध क्षेत्रों में संस्थान ने राष्ट्रीय मिशनों को मजबूती से समर्थन प्रदान किया है। अंतर्वैज्ञानिक अनुसंधान को मूल में रखते हुए, और शिक्षाविदों, उद्योगों तथा सरकार के साथ सहयोग को बल देते हुए, CSIR-NIIST ने हमेशा प्रयोगशाला की खोजों को व्यावहारिक समाधान में रूपांतरित किया है। यह संस्थान नवाचार, नीतियों और आर्थिक विकास को सतत गति प्रदान कर रहा है।

संस्थान की नवाचार यात्रा के केंद्र में “कृषि प्रसंस्करण एवं खाद्य प्रौद्योगिकी प्रभाग (AFPTD)” है, जो खाद्य एवं कृषि-तकनीक अनुसंधान का प्रमुख केंद्र है। इस प्रभाग ने मिलेट्रॉप, मसालों और तिलहनों से मूल्यवर्धित उत्पाद, पौधों से बने मांस विकल्प, और बायोडिग्रेडेबल टेबलवेयर जैसी तकनीकों का विकास किया है। सस्टेनेबिलिटी और सर्कुलर इकोनॉमी को बढ़ावा देने वाले यह नवाचार MSMEs से जुड़ी मजबूत औद्योगिक सहभागिता के साथ क्रियान्वित किए जा रहे हैं। उभरती हुई तकनीकों जैसे 3D फूड प्रिंटिंग और पर्सनलाइज्ड न्यूट्रिशन के माध्यम से खाद्य नवाचार की सीमाओं को आगे बढ़ाया जा रहा है। 2023 में प्रारंभ हुआ “सेंटर फॉर सस्टेनेबल एनर्जी टेक्नोलॉजीज (C-SET)” संस्थान की ऊर्जा अनुसंधान गतिविधियों को एकीकृत करता है, जिसमें सौर ऊर्जा, बैटरियां, प्ल्यूल सेल्स, ग्रीन हाइड्रोजन और स्मार्ट मटीरियल्स शामिल हैं। C-SET, एग्रीवोल्टेक्स, बिल्डिंग इंटीग्रेटेड पीवी सिस्टम्स (BIPV), और जैव चिकित्सा अपशिष्ट प्रबंधन जैसे क्षेत्रों में भी अग्रणी भूमिका निभा रहा है। इसका मुख्य उद्देश्य स्वदेशी प्रौद्योगिकी विकास और भारत की स्वच्छ ऊर्जा की ओर संक्रमण को गति देना है।

रासायनिक विज्ञान और प्रौद्योगिकी प्रभाग (CSTD) ग्रीन केमिस्ट्री, औषधि खोज, और फोटोनिक्स व सेंसिंग के लिए उन्नत सामग्री निर्माण में अग्रणी है। इस प्रभाग ने फाइटोकेमिकल ड्रग लीड्स, APIs, फ्लोरोसेंट इंक और पेरोव्स्काइट नैनोक्रिस्टल्स जैसे क्षेत्रों में उल्लेखनीय उपलब्धियाँ प्राप्त की हैं, जिनका नेतृत्व संस्थान के सबसे बड़े शोधार्थी समूहों में से एक करता है। पर्यावरणीय प्रौद्योगिकी प्रभाग (ETD) ने ठोस अपशिष्ट प्रबंधन, जैव-वैद्युत रासायनिक हाइड्रोजन उत्पादन और अपशिष्ट जल उपचार में क्रांतिकारी नवाचार किए हैं। नारियल उद्योग के लिए विकसित “Buoyant Filter Bioreactor (BFBR)” संयंत्र और भारत की पहली “Dioxin Research Facility” इसकी प्रमुख उपलब्धियाँ हैं।

बायोप्रोसेस और बायोइंजीनियरिंग डिवीजन (BBB) भविष्य की स्वास्थ्य और जैव ईंधन समाधानों पर काम कर रहा है — जैसे लिमोसेलुलोसिक एथेनॉल, एंजाइम्स, SERS आधारित कैंसर डायग्नोस्टिक्स, AMR अध्ययन और गट माइक्रोबायोम अनुसंधान — जो वैश्विक प्रिसीजन हेल्थ लक्ष्यों के अनुरूप हैं। सामग्री विज्ञान एवं प्रौद्योगिकी प्रभाग (MSTD) ने रणनीतिक क्षेत्रों में जैव-रेजिन, सिरेमिक और नैनोमटीरियल्स पर काम करते हुए टाटा स्टील, DRDO, HAL जैसी संस्थाओं के साथ मिलकर बायो-बेस्ड पेपर कोटिंग और BIS गोल्ड हॉलमार्किंग जैसी तकनीकों का विकास किया है। डिजिटल परिवर्तन की दिशा में, संस्थान की AI/ML इकाई कृषि, स्वास्थ्य और पर्यावरण के लिए पूर्वानुमानात्मक टूल्स विकसित कर रही है — जिनमें रीयल-टाइम डिज़ीज ट्रैकिंग और इमेज एनालिसिस जैसे समाधान शामिल हैं, जो सार्वजनिक और औद्योगिक उपयोग के लिए स्केलेबल हैं।

विज्ञान, अनुसंधान और नवाचार में अग्रणी योगदानों से पेरे, CSIR-NIIST ने अपनी अद्वितीय संगठनात्मक क्षमता का प्रदर्शन किया, जब उसने 30 नवंबर से 3 दिसंबर 2024 तक IIT गुवाहाटी, असम में आयोजित “भारत अंतरराष्ट्रीय विज्ञान महोत्सव (IISF 2024)” के 10वें संस्करण का सफलतापूर्वक समन्वय किया। यह महोत्सव पहली बार पूर्वोत्तर भारत में आयोजित हुआ, जो अपने आप में एक ऐतिहासिक उपलब्धि थी। CSIR के नेतृत्व में, दक्षिण भारत के तिरुवनंतपुरम स्थित CSIR-NIIST ने इस आयोजन को पूरी निष्ठा और समर्पण के साथ संचालित किया। संस्थान के वैज्ञानिकों, कर्मचारियों और छात्रों ने उत्तर-पूर्व की सीमाओं तक यात्रा कर, शानदार समन्वय और टीम भावना का परिचय देते हुए इस महोत्सव को अब तक के सबसे सफल आयोजनों में से एक बना दिया। यह उपलब्धि संस्थान को न केवल वैज्ञानिक उत्कृष्टता का केंद्र सिद्ध करती है, बल्कि उसे राष्ट्रीय विज्ञान समुदाय के लिए सेवा, समर्पण और एकता का प्रतीक भी बनाती है।

अपनी स्वर्ण जयंती के अवसर पर CSIR-NIIST अपने गौरवशाली अतीत पर गर्व करते हुए, भविष्य की ओर नए संकल्पों के साथ अग्रसर है - वैश्विक सहयोगों को सशक्त बनाना, प्रौद्योगिकी हस्तांतरण को गति देना और ‘मेक इन इंडिया’, ‘आत्मनिर्भर भारत’ तथा ‘नेट जीरो कार्बन’ जैसे राष्ट्रीय अभियानों को समर्थन देना इसके प्रमुख लक्ष्य हैं।

पचास वर्षों की प्रभावशाली वैज्ञानिक यात्रा के साथ, CSIR-NIIST भारत और विश्व के लिए एक सशक्त, टिकाऊ और नवाचार-प्रधान भविष्य के निर्माण हेतु पुनः समर्पित है।

Significant Achievements 2024-25

In the ever-evolving landscape of Indian science and technology, the CSIR-National Institute for Interdisciplinary Science and Technology (CSIR-NIIST), Thiruvananthapuram, celebrates 50 years of pioneering research, innovation, and public service. Established in 1975 as a small analytical lab, CSIR-NIIST has grown into one of India's premier research institutions, contributing significantly to national missions across agroprocessing, chemical sciences, energy, materials, biosciences, and environmental sustainability. Rooted in interdisciplinary science and strengthened by collaborations with academia, industry, and government, the institute has consistently translated research into real-world solutions, driving innovation, policy, and economic development.

At the forefront of NIIST's innovation journey is the Agro & Food Processing and Technology Division (AFPTD), a hub for food and agri-tech R&D. From developing value-added products from millets, spices, and oilseeds to plant-based meat and biodegradable tableware, the division champions sustainability and circular economy models. Emerging technologies like 3D food printing and personalized nutrition are pushing the boundaries of food innovation, with strong industry engagement, especially from MSMEs. The Centre for Sustainable Energy Technologies (C-SET), inaugurated in 2023, unifies NIIST's energy research — spanning solar, batteries, fuel cells, green hydrogen, and smart materials. It is also pioneering agrivoltaics, BIPV systems, and biomedical waste management technologies. With a focus on indigenous development, C-SET supports energy self-reliance and the nation's transition to clean energy.

The Chemical Sciences and Technology Division (CSTD) continues to excel in green chemistry, drug discovery, and materials for photonics and sensing. Notable areas include phytochemical drug leads, APIs, fluorescent inks, and perovskite nanocrystals, supported by one of the largest doctoral cohorts at NIIST. In environmental innovation, the Environmental Technology Division (ETD) leads breakthroughs in solid waste management, bio-electrochemical hydrogen, and effluent treatment. Its flagship Buoyant Filter Bioreactor (BFBR) plant for the coconut industry, and India's first Dioxin Research Facility, underscore its commitment to sustainability and policy support.

The Bioprocess and Bioengineering Division (BBD) is developing next-gen health and biofuel solutions — from lignocellulosic ethanol and enzymes to SERS-based cancer diagnostics, AMR studies, and gut microbiome research — aligning with global precision health goals. Materials Science and Technology Division (MSTD) advances India's strategic sectors with innovations in nanomaterials, ceramics, and bio-resins. Collaborating with TATA Steel, DRDO, HAL, and others, MSTD has delivered technologies like bio-based paper coatings and a BIS Gold Hallmarking facility. Embracing digital transformation, NIIST's AI/ML Unit is building predictive tools for agriculture, healthcare, and environment — including real-time disease tracking and image analysis — offering scalable, tech-driven solutions for public and industrial use.

Beyond its pioneering contributions to science, research, and innovation, CSIR-NIIST showcased its exceptional organizational capability by successfully coordinating the 10th edition of the India International Science Festival (IISF 2024), held from 30 November to 3 December 2024 at the Indian Institute of Technology (IIT) Guwahati, Assam. Significantly, this was the first time the festival was hosted in North East India, marking a milestone in the event's history. Entrusted with the responsibility by the Council of Scientific and Industrial Research (CSIR), CSIR-NIIST, based in Thiruvananthapuram, led the organization of the event with remarkable dedication. The Institute's faculty, staff, and students journeyed from the southern tip of the country to the North-Eastern frontiers, demonstrating unwavering commitment, teamwork, and excellence in execution. Their collective efforts resulted in one of the most memorable and successful editions of IISF, reinforcing CSIR-NIIST's reputation not only as a centre of scientific excellence but also as a model of unity, coordination, and service to the national scientific community.

As CSIR-NIIST marks its Golden Jubilee, it reflects on a legacy of excellence and looks forward with renewed purpose — deepening global collaborations, accelerating technology transfers, and advancing national missions like Make in India, Atmanirbhar Bharat, and Net-Zero Carbon.

With 50 years of impactful science, CSIR-NIIST rededicates itself to building a resilient, sustainable, and innovation-led future for India and the world.

Key Performance Indicators

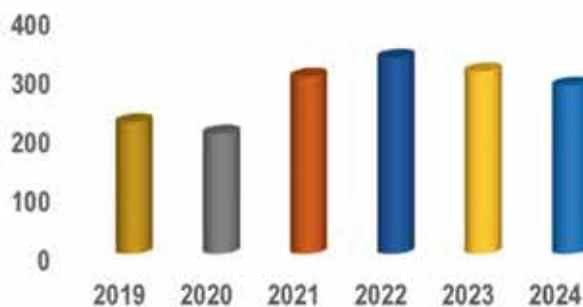
CSIR-NIIST TOTAL STAFF

146		2020-21
149		2021-22
149		2022-23
155		2023-24
160		2024-25

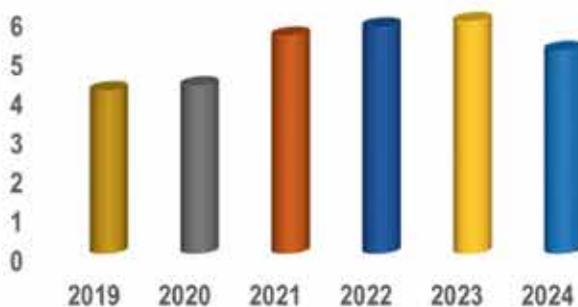
NUMBER OF SCIENTIST

77		2020-21
85		2021-22
85		2022-23
79		2023-24
79		2024-25

No of Publications

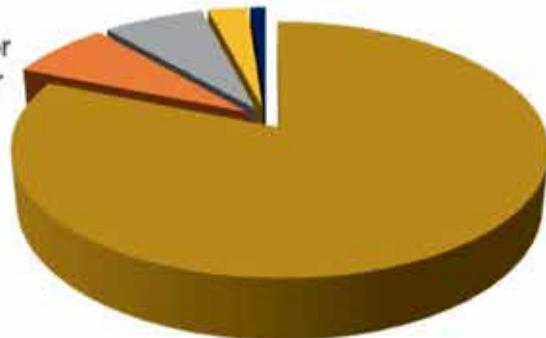


Avg Impact Factor

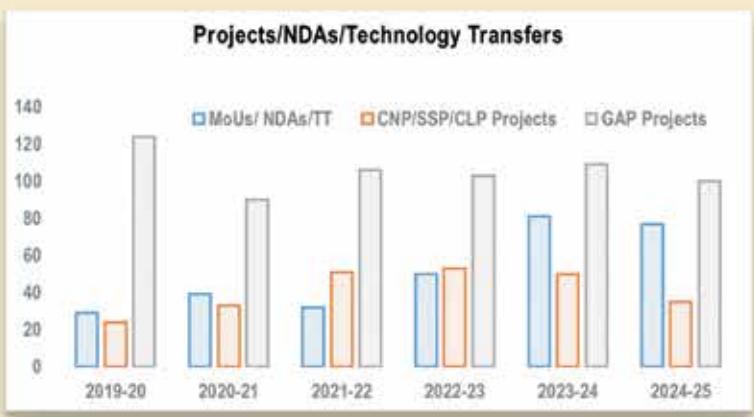
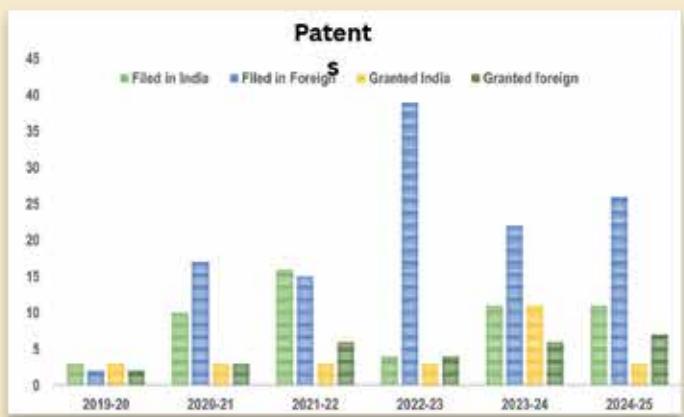
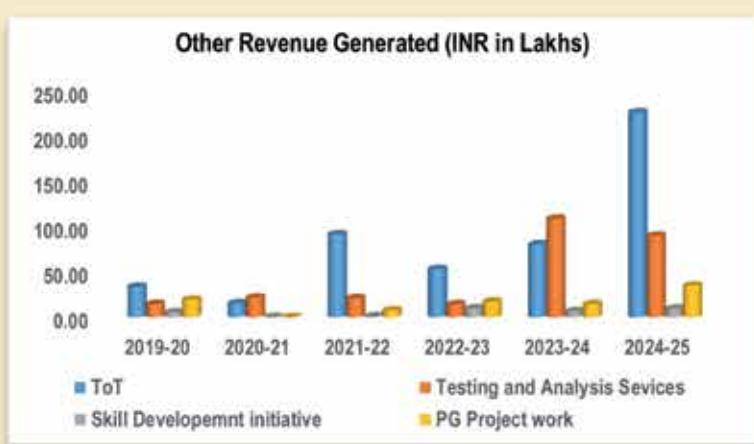
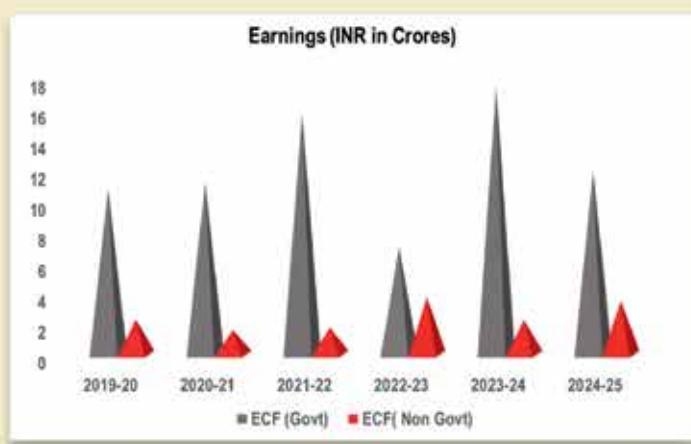
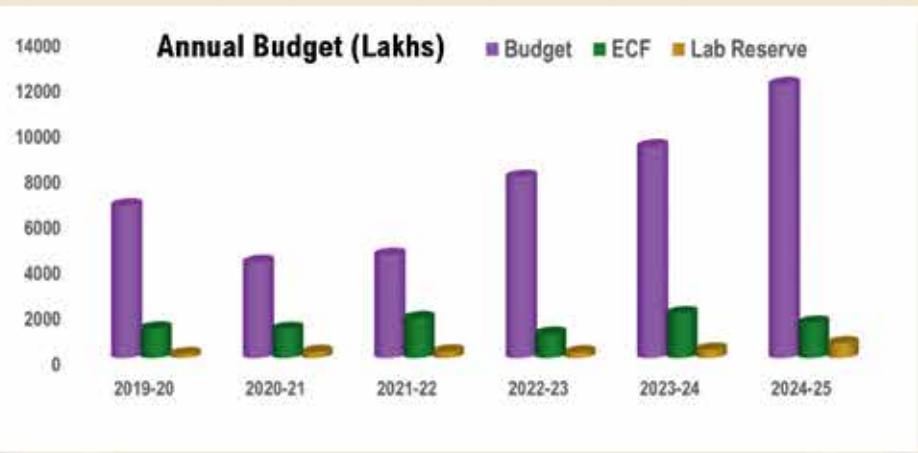


External Cash Flow

- Central Govt
- State Govt
- Private Sector
- Public Sector
- Foreign



Key Performance Indicators





Success Stories

Development and Commercialization of Biodegradable cutlery from Pineapple Leaf Waste: A Collaborative Research Success

Kerala produces around 400,000 tonnes of pineapples annually, generating approximately 20,000–25,000 tonnes of leaf waste per acre. This poses significant environmental challenges but also offers untapped economic potential. The GI-tagged Vazhakulam pineapple supports the livelihoods of nearly 400,000 people across 18 villages in Muvattupuzha Taluk, highlighting the need for sustainable waste management.

The Agro & Food Processing Technology Division of CSIR-NIIST, in collaboration with Vazhakulam Agro and Fruit Processing Company Limited (VAFPCL), developed an innovative, chemical-free technology to convert pineapple leaf waste into biodegradable cutlery, offering an eco-friendly alternative to single-use plastics. These products are microwave-safe, leak-proof, decompose fully within 30 days, and adhere to food safety standards. This innovation addresses key challenges of existing alternatives, such as limited areca leaf supply and environmentally harmful bagasse processing. The process includes an optional bio-coating step for added durability. Under the Rashtriya Krishi Vikas Yojana (RKVY), a pilot-scale facility was set up at VAFPCL with a ₹255 lakh investment. The plant processes 500 kg of pineapple leaves daily, producing 1,920 plates and 100 liters of bio-coating oil per 8-hour shift.

The initiative demonstrates significant environmental impact through plastic waste reduction and agricultural residue valorization. It has also led to direct employment generation, women's empowerment, and economic diversification for rural communities. This successful lab-to-market translation serves as a replicable model for sustainable innovation, positioning Kerala as a leader in eco-friendly technologies.

PRODUCTS



PLANT INSTALLED AT VFPCL

CSIR-NIIST's Sustainable Innovation Partnership with AGRIWARI Private Limited for Biodegradable Tableware Manufacturing from Rice Husk

CSIR-NIIST achieved a major milestone in sustainable technology transfer through a successful collaboration with AGRIWARI Private Limited. In March 2024, CSIR-NIIST signed a comprehensive technology transfer agreement to establish a commercial-scale biodegradable tableware unit in Narasaraopeta, Palnadu District, Andhra Pradesh. The facility, with a processing capacity of 500 kg of rice husk per day, manufactures biodegradable plates, bowls, tumblers, spoons, forks, and knives—offering a sustainable alternative to single-use plastics. The technology package included end-to-end support: detailed process documentation, plant layout, technical specifications, analytical protocols, and consultancy for efficient implementation.

This innovation not only promotes agricultural waste valorization but also exemplifies CSIR-NIIST's commitment to translating lab-scale research into commercially viable, eco-friendly solutions. The unit showcases circular economy principles by transforming agro-waste into high-value products, contributing to environmental conservation and rural economic development. The project received significant public recognition during World Environment Day 2024 in Guntur. Andhra Pradesh Chief Minister N. Chandrababu Naidu and Minister for Environment Pawan Kalyan visited the exhibition where CSIR-NIIST's biodegradable tableware technology was prominently featured among key innovations addressing plastic pollution.

This initiative stands as a replicable model for sustainable industry partnerships, positioning CSIR-NIIST as a leader in environmental innovation and supporting state-level and national goals for a plastic-free, sustainable future.



Converting Pathogenic Biomedical Waste into Value-added Soil Additives

CSIR-NIIST, Thiruvananthapuram

India generates approximately 743 tonnes of biomedical waste daily (CPCB, 2023), posing serious environmental and health risks due to improper disposal practices such as open dumping, burning, and inefficient incineration. These methods release harmful carcinogens like dioxins, furans, and particulate matter, along with hazardous ash residues. The rising waste volume also increases transportation risks, including spills and accidents.

In response, CSIR-NIIST has developed an automated biomedical waste conversion rig that offers an incineration-free solution for managing pathogenic biomedical waste. The system effectively disinfects and immobilizes infectious materials such as blood, urine, sputum, and laboratory disposables. It also eliminates foul odors by imparting a natural fragrance and enables direct recycling of disinfected disposables. Validated by third-party experts, the treated waste has shown strong antimicrobial activity and is confirmed to be non-toxic. Soil studies further reveal that the treated material is superior to conventional organic fertilizers like vermicompost, enabling its use as a value-added soil additive.

The rig was installed at AIIMS, New Delhi and inaugurated on 10 February 2025 by Dr. Jitendra Singh, Hon'ble Minister of State (I/C) for Science & Technology and Vice President, CSIR, in the presence of senior officials from NITI Aayog, DSIR, CSIR, MoEFCC, and ICMR. This point-of-care solution reduces human intervention, occupational hazards, and the risk of infectious disease spread. With successful validation, CSIR-NIIST is poised to scale this innovative, eco-friendly technology nationally and globally, offering a safe and sustainable alternative to incineration.

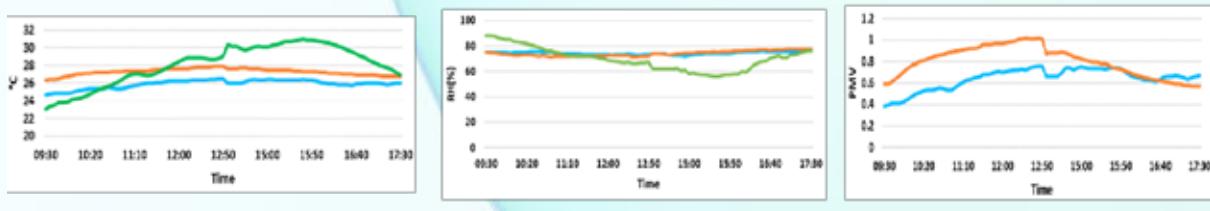


Field-testing of thermoregulation using electrochromic windows developed by CSIR-NIIST

CSIR-NIIST has successfully validated its electrochromic (EC) smart window technology through installation in two full-scale building prototypes. Field trials demonstrated the EC windows' effectiveness in enhancing indoor environmental quality and reducing energy demand. Compared to conventional windows, EC smart windows significantly reduced indoor peak temperatures, especially during midday hours, and maintained more stable thermal conditions throughout the day. They also contributed to better relative humidity control, fostering a healthier and more comfortable indoor environment.

Importantly, Predicted Mean Vote (PMV) indices confirmed improved occupant thermal comfort, eliminating mid-day discomfort peaks commonly associated with standard glazing. Real-time data monitoring further highlighted the EC windows' dynamic adaptability to outdoor light and temperature conditions, ensuring consistent comfort while reducing reliance on active cooling systems. In addition to validating field durability, aesthetic compatibility, and energy-saving potential, the project developed standard operating procedures and an IoT-based control platform, enabling smart, automated operation of the windows. These advancements underscore the readiness of EC smart windows for large-scale deployment in climate-responsive and energy-efficient building designs.

This innovation aligns with national goals for sustainable infrastructure and green buildings, offering a scalable solution to reduce energy consumption, enhance occupant well-being, and mitigate environmental impact in the built environment.



PavanaChitra: Reflecting Sustainability Through the Mooring Mirror of Theyyam

PavanaChitra, inaugurated by Dr. Jitendra Singh, Union Minister of State (I/C) for Science & Technology, on October 17, 2024, is a unique installation that blends environmental awareness, indigenous art, and cutting-edge sustainable technology. The name, derived from Sanskrit—Pavana (air) and Chitra (art)—symbolizes the harmony between clean air and cultural expression.

At its core, PavanaChitra features an off-grid, self-powered indoor air quality monitoring system powered by indigenous dye-sensitized indoor solar cells, developed by CSIR-NIIST. Mimicking natural photosynthesis, these cells operate efficiently under indoor lighting using locally sourced materials. Air quality data is presented on an ultra-low-power e-paper display, ensuring continuous monitoring without external power. The installation draws deeply from Kerala's cultural heritage, integrating the traditional ritual art form of Theyyam. A hand-crafted wooden representation of Theyyam's iconic Mooring Mirror forms the centerpiece, reimagined to reflect our shared environmental responsibility. By embedding air quality awareness—especially crucial indoors, where pollution levels often exceed outdoor levels—into the visual and spiritual language of Theyyam, PavanaChitra transforms scientific data into a visually engaging and culturally resonant experience.

PavanaChitra stands as a beacon of climate innovation, showcasing how science, sustainability, and tradition can converge to inspire public consciousness. It reflects CSIR-NIIST's commitment to promoting environmental stewardship through integrated, culturally rooted solutions, making it a model for climate-aware, technology-driven public engagement.



Demonstration of BFBR Technology for Wastewater Treatment in the Desiccated Coconut Industry

CSIR-NIIST has successfully addressed a major environmental challenge in the desiccated coconut (DC) industry through the development and demonstration of an innovative "Buoyant Filter Bioreactor" (BFBR) technology. Designed for high-rate anaerobic treatment, the BFBR efficiently handles high-strength organic wastewater rich in oil, fat, and suspended solids—common in coconut processing effluents.

A 60 KLD demonstration-scale BFBR plant was commissioned at M/s. Vittal Agro Industries, Kasaragod, identified by the Coconut Development Board (CDB). The project was funded by the Department of Science and Technology (DST) and supported by the Kerala State Pollution Control Board (KSPCB). The plant is capable of generating 500 m³ of biogas and producing 60,000 liters of reuse-quality water daily, offering both environmental and economic benefits. The facility was inaugurated on 2 September 2024, in the presence of representatives from CSIR-NIIST, DST, CDB, DSIR-CRTDH, KSPCB, local governance bodies, and industry stakeholders. Visitors toured the plant to observe its design features, operation, and replication potential. This technology provides a scalable and sustainable model for the treatment of industrial effluents in over 180 similar units across India, aligning with national goals for waste-to-energy, water reuse, and pollution reduction.

The successful demonstration marks a significant step forward in eco-friendly industrial wastewater management, reinforcing CSIR-NIIST's role in delivering innovative, impact-driven solutions for environmental sustainability in agro-industries.

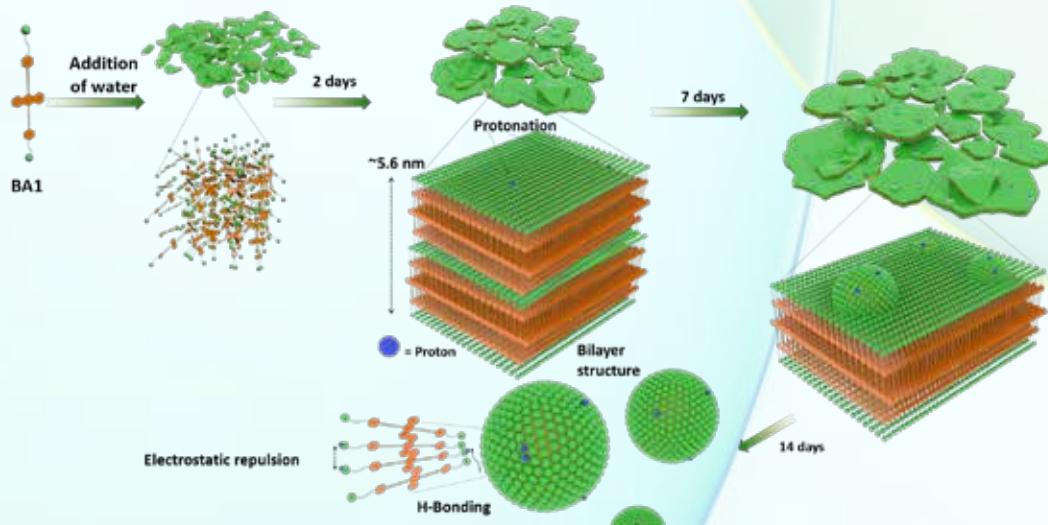


Spontaneous Curvature Induction in an Artificial Bilayer Membrane

Maintaining lipid asymmetry across membrane leaflets is essential for biological processes such as vesicular trafficking and organelle homeostasis. However, the lack of molecular-level understanding of fission and fusion mechanisms in synthetic systems limits the development of functional artificial membranes.

In a recent study, CSIR-NIIST demonstrated the induction of asymmetry in a synthetic bilayer membrane formed by a π -conjugated molecule with oxyalkylene side chains terminating in tertiary amines. In aqueous environments, autogenous protonation of these amines at the bilayer periphery induces anisotropic curvature, triggering membrane fission and vesicle formation. These dynamic transformations were tracked using time-dependent spectroscopy and microscopy. Strikingly, the induced asymmetry and resulting curvature are reversible. Upon extensive protonation with an organic acid, the membrane returns to its bilayer state, demonstrating a controllable mechanism for membrane remodeling. Density Functional Theory (DFT) calculations validated the mechanism of compositional asymmetry and curvature induction, highlighting the role of hydrophobic interactions and the hydrated state of molecular aggregates in maintaining dynamic yet stable membrane structures.

This study provides key mechanistic insights into the spontaneous transformation of synthetic bilayers into vesicles, bridging a crucial gap in understanding artificial membrane dynamics. The findings pave the way for designing stimuli-responsive membrane systems, with potential applications in drug delivery, biosensing, and artificial cell models.



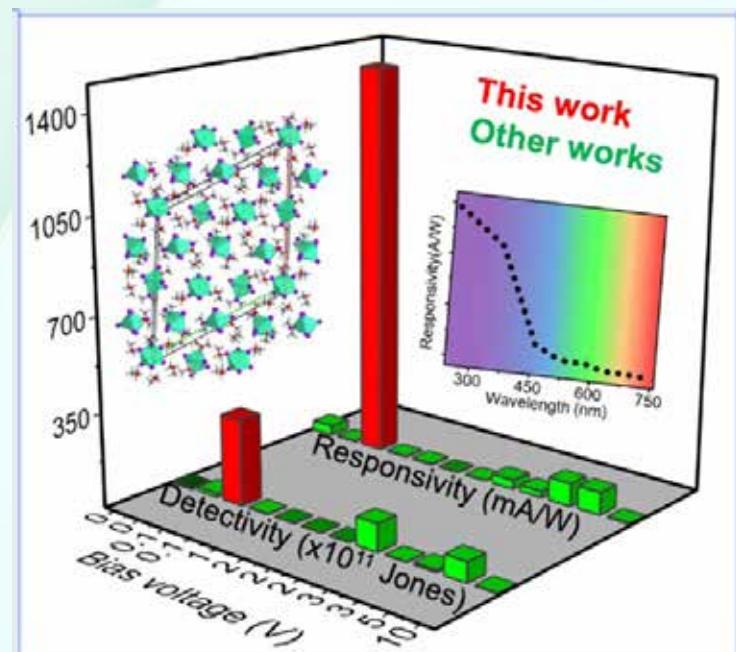
Reference:

Angew. Chem., Int. Ed. 2024, 63, e202403900.

Lead-Free DMABI Perovskite Sets New Benchmark for Ultra-Sensitive Deep-UV Photodetection

Researchers at the Chemical Sciences and Technology Division, CSIR-NIIST have developed dimethylamine bismuth iodide (DMABI), a novel lead-free halide perovskite with outstanding potential for ultra-sensitive UVC photodetectors. DMABI features a zero-dimensional crystal structure consisting of isolated $[\text{BiI}_6]^{3-}$ octahedra, which suppress dark current to an ultra-low 0.12 pA at 0.05 V. Under UVC illumination, photoexcited carriers hop between octahedra, generating a strong photocurrent response.

The fabricated photodetector based on DMABI delivers exceptional performance metrics: Responsivity: 1.46 A W⁻¹; External Quantum Efficiency (EQE): up to 71%; Detectivity: 3.18×10^{13} Jones; On/Off Ratio: 7.1×10^4 . These figures set a new benchmark among bismuth-based UV detectors. Notably, the device operates at ultra-low voltages and retains its performance under ambient conditions without encapsulation. The inclusion of a compact organic cation (dimethylamine) enhances both charge transport and material stability. Long-term exposure tests confirm excellent air, water, UV, and thermal stability, establishing DMABI as a robust and environmentally friendly alternative to lead-based perovskites. Additionally, the material's low-cost synthesis, non-toxic composition, and high optoelectronic performance make it highly attractive for next-generation deep-UV sensing technologies.



DMABI represents a significant step forward in developing sustainable, high-performance photodetectors for applications in environmental monitoring, medical diagnostics, and secure communications.

Reference:

Adv. Mater. 2025, 37, 2411332.

Record Indoor Solar Efficiency of 40% Achieved using Dye-sensitized Light Harvesters

Enhanced indoor photovoltaic efficiency of 40% in dye-sensitized solar cells was achieved by CSIR-NIIST team using cocktail starburst triphenylamine dyes and dual-species copper electrolyte indigenously designed and synthesized at CSIR-NIIST. Precise structural modifications of dye and electrolyte components create a robust barrier against recombination, marking a transformative leap in sustainable indoor light harvesting. We unveil starburst triphenylamine dye cocktails paired with dual-species copper (II/I) electrolyte, driving dye-sensitized solar cells to 40% efficiency under indoor lighting. This innovation paves the way for self-powered electronics, significantly reducing the environmental impact of discarded batteries and contributing to a greener, low-carbon future.

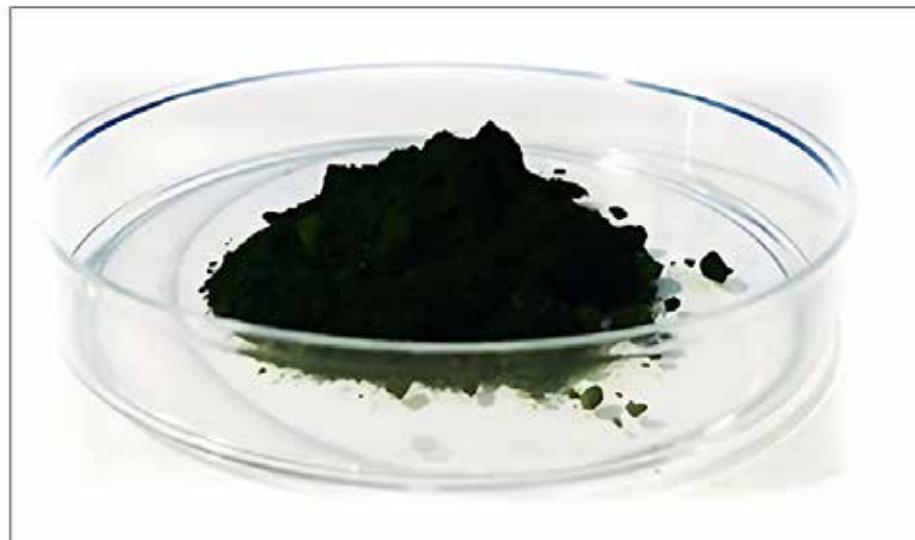


Reference:

J. Mater. Chem. A, 2024, 12, 32721

Organic selenium-enriched edible marine microalgal biomass

Selenium is an essential trace element critical for various physiological functions, primarily through its incorporation into a class of proteins known as selenoproteins, which play vital roles in antioxidant defence, immune modulation, and thyroid hormone metabolism. While organic selenium is typically obtained from dietary sources such as meat, fish, and grains, significant losses occur during cooking and food processing, contributing to widespread selenium deficiency in many populations. To address this nutritional gap, the current invention presents a novel approach for developing a selenium-enriched, edible marine microalga. Through sequential strain improvement, we have developed a microalga strain with an exceptional selenium biotransformation efficiency, converting over 99% to organic form. Remarkably, the optimised strain maintained normal growth kinetics and biomass yield even under high selenium uptake, demonstrating its robust physiological adaptability. This selenium-fortified algal biomass offers a sustainable, bioavailable, and clinically relevant source of organic selenium. Its potential application as a functional food or feed additive holds promise for preventing selenium deficiency and supporting antioxidant-based therapeutic interventions in human and animal health.



Organic selenium-enriched edible marine microalgal biomass

Reference:

UK Patent No. GB2603709 dated 07-08-2024

The background of the image features a large, abstract, irregular shape filled with a light green color. This shape has several white, wavy, liquid-like protrusions and recesses of varying sizes, creating a dynamic and organic feel. It is centered on the page and serves as a backdrop for the text.

Research Programs

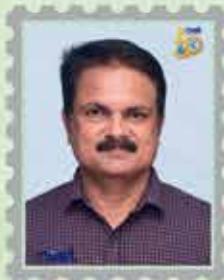


Agro & Food Processing Technology





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(Executive Engineer)



Mr. Thasim J.
(Technician -1)

The Agro & Food Processing Technology Division (AFPTD) is a dynamic R&D hub comprising 10 scientists, 2 technical officers, 1 technician, and around 40 research scholars, including AcSIR PhD students, post-doctoral fellows, and project associates. The Division focuses on post-harvest value addition, functional foods and nutraceuticals, agro-waste valorisation, and bioactives for human health.

AFPTD has developed and commercialised technologies in millet, spice, oilseed, fruit, and vegetable processing, while also advancing sustainable innovations such as plant-based leather from cactus and agri-fibres, and vegan meat and dairy alternatives. Its biodegradable tableware and packaging from agri-residues offer viable alternatives to single-use plastics, reinforcing the waste-to-wealth model.

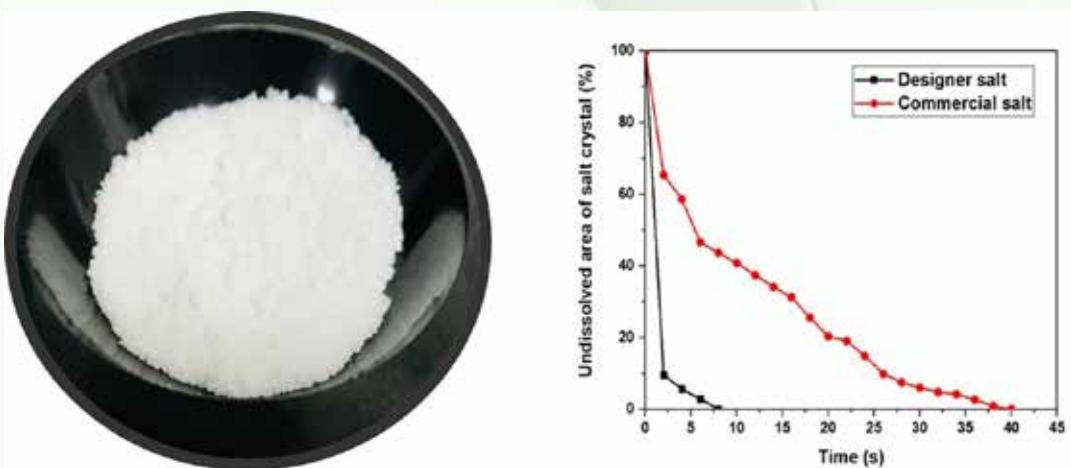
Research on bioactives targets lifestyle disorders, while emerging areas like 3D food printing open doors to personalised nutrition for healthcare, defence, and premium markets. A dedicated pilot plant facility supports incubation and scale-up, enabling smooth lab-to-market transitions. Strong industry linkages further solidify AFPTD's role as a national leader in agroprocessing innovation.



Designer salt

Dr. C. Anandharamakrishnan

Salt is a major dietary source of sodium, which is involved in maintaining normal cellular homeostasis, regulating blood pressure, and metabolic functioning of the human body. The current salt consumption pattern is way more than the recommended dietary allowance (RDA) of 2 g of sodium which is equivalent to 5 gram of salt per day. The current global average of sodium intake stands at 10.8 gram per day. Processed foods significantly contribute to about 75% of dietary salt consumption. Excessive dietary intake of sodium leads to an increased risk of hypertension, gastric cancer, obesity, osteoporosis, kidney, and cardiovascular diseases. We have developed the designer salt with low level of NaCl (50%) by replacing with other salt containing essential minerals required for the body. The designer salt has significantly faster dissolution (within 8 seconds) and also have high saltiness perception and maximum of 86% sodium reduction without affecting the organoleptic quality.



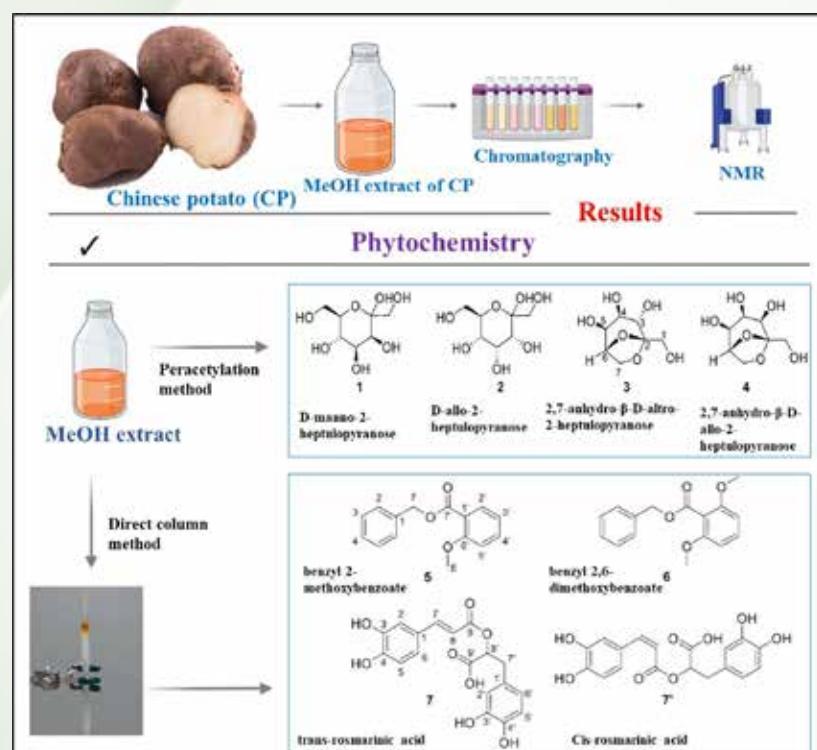
Reference

Drying Technology 2025, 1-13.

Identification of seven-carbon sugars and rosmarinic acid from the methanolic extract of Chinese potato (*Plectranthus rotundifolius*)

Dr. Reshma M.V.

Chinese potato potatoes, which are traditionally incorporated into the culinary practices of Southern India, are increasingly recognized for their potential nutritional and therapeutic value. Despite their widespread use, the phytochemical composition of this tuber remains poorly characterized. In this study, we conducted a detailed phytochemical investigation of the methanolic extract of Chinese potato, leading to the identification of unique bioactive constituents. Structural elucidation using comprehensive two-dimensional nuclear magnetic resonance (2D NMR) spectroscopy confirmed the presence of seven-carbon (C7) sugars, rosmarinic acid, and benzyl benzoate derivatives. Additionally, 1D nOe irradiation of selected peaks were employed to establish the stereochemistry of the isolated C7 sugars. Quantitative analysis via high-performance liquid chromatography (HPLC) revealed that rosmarinic acid accounts for $4.80 \pm 0.02\%$ of the total extract. These findings provide new insights into the phytochemical profile of Chinese potatoes and underscore their potential as a source of nutraceutical compounds with functional health benefits.



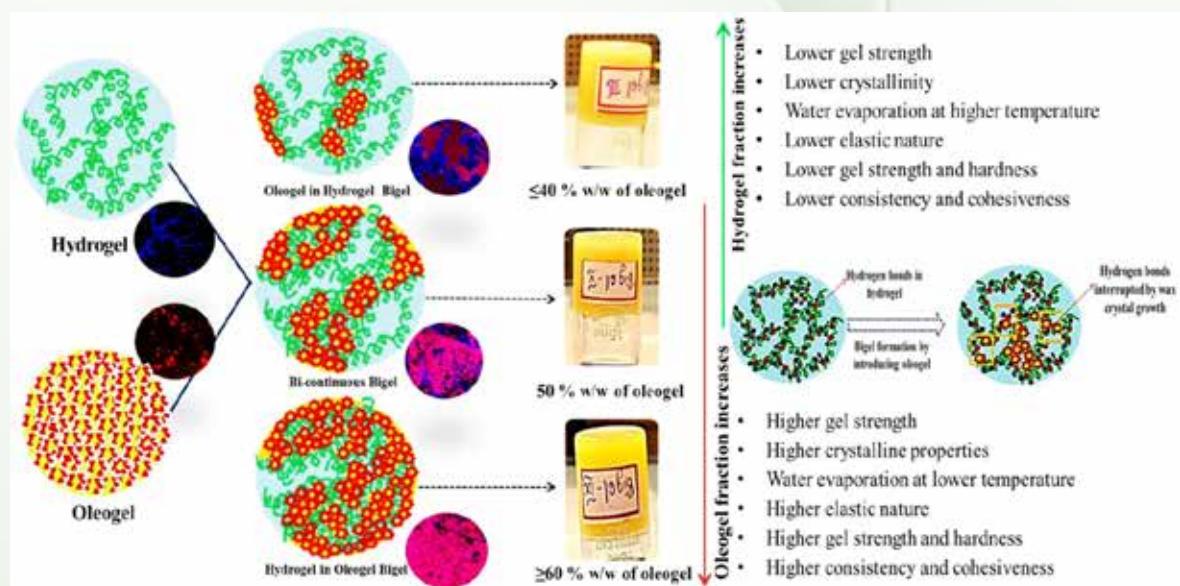
Reference:

Food and Humanity 2025. DOI:10.1016/j.foohum.2025.100619.

High molecular oleogelator (HMOG) based bigels for food applications: Soft matter and Molecular gastronomy approach

Dr. P. Nisha

Application of edible soft gel systems as fat replacers in various food products such as bakery products, meat products, chocolate etc are of great market value and of consumer demand. Therefore, a health fat substitute with improved nutritional profile devoid of saturated and trans fats are always in high demand. Oleogels using high molecular weight oleogelators (HMOGs) such as polysaccharides and proteins offer potential candidate as traditional hard stock replacers (vanaspatti, animal fats etc). The interaction between the main building blocks of foods (polysaccharides, proteins and lipids) determine texture and flow behaviour, how food is perceived in the mouth and digested in the gastrointestinal tract and molecular gastronomy as a whole. As a part of our ongoing research on understanding the structure function relationship of biopolymer based gels through the lens of soft matter and molecular gastronomy approach we are focusing on developing emulgel and oleogel for food applications as fat replacers using HMOGs. The interfacial interactions and microstructural properties of pectin based emulgel systems were analysed and the rheological, textural and microstructural properties were correlated as a function of gelator concentration. The process can be modified further to deliver hydrophilic and lipophilic compounds of nutritionally important and bioactives phytochemicals with health benefits (vitamins, bioactives etc).



Reference:

Biomacromolecules, doi.org/10.1021/acs.biomac.4c00959

Bioassay-Guided Isolation of Active Constituents from Indian Medicinal Plants

Dr. A Kumaran

A series of bioassay-guided investigations were conducted to isolate pharmacologically active constituents from selected Indian medicinal plants with traditional therapeutic relevance. From *Cassia auriculata*, flavone-C-glycosides lucenin-II and stellarin-II were identified as potential phosphodiesterase-5 (PDE5) inhibitors through in vitro, docking, and molecular dynamics studies. *Baliospermum montanum* yielded afzelechin-based flavan dimers from its ethyl acetate leaf fraction, which showed dual inhibition of COX-2/15-LOX and nitric oxide production in LPS-stimulated macrophages. In *Sphaeranthus indicus*, 3,5-Di-O-caffeoylequinic acid was isolated as a potent 5 α -reductase inhibitor, surpassing finasteride, and also exhibited strong antioxidant properties—supporting its use against benign prostatic hyperplasia. Anti-inflammatory flavonoids apigenin-7-O- β -D-glucuronide and diosmetin-7-O- β -D-glucuronide were isolated from *Cardiospermum halicacabum*, with diosmetin derivative significantly suppressing NO, ROS, and pro-inflammatory cytokines. Lastly, *Cassia mimosoides* was shown to possess significant antidiabetic properties, with isolated flavonoids such as isoorientin and diosmetin demonstrating DPP-IV and α -glucosidase inhibition, improved glucose uptake, and antiglycation activity. These studies validate traditional claims and reveal promising phytochemicals with potential for development into therapeutic agents targeting inflammation, metabolic, and endocrine disorders.



Cassia auriculata
Flavone-C-glycosides (lucenin-II, stellarin-II) identified as PDE5 inhibitors



Baliospermum montanum
Afzelechin-based flavan dimers as COX-2/15-LOX and nitric oxide inhibitors



Sphaeranthus indicus
3,5-Di-O-caffeoylequinic acid isolated as a 5 α -reductase inhibitor



Cardiospermum halicacabum
Flavonoids (apigenin-7-O- β -D-glucuronide, diosmetin-7-O- β -D-glucuronide)



Cassia mimosoides
Flavonoids (isoorientin, diosmetin) as DPP-IV and α -glucosidase inhibitors

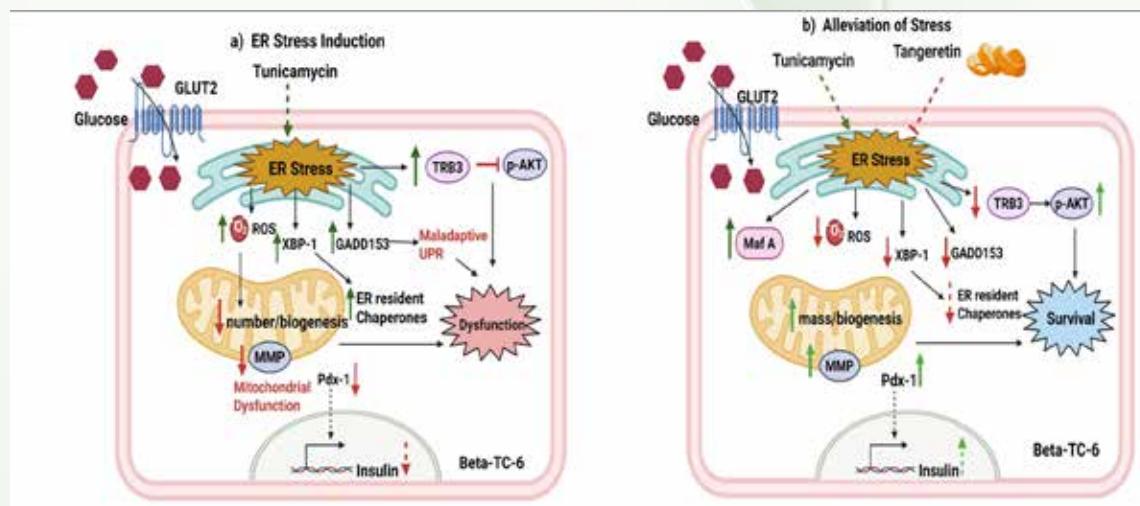
References:

1. Journal of Biomolecular Structure and Dynamics. doi: 10.1080/07391102.2024.2431659
2. South African Journal of Botany, 172, 567-578. doi: 10.1016/j.sajb.2024.07.060
3. Plant Foods for Human Nutrition, 1-7. doi: 10.1007/s11130-024-01226-2

Enhancement of pancreatic Beta-TC-6 function by Tangeretin through the amelioration of tunicamycin-induced cellular perturbations in pancreatic beta cells

Dr. P Jayamurthy

Pancreatic beta cell dysfunction, driven largely by endoplasmic reticulum (ER) stress, plays a key role in diabetes progression. This study evaluated the protective effects of tangeretin, a citrus-derived pentamethoxyflavone, against ER stress-induced beta cell damage using Beta-TC-6 cell lines. ER stress was pharmacologically induced using tunicamycin, which elevated intracellular ROS, impaired mitochondrial biogenesis and membrane potential, and upregulated unfolded protein response (UPR) markers such as XBP-1, GADD153, and ER chaperones. Tangeretin treatment significantly reduced ROS levels, restored mitochondrial function, and downregulated key ER stress markers. Although GLUT2 expression remained unaffected, tangeretin reversed tunicamycin-induced changes in Pdx-1, TRB3, and p-Akt expression, promoting beta cell survival and signaling. While tunicamycin markedly suppressed insulin secretion, tangeretin showed a modest improvement in insulin levels. These findings suggest that tangeretin alleviates ER stress and improves beta cell health, offering a potential therapeutic approach for diabetes management by targeting cellular stress and mitochondrial dysfunction.

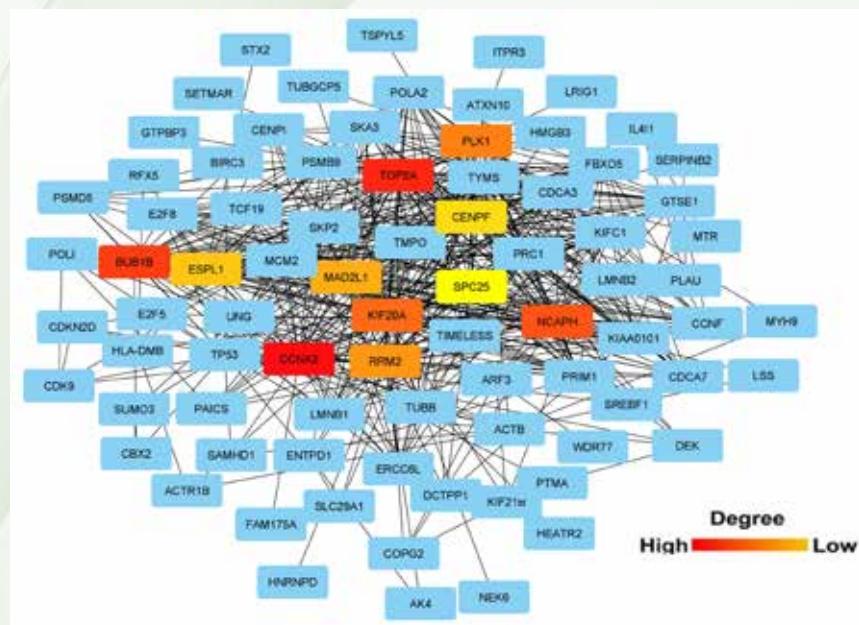


Reference:

Molecular Biology Reports 2024, 51, 43.

Transcriptomic approach for elucidating the anticancer mechanism of the phytomolecule epoxyazadiradione (EAD)

Dr. Priya S.



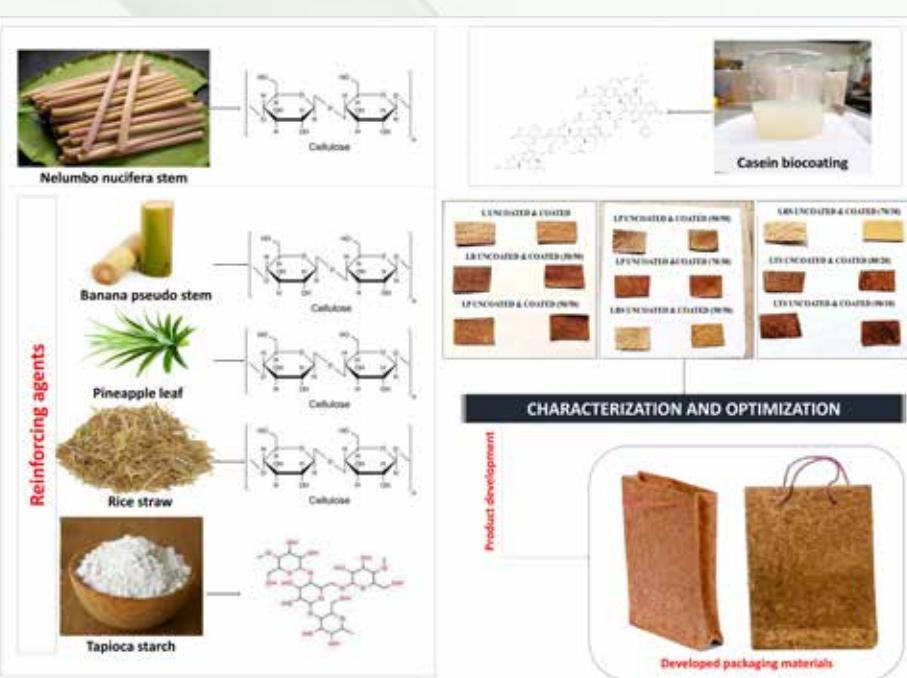
Reference:

Gene 2024, 930, 148814.

Developing sustainable packaging alternatives for plastic carry bags: Utilizing reinforced lotus fiber with casein bio-coating

Dr. Anjineyulu Kothakota

Lotus, an underutilized aquatic plant with strong natural fibres, was explored as a sustainable raw material for developing biodegradable packaging. This study combined lotus fibre with banana stem, pineapple leaf, and rice straw fibres, using tapioca starch as a binder. To enhance performance, a casein-based bio-coating was applied. Comprehensive analyses were conducted to assess mechanical, thermal, structural, water barrier, and biodegradability properties. Among all samples, those containing banana fibre (LB) exhibited the highest tensile strength (12.81 MPa) and bursting strength (7.09 KPa). The casein coating significantly improved mechanical strength and water resistance, with contact angles ranging from 72.3° to 92.3°, highest in pineapple fibre-based samples. FTIR analysis confirmed strong interactions among fibres, while SEM images demonstrated the coating's effect on surface morphology. Thermogravimetric analysis indicated improved thermal stability, and a high crystallinity index in LB samples supported their superior mechanical performance. Soil burial tests showed significant biodegradation within 20 days, further accelerated by the bio-coating. Additionally, the material could be easily molded into carry bags, demonstrating its potential as an eco-friendly alternative to plastic packaging.



Reference:

Sustainable Chemistry and Pharmacy, 2024, 39, 101564.

Sustainable ingredients for Clean label food products: Tree nut oleosomes as a sustainable ingredient for food emulsion systems.

Dr. K. Vasanth Ragavan

By products derived from the industrial processing of tree nuts are seldom upcycled. Virgin coconut meal (VCM), a by-product of coconut milk production, is often discarded or used as animal feed, despite being a rich source of dietary fiber, protein, and residual oil. In the coconut endosperm, oil is stored as oleosomes, naturally emulsified structures composed of a triacylglycerol core stabilized by oleosin proteins and phospholipids. In this study, we developed a green and scalable method for extracting oleosomes using response surface methodology and evaluated their potential as a base ingredient in plant-based mayonnaise. This approach eliminates the need for synthetic or animal-based emulsifiers such as egg yolk. The formulated mayonnaise showed improved sensory characteristics and rheological properties compared to conventional egg-based mayonnaise. This process not only adds value to coconut processing by-products but also supports clean-label product development by offering a natural emulsifier suitable for the rapidly growing plant-based food sector. Furthermore, the extraction method can be extended to other cold-pressed oilseed meals, promoting waste valorization and the development of functional food ingredients.



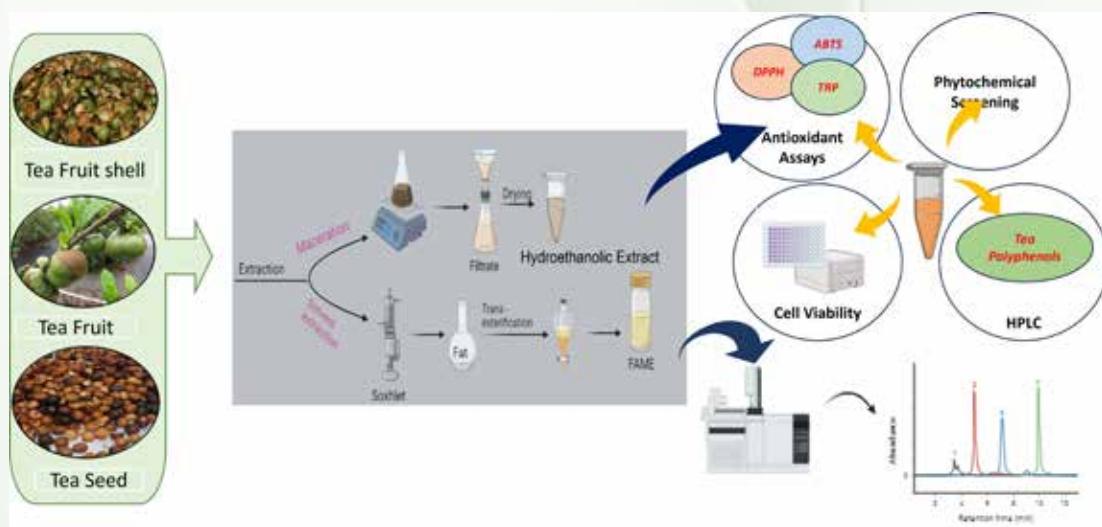
Reference:

Sustainable Food Technol., 2025, Advance Article <https://doi.org/10.1039/D5FB00112A>

Exploratory studies of Tea seed & Tea fruit shell *Camellia sinensis* (L) O. Kuntze for their Value addition

Dr. Tripti Mishra

The present study planned to explore the opportunities associated with the tea seeds and tea fruit shells in terms of their utilization, as seeds are of no economic importance in tea plantations. As per the reports, tea growers shifted towards vegetative reproduction, and since then, there has been a generation of tea seeds and commercial tea plants grown in tea plantations for the leaves, which are unable to find any appropriate use. Tea seeds have previous reports of their oil analysis, but there is no report on the utilization of tea fruit shells. The current studies indicated that fruit shells are more useful than tea seeds, considering their bioactives and associated medicinal potential. The current study confirmed that tea fruit shell is highly rich in polyphenolic content, and its antioxidant activity is similar to the standards like gallic acid and trolox used in the DPPH and total reducing power assays. In addition, fruit shells also showed the presence of an exemplary quantity of catechins, which are absent in the tea seeds. Fatty acid profiling of tea seed and its shell also has remarkable differences in the fat constituents, as the fruit shell showed the presence of an adequate quantity of Myristic and lauric acid. Hence, the present study confirmed that despite being waste generated from tea plantations, the tea fruit shell has vast opportunities to work on accessing its medicinal potential in the future.



Reference:

Industrial Crops and Products 2024, 219, 119086.

Sustainable Energy





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(Senior Principal Scientist)



Dr. Rakhi R. B.
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Dr. Nishanth K.G.
(Principal Scientist)



Dr. Sreejith Shankar P.
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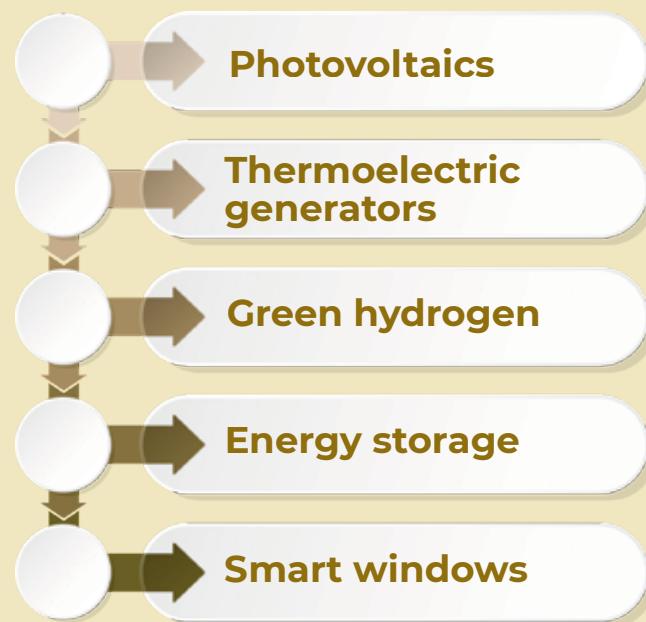
Dr. Suraj Soman
(Senior Scientist)



Dr. Adersh Asok
(Senior Scientist)

The global energy landscape is evolving rapidly, pushed by the pressing need to fight climate change, cut emissions, and build a sustainable energy future. In response, CSIR-NIIST launched the Centre for Sustainable Energy Technologies (C-SET), a division conceived by Director Dr. C. Anandharamakrishnan. Officially inaugurated on July 28, 2023, by Dr. V. K. Saraswat of NITI Aayog, C-SET is set to lead advances in sustainable energy. The centre tackles all facets of energy—from generation and storage to conversion, conservation, and management. Its team of 8 scientists and 48 research staff, including Ph.D. scholars, focuses on diverse technologies: dye-sensitized solar cells for indoor lighting, perovskite photovoltaics, agrivoltaics, building-integrated photovoltaics (BIPV), and smart windows with electrochromic and thermochromic features. C-SET also works on thermoelectric waste heat recovery, supercapacitor storage, efficient OLED lighting, electrode materials for electrolyzers, green ammonia, clean water from textile wastewater, and hydrogen leak detectors. A major goal is creating an indigenous supply chain for materials and equipment. In 2024-25, C-SET managed 13 government grants, 10 CSIR projects, 3 industry-sponsored efforts, and 3 in-house R&D initiatives. Collaboration is central, partnering with industry leaders like GAIL, Tata Motors, and Saint-Gobain, and international groups such as SUPSI (Switzerland) and LRCS-CNRS (France). Government agencies including DST, SERB, MeitY, ANERT, DMRL, and BRNS also support the centre's work. With innovation and strong partnerships at its core, C-SET is advancing sustainable energy solutions for India and beyond.

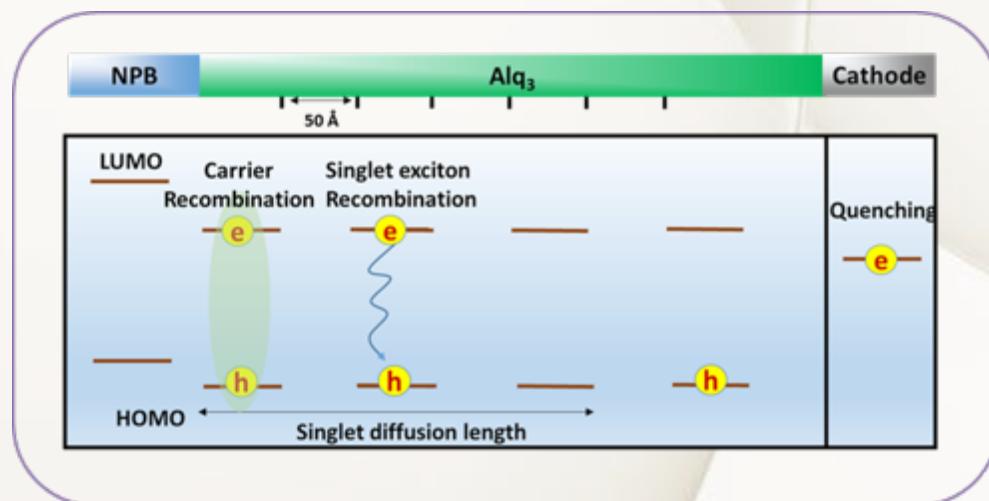
Focus Areas



Investigating the singlet and triplet exciton recombination zone in organic light emitting diodes: Insights into field dependence, economic material usage and efficiency roll off

Dr. K. N. Narayanan Unni

The optimum extent of the emissive layer (EML) in an organic light-emitting diode (OLED) has a critical influence on the device efficiency. It is required to have an optimum thickness of the EML enabling maximum exciton harvesting without sacrificing carriers towards non-recombination current, nor allowing an increased device resistance. Herein, the mapping of singlet and triplet exciton diffusion was done in an OLED by the spatial deployment of luminescent probes and studying the corresponding electroluminescence (EL) spectrum. The singlet and triplet emission zones in an EML of 8-hydroxyquinoline aluminum (Alq_3), were mapped by inserting a fluorescent probe of 4-(Dicyanomethylene)-2-tert-butyl-6-(1,1,7,7-tetramethyljulolidin-4-yl-vinyl)-4H-pyran (DCJTB) or a phosphorescent probe of platinum octaethylporphyrin (PtOEP), at different distances from the hole transport layer (HTL)/EML interface. The influence of the electric field on the exciton recombination was also studied.



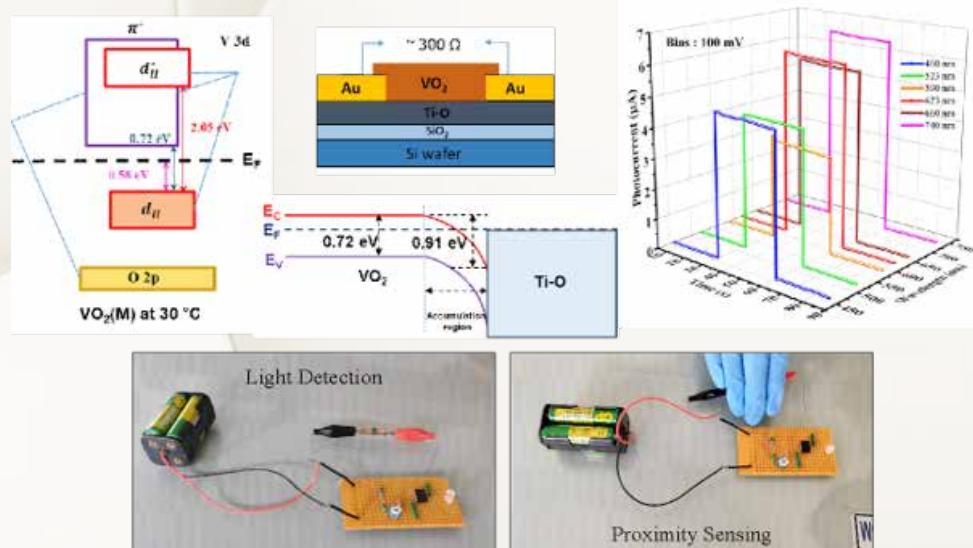
Reference:

Physica B: Condensed Matter 2025, 699, 416835

A Unique VO_2 Heterojunction-Based Ultrafast Photodetector Configuration for Exceptional Quantum Efficiency and Superior Responsivity

Dr. Biwapiya Deb

A novel metal–semiconductor–metal (MSM) photodetector architecture based on a VO_2 /oxygenated-Ti (Ti-O) heterojunction has been demonstrated, leveraging the broadband absorbance of VO_2 and its engineered interface with Ti-O to achieve superior visible light detection. VO_2 acts as an efficient photon absorber, while band bending at the VO_2 /Ti-O interface promotes interfacial charge separation, reducing carrier recombination and enabling efficient electron transfer to Ti-O. This architecture overcomes traditional active-layer size constraints, achieving remarkable performance metrics including a photocurrent density of $465 \mu\text{A}/\text{cm}^2$ and detectivity of 3.2×10^{10} Jones at 800 mV bias under 590 nm illumination. A peak responsivity of 2.54 A/W and external quantum efficiency of 534% was achieved. High-purity VO_2 films were deposited via magnetron sputtering and oxygen annealing, confirmed through Raman mapping and XPS analysis. The design also supports self-biased operation, showing a 1000-fold photocurrent enhancement over conventional MSM devices at 100 mV bias, and demonstrated rapid millisecond-scale response suited for low-intensity visible light and proximity sensing applications.



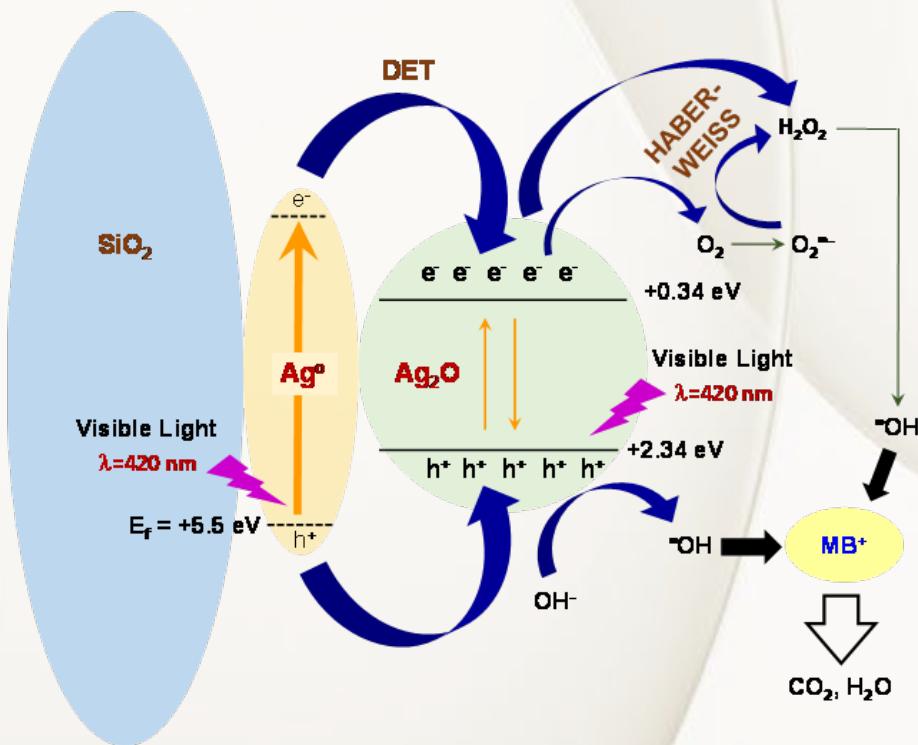
Reference:

ACS Appl. Electron. Mater. 2024, 6, 6982–6993

Integration of surface plasmon resonance and photocatalytic activity with Fenton-like advanced oxidation process for effective regeneration of SiO_2 -Ag nanocomposite in basic dye removal via adsorption

Dr. Satyajit Shukla

Existing regeneration techniques, utilized for the silica (SiO_2)-based organic dye adsorbents, are associated with several limitations. Hence, the regeneration of SiO_2 -Ag (10 wt%) nanocomposite, as a dye adsorbent, has been demonstrated here via the integration of surface plasmon resonance (SPR) of AgO and photocatalytic activity (PCA) of Ag_2O with the Fenton-like advanced oxidation process (AOP) under the visible light and solar irradiations to obtain the regeneration efficiency (RE) values of 65 % and 102 %. The addition of H_2O_2 and $\text{S}_2\text{O}_8^{2-}$ under the visible light irradiation is noted to increase the RE to 116 % and 123 %; while, that under the solar radiation, it is noted to increase the RE to 126 %. The regeneration of SiO_2 -Ag(10 wt%) nanocomposite obtained via the integration of weak SPR effect with the Fenton-like AOP under the visible light irradiation is as effective as the integration of PCA with Fenton-like AOP under the solar irradiation.



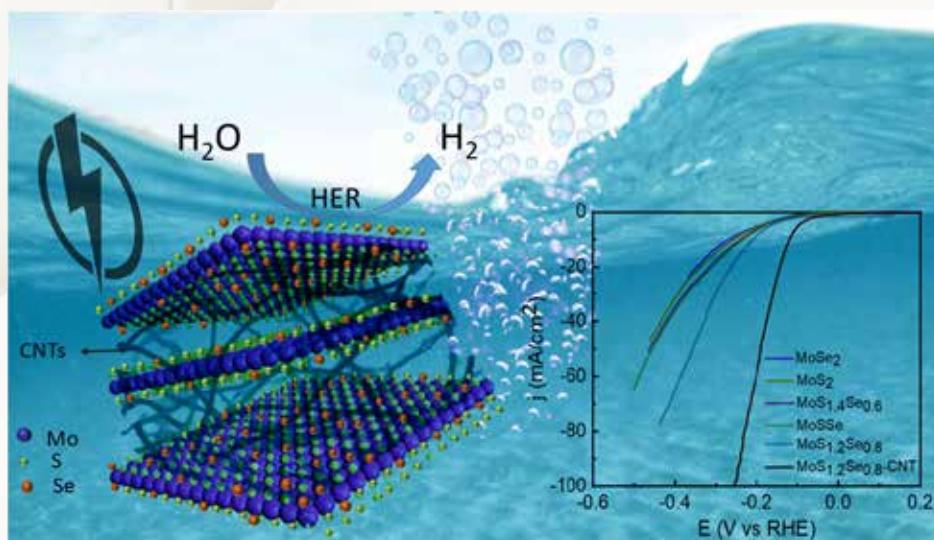
Reference

Chem. Eng. Sci. 2025, 312, 121649

Engineering MoS_2 -Based Catalysts for Superior Electrochemical Hydrogen Production

Dr. Rakhi R. B.

Molybdenum disulfide (MoS_2), a transition metal dichalcogenide, is recognized for its favorable hydrogen adsorption properties, particularly at its sulfided edges. The research presents a comprehensive investigation into MoS_2 -based electrocatalysts for the hydrogen evolution reaction (HER), a key process in sustainable hydrogen production via water electrolysis. MoS_2 nanomaterials were synthesized using hydrothermal methods, and performance enhancements were achieved through various modifications. Incorporation of low amounts of Pt significantly improved HER activity, reducing the overpotential to 200 mV at 10 mA/cm². A ternary MoS_2 /CNT/MXene composite achieved even better performance with an overpotential of 130 mV and a Tafel slope of 150 mV/dec. Anionic substitution with selenium ($\text{MoS}_{1.2}\text{Se}_{0.8}$) further improved catalytic efficiency, delivering 10 mA/cm² at 211 mV with enhanced electrochemical surface area. CNT integration further reduced the overpotential to 118 mV. Binder-free electrodes, including MoS_2 and $\text{MnO}_2/\text{MoS}_2$ heterostructures grown on nickel foam, demonstrated excellent bifunctional catalytic activity in both acidic and alkaline media. A full-cell electrolyzer using $\text{MnO}_2/\text{MoS}_2$ exhibited a low overall cell voltage of 1.54 V, and sustained operation even in simulated seawater for up to 72 hours. These results establish MoS_2 -based materials as viable, low-cost, and scalable electrocatalysts for green hydrogen generation.



References

International Journal of Hydrogen Energy 2025, 117, 73
Applied Surface Science 2025, 681, 161614

Even Solar Sharing Agrivoltaics Technology for Precision Carbon-Neutral Farming

Dr. Adersh Asok

Agrivoltaics (AV) integrates farming with solar power generation, supporting India's goal to double farmers' income. CSIR-NIIST has developed Even Solar Sharing (ESS) AV technology, currently at TRL-7, with field trials underway: a 10 kWp protected cultivation (CSIR-NIIST) and 5 kWp open-field system (CSIR-IIP). ESS-AV addresses the need for precise light management, enabling cultivation of shade-intolerant commercial crops—a key limitation in conventional AV systems. It features tunable ray spreading and spectral conversion, tailored to crop height and Photosynthetic Photon Flux Density (PPFD) needs. The system boosts power output by extending photovoltaic coverage, while reducing crop evapotranspiration and thermal stress, improving plant health and land productivity. Its adjustable pole height allows retrofitting to existing PV installations, integration with greenhouses, and deployment in Building Integrated Agrivoltaics (BIAV) as a multifunctional rooftop alternative. ESS-AV offers a scalable, adaptable solution for optimized land use, enhanced crop yield, and increased clean energy generation—paving the way for sustainable, carbon-neutral agriculture.



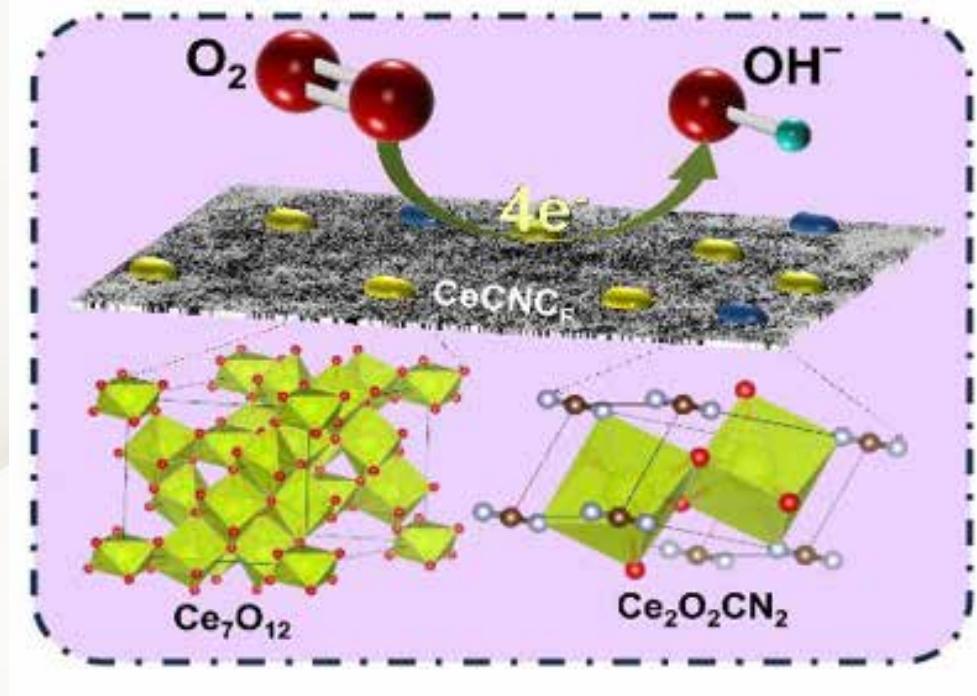
Reference Patents:

- 1) Patent Application No. 202311083345; Ref. No.: 0273NF2024; 28th November 2024.
- 2) Patent Application No. 202311083345; Filed on 6th December 2023.

A non-precious metal-based hybrid electrocatalyst, CeCNCF for oxygen reduction reaction

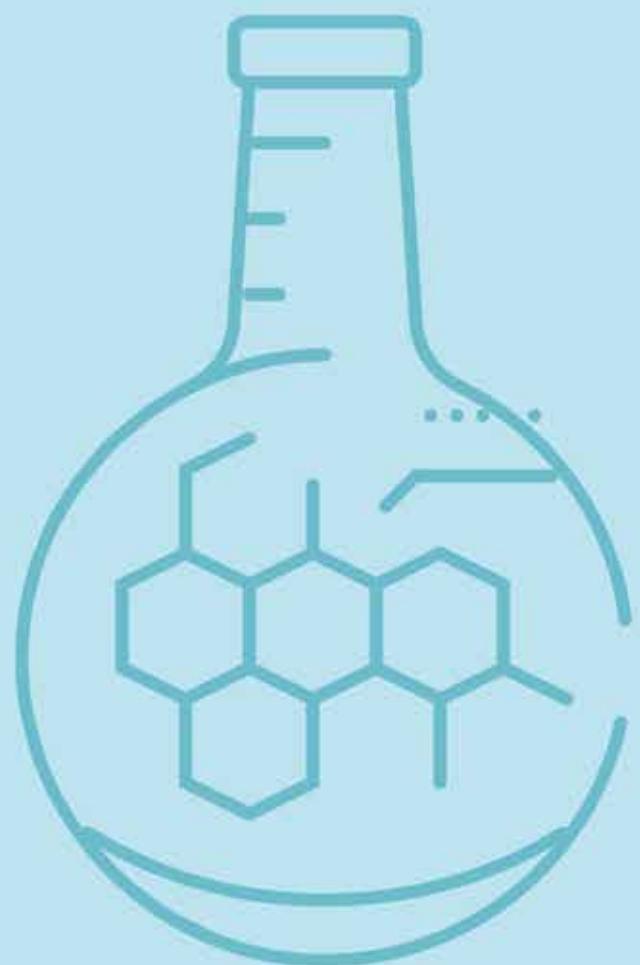
Dr. Nishanth K.G.

The main focus of my research is the development of electrocatalysts for sustainable energy technologies. Electrocatalysts are essential in energy conversion processes, such as fuel cells and electrolyzers. They enhance the efficiency and kinetics of electrochemical reactions, which is vital for creating sustainable energy solutions. The research emphasizes novel materials, design strategies, and various applications of electrocatalysts. Additionally, the group also works on developing innovative electrode materials for the electrochemical synthesis of ammonia and urea. The production of green ammonia and urea helps minimize CO_2 emissions, contributing to a cleaner environment. Green urea, in particular, serves as a sustainable fertilizer solution, supporting agriculture while reducing its environmental impact.



Reference:

Sustainable Energy Fuels, 2025, 9, 778



Chemical Sciences





Dr. Hareesh U. S.
(Chief Scientist & Head)



Dr. Suresh C. H.
(Chief Scientist)



Dr. Karunakaran V.
(Senior Principal Scientist)



Dr. Joshy Joseph
(Senior Principal Scientist)



Dr. Vijayakumar C.
(Senior Principal Scientist)



Dr. Ravi Shankar L.
(Senior Principal Scientist)



Dr. Sasidhar B. S.
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Dr. Sunil Varughese
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Dr. Praveen V. K.
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Dr. Jubi John
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Mrs. Viji S.
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Mrs. Saumini Mathew
(Senior Technical Officer-2)

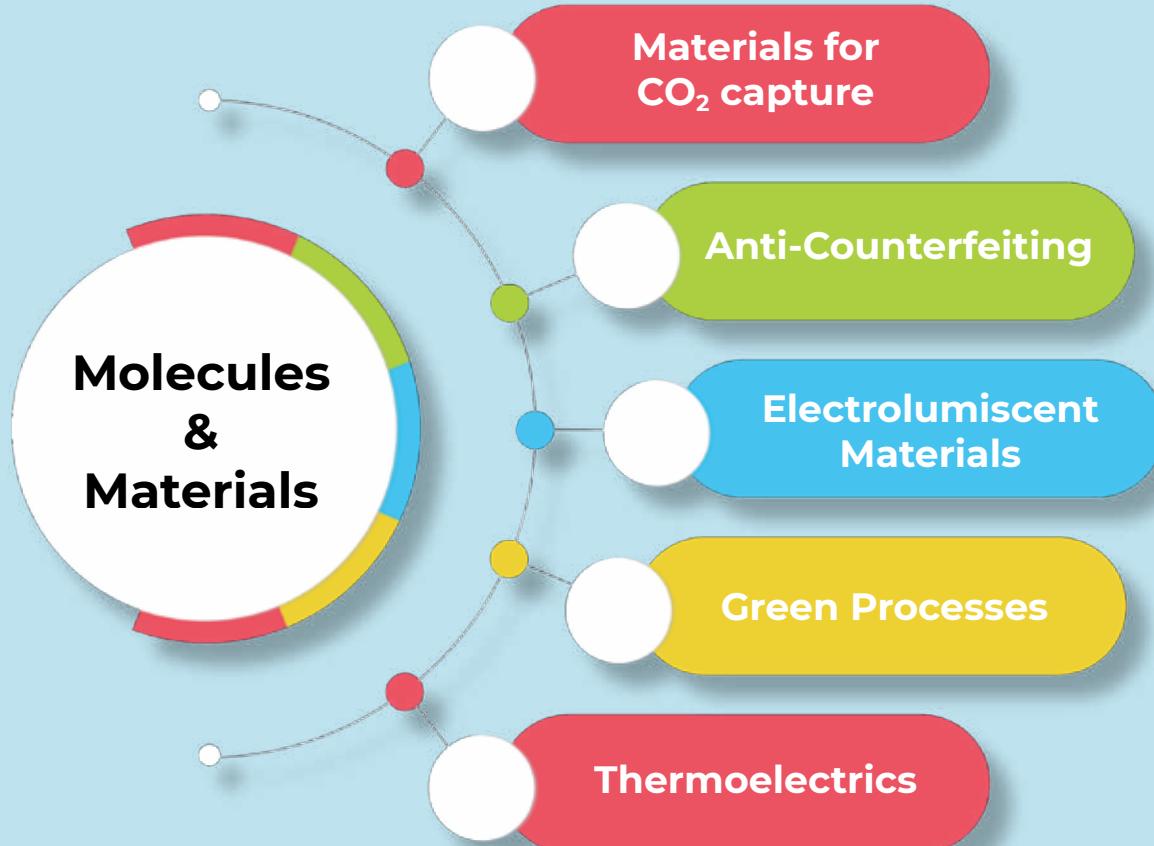


Mr. Kiran Mohan
(Senior Technical Officer-2)

As CSIR-NIIST celebrates its Golden Jubilee, the Chemical Sciences and Technology Division (CSTD) continues to embrace emerging opportunities, foster cross-disciplinary innovation, and nurture the next generation of scientific leaders committed to a sustainable future. CSTD drives cutting-edge research across organic and medicinal chemistry, materials science, photonics, and green synthesis. Its work spans from developing phytochemical-based drug leads and scalable APIs to advancing crystal engineering for optimized drug forms. In photonics, the division explores photofunctional materials, ultrafast spectroscopy, fluorescent security inks, perovskite nanocrystals, and multifunctional materials for sensing and optoelectronics.

Over the decades, CSTD has earned national and global recognition through transformative research, technological innovation, and human resource development. With one of the largest PhD cohorts at the institute and numerous accolades to its credit, the division stands as a beacon of scientific excellence and a key force shaping the future of chemical sciences.

Focus Areas

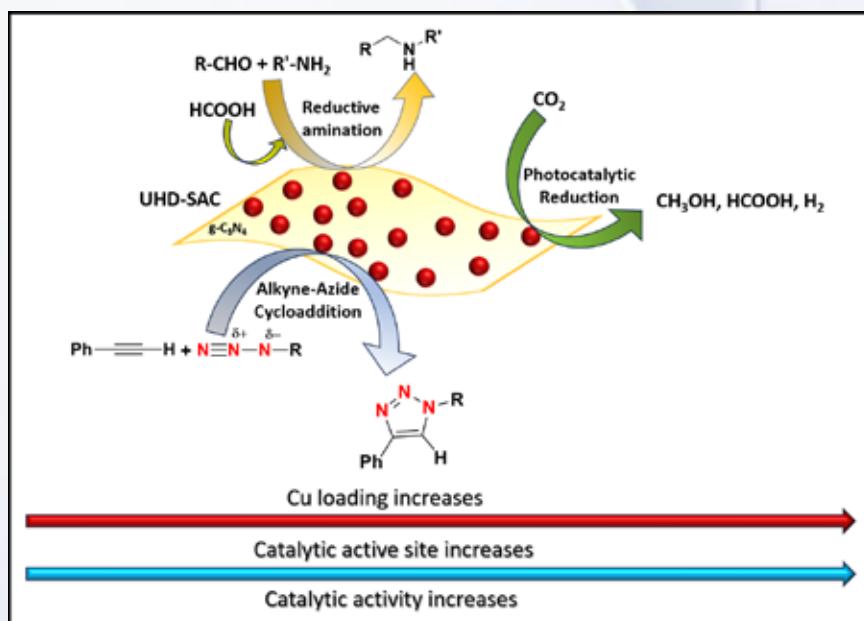


High-Performance Atomically Dispersed Metal Catalysts (ADMCs) for Sustainable Chemical Synthesis

Dr. U. S. Hareesh

At CSIR-NIIST, significant strides have been made in the development of high-performance Atomically Dispersed Metal Catalysts (ADMCs) utilizing non-precious copper (Cu) atoms anchored onto a two-dimensional graphitic carbon nitride ($\text{g-C}_3\text{N}_4$) matrix by the group of Dr. Hareesh. In these systems, the Cu centres acquire partial positive charges through electron transfer to the $\text{g-C}_3\text{N}_4$ support. This unique electronic structure fine-tunes interactions with substrates and reaction intermediates, enhancing catalytic selectivity, suppressing undesirable side reactions, and promoting both high activity and stability.

The Cu-based ADMCs developed at CSIR-NIIST have demonstrated remarkable performance across a broad spectrum of organic transformations, including alkyne–azide cycloaddition, reductive amination, and the oxidation of amines. Furthermore, these catalysts have exhibited significant activity in photocatalytic CO_2 reduction under visible light, underscoring their versatility. Combining high metal loading capacity with cost-effectiveness, durability, and scalability, these catalysts hold immense promise for industrial applications. By replacing precious metals with earth-abundant copper, this approach offers a sustainable and economically viable alternative for catalysis in pharmaceutical synthesis, advanced materials development, and environmental chemistry. Ultimately, the development of Cu-based SACs paves the way for designing low-cost, scalable, and eco-friendly catalysts, contributing meaningfully to the broader vision of sustainable chemical synthesis and energy-related applications.



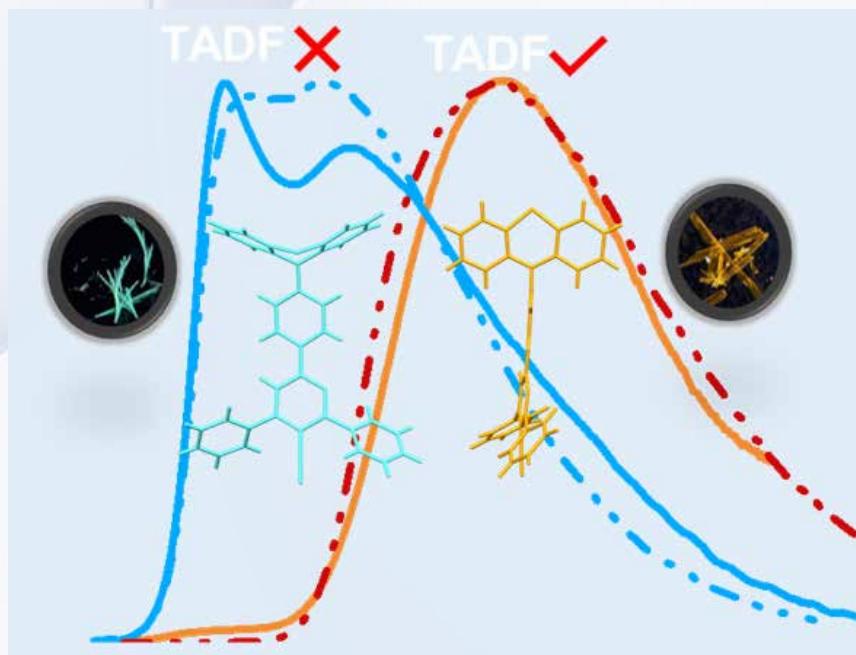
Reference:

ACS Appl. Nano Mater. 2025, 8, 1214

Development of a library of phenothiazine based, donor- π -acceptor type TADF emitters

Dr. Joshy Joseph

Phenothiazine-based donor- π -acceptor (D- π -A) systems are promising materials for tunable optoelectronic applications. Dr. Joshy Joseph's group has developed a library of such emitters using phenothiazine as the donor and nicotinonitrile derivatives as acceptors, exhibiting switchable conformations—quasi-axial and quasi-equatorial—that impact their photophysical properties. Single-crystal analysis confirmed both conformers, including polymorphs, showing emission profiles from cyan to orange. Some conformers exhibited thermally activated delayed fluorescence (TADF), with emission dependent on molecular packing and external stimuli. Theoretical studies showed that the singlet-triplet energy gap (ΔE_{ST}) varies with conformation, and low energy barriers allow ambient interconversion. Several compounds demonstrated mechanochromic behavior, changing emission color under mechanical stress, useful for security and display applications. Selected emitters were used in solution-processed OLEDs, achieving high luminance and efficiency. Notably, single-molecule white OLEDs were realized by adjusting doping concentrations, offering good color rendering and external quantum efficiency. This work highlights the potential of conformationally dynamic phenothiazine-based D- π -A systems in creating responsive TADF materials for advanced optoelectronic devices.



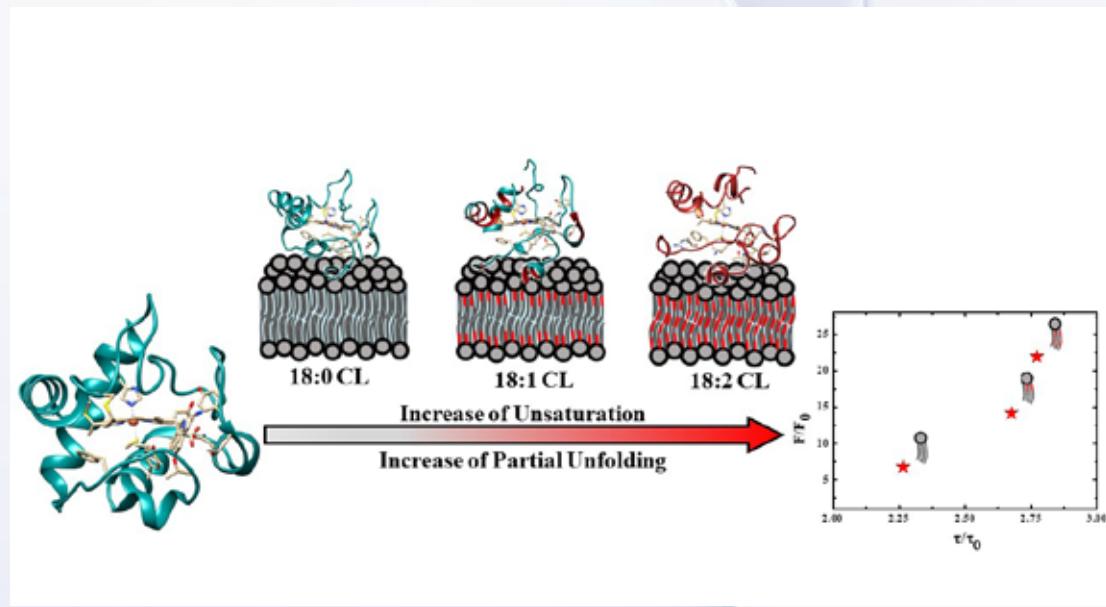
Reference

Chemical Science, 2025 (Accepted article)

Significance of Double Bond in the Acyl Chain of Cardiolipin Revealed by Partial Unfolding Dynamics of Cytochrome c Using Femtosecond Transient Absorption Spectroscopy

Dr. Karunakaran Venugopal

Cytochrome c (Cyt c) released from mitochondria acts as a trigger for the onset of apoptosis, in which the double bond of cardiolipin (CL) is oxidized upon interaction with Cyt c. Dr. Karunakaran Venugopal and his group have worked on understanding the interaction dynamics of Cyt c with the double bond of CL. For this, CLs having acyl chains with systematic increase of number of double bonds of 0 (18:0 CL), 1 (18:1 CL) and 2 (18:2 CL) were complexed with Cyt c and studied their excited state dynamics using femtosecond time-resolved pump-probe spectroscopy. Steady-state and femtosecond transient absorption spectra revealed a systematic increase of partial unfolding of Cyt c with increase of double bond in CL by observing the enhanced fluorescence intensity and lifetime of tryptophan due to variation of resonance energy transfer and extended global conformational relaxation time constants. These studies reflect the significance of the occurrence of global conformational changes of Cyt c by structural modification near the double bond of CL in Cyt c-CL complex, which could be the prerequisites for apoptosis.



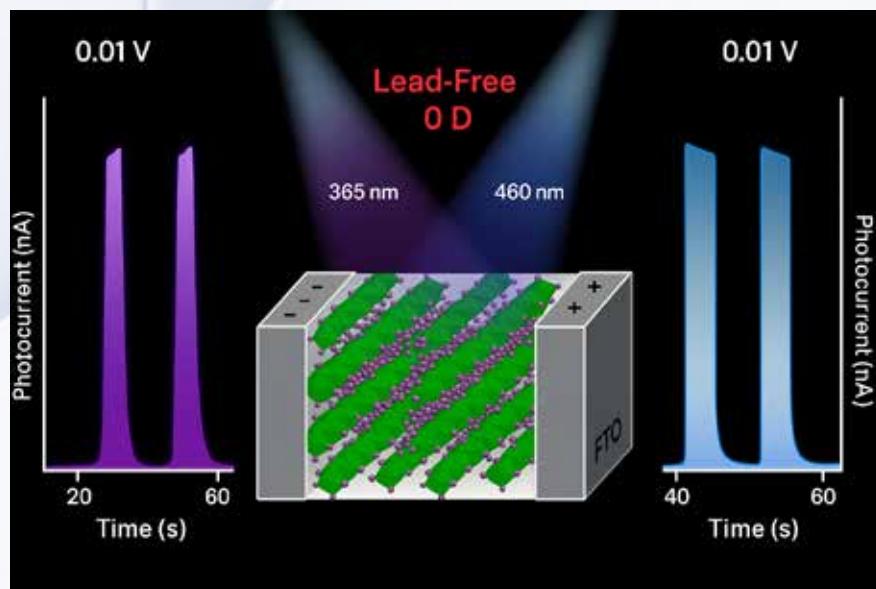
Reference:

J. Phys. Chem. B., 2024, 128, 11885

Advancing Lead-Free Halide Perovskites for Sustainable and High-Performance Optoelectronics

Dr. C. Vijayakumar

Dr. Vijayakumar's research group focuses on the development of lead-free halide perovskites as sustainable alternatives to traditional optoelectronic materials. These materials offer promising properties such as tunable bandgaps, high absorption coefficients, and solution-processability, while eliminating the environmental and health hazards associated with lead-based counterparts. They are actively engaged in designing and synthesizing novel perovskite compositions, particularly those incorporating bismuth and other non-toxic elements, with tailored dimensionality and structural motifs. A core aspect of this program involves probing the photophysical behavior of these materials—examining charge carrier dynamics, excitonic effects, and light-matter interactions—through advanced spectroscopic techniques. Parallel efforts are directed at understanding structure-property relationships, with an emphasis on how local crystal environments and molecular architecture influence electronic properties and device performance. Leveraging these insights, they engineer high-performance photodetectors targeting ultraviolet (UV) and deep ultraviolet (DUV) spectral regions. The recent breakthroughs include the development of dimethylamine bismuth iodide (DMABI), which demonstrates ultralow dark currents, high detectivity, and exceptional operational stability under ambient conditions. Moving forward, their research aims to expand the library of lead-free perovskite systems, improve device architectures, and enhance spectral selectivity and response speed, contributing to the advancement of next-generation optoelectronic technologies with a focus on environmental safety and functional excellence.



References:

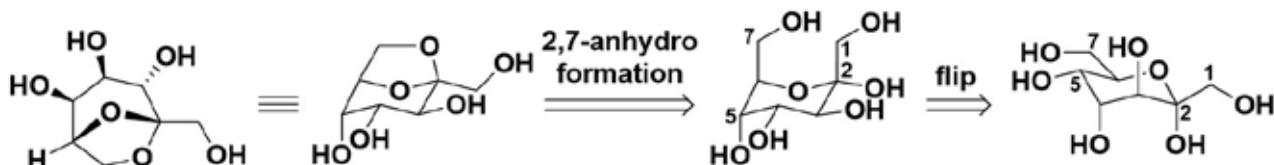
1. Chem. Mater. 2024, 36, 5912.
2. Adv. Funct. Mater. 2024, 34, 2304899.

Advancing Natural Products research through Synthetic Organic Chemistry

Dr. Ravi Shankar Lankalapalli

The research program led by Dr. Ravi Shankar Lankalapalli at CSIR-NIIST focuses on enhancing research on natural products through synthetic organic chemistry. A recent study applied on *Plectranthus rotundifolius* (Chinese potato), where retrosynthetic analysis led to the discovery of 7-carbon sugars. Central to this initiative is exploring polar and structurally complex natural compounds, emphasizing their isolation, structural elucidation, and bioactivity analysis. This work bridges natural and synthetic methodologies, offering dual benefits such as diverse bioactivities and synthesizing different targets from a common route. A key feature of these synthetic programs is the late-stage diversification of synthetic intermediates. Techniques like 2D NMR, peracetylation, and global deprotection are commonly used in the isolation and structure elucidation of natural products. The focus is on bioactive glycosides, such as Uttroside and its analogs, which target cancer and vaccine adjuvants. Selective transformations are conducted to produce both water-soluble and insoluble agents, demonstrating how synthetic modification can enhance therapeutic efficacy. In antiviral and antibacterial research, iminosugar derivatives, including KRN7000 analogs, have shown promising activity against dengue virus (DENV) and biofilms of *Streptococcus pyogenes* and *Proteus mirabilis*. Additional ongoing work includes synthesizing natural products in a diversity-oriented manner to create compound libraries.

Retrosynthetic analysis in structure elucidation of natural products:



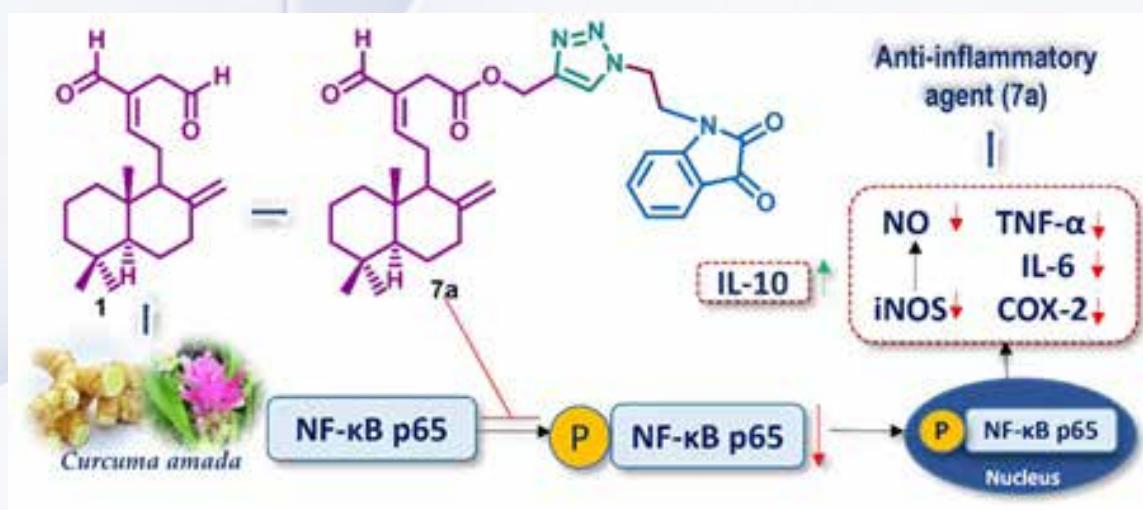
Reference:

Food and Humanity 2025, 4, 100619.

Pharmacophore-Guided Design and Discovery of Labdane-Derived Anti-Inflammatory Conjugates

Dr. Sasidhar B. S.

The group of Dr. Sasidhar has employed a ligand-based pharmacophoric approach to design and synthesize a library of novel semi-synthetic labdane-appended triazolyl isatins to discover potential anti-inflammatory agents. The anti-inflammatory efficacy of the derivatives was evaluated by their ability to inhibit the production of NO, TNF- α , and IL-6 in lipopolysaccharide-induced RAW264.7 macrophages. Our screening revealed that compound **7a** ((1-(2-(2,3-dioxoindolin-1-yl)ethyl)-1H-1,2,3-triazol-4-yl)methyl (E)-3-formyl-5-((1S,4aS,8aS)-5,5,8a-trimethyl-2-methylenedecahydronaphthalen-1-yl)pent-3-enoate) exhibited an anti-inflammatory effect (NO inhibition, $IC_{50} = 3.13 \mu\text{M}$), surpassing both the positive control indomethacin and the parent compound labdane dialdehyde. Notably, **7a** reduced the levels of the pro-inflammatory cytokines TNF- α and IL-6, while increasing the levels of the anti-inflammatory cytokine IL-10. Mechanistic studies revealed that **7a** downregulated the expression of COX-2 and iNOS by inhibiting the NF- κ B signalling pathway. In-silico molecular modelling studies on NF- κ B proteins support these findings, suggesting that **7a** is a promising candidate for developing into a potent anti-inflammatory clinical agent.



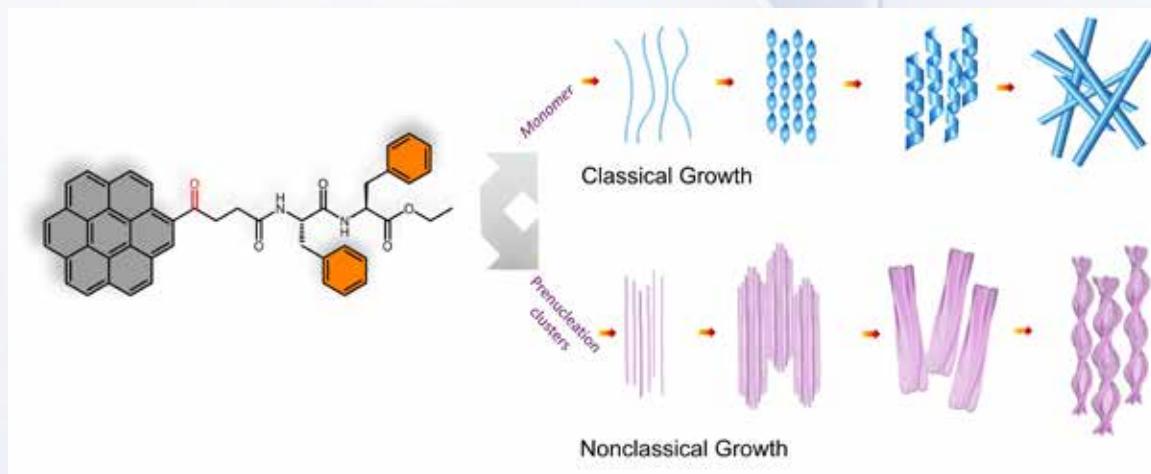
Reference:

ACS Medicinal Chemistry Letters, 2024, 15, 8, 1260–1268.
J. Agric. Food Chem. 2024, 72, 12, 6389–6401.

Shaping the Future of Smart Materials through Supramolecular Design

Dr. V. K. Praveen

Unlike traditional polymers, built from monomers linked by covalent bonds, supramolecular polymers are held together by non-covalent interactions, giving them a unique ability to self-assemble, adapt, and respond to their environment. Our research lies at the exciting frontier, where molecular interactions are not only understood but also engineered to behave with precision and purpose. Inspired by biological systems that masterfully regulate processes in space and time, we aim to mimic nature's elegance. Our goal is to achieve fine control over the length, dispersity, sequence, spatial arrangement, and functionality of supramolecular polymers, traits typically exclusive to biopolymers. By tuning both thermodynamic and kinetic energy landscapes, we are working to establish design principles that can transform how supramolecular materials are conceptualized and applied. Our work paves the way for the development of eco-friendly supramolecular plastics, intelligent packaging, and responsive coatings, materials that are not only functional but also sustainable and future-ready. In parallel, we are harnessing self-assembled soft materials as templates to synthesize ordered mesoporous metal–carbon materials for energy storage and conversion. At the intersection of chemistry, materials science, and nanotechnology, our research group strives to build a new class of adaptive, sustainable, and intelligent materials-inspired by nature, designed for the future.



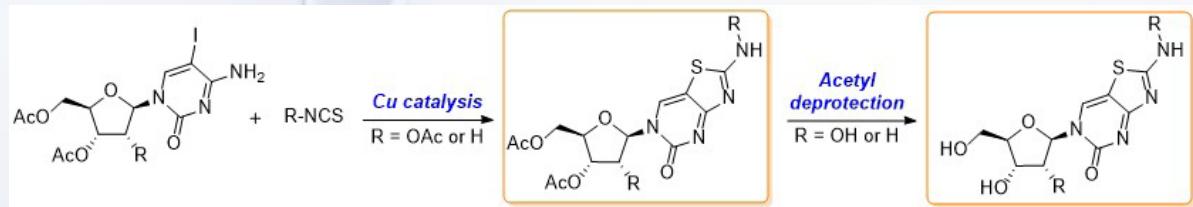
Reference

Small 2025, 21, 2405305.

Introducing a New Class of Bicyclic nucleoside analogues: Thiazolopyrimidine-Based Nucleosides

Dr. Jubi John

Bicyclic nucleoside analogues (BCNAs) are synthetic molecules engineered to resemble natural nucleosides, which play essential roles in DNA and RNA synthesis. Characterized by a distinctive structure featuring two fused rings—typically involving a pyrimidine moiety—these compounds exhibit improved stability and stronger binding to target enzymes. Due to their capacity to interfere with nucleic acid replication in viruses, BCNAs are being explored for their promising antiviral properties. The group of Dr. Jubi John revealed the use of a novel copper-catalysed tandem annulation method to synthesise a new class of bicyclic nucleoside analogues (BCNAs), specifically amino-substituted thiazolopyrimidine ribonucleosides. Optimization studies identified the best conditions and demonstrated that the method tolerates a broad scope of aliphatic and aromatic isothiocyanates, yielding products in moderate to good efficiency. The methodology was also applicable to 2'-deoxy-5-iodo-cytidine and proved scalable to gram quantities. Additionally, acetyl deprotection of the ribonucleosides was successfully achieved using ammonia in methanol, yielding the corresponding deprotected analogues. This work introduces a versatile and efficient synthetic route to structurally novel BCNAs, molecules known for their therapeutic potential in antiviral and anticancer applications, thereby contributing valuable tools for drug discovery and nucleoside analogue research.



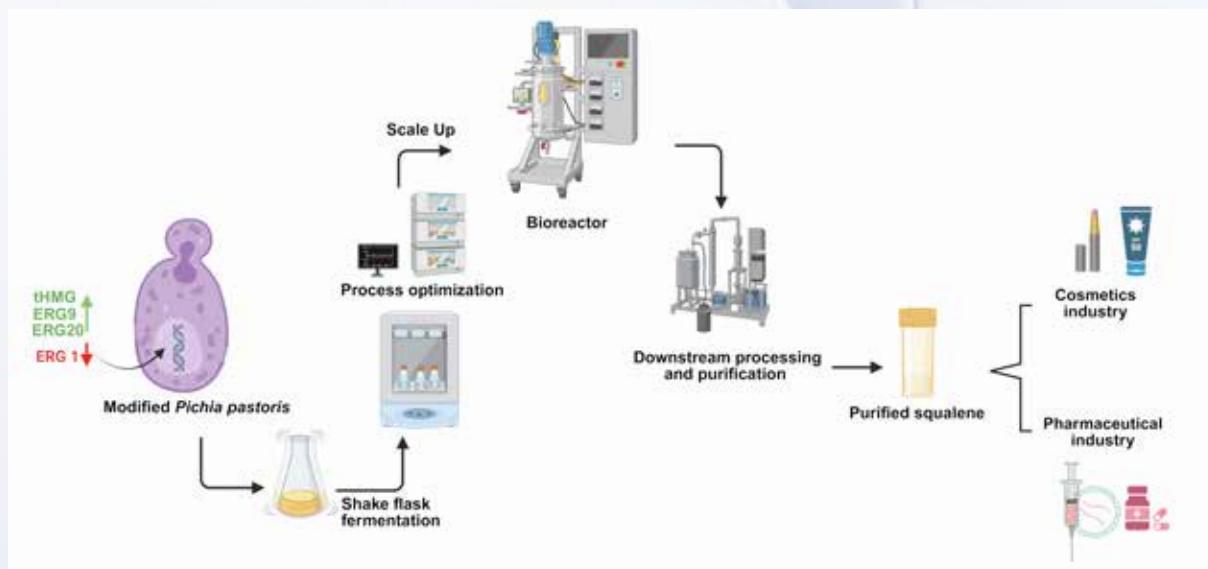
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Org. Biomol. Chem., 2025, 23, 2115-2119.

Engineering Methylotrophic Yeast *Pichia pastoris* for Enhanced Production of Squalene

Dr. Balakumaran P.A.

Squalene, a natural triterpene with widespread applications in the cosmetics and pharmaceutical industries, faces production challenges due to limited plant yields and significant environmental concerns surrounding shark-derived sources. The project led by Dr. Balakumaran aims to transform squalene production through the innovative microbial expression system *Pichia pastoris*, which offers a sustainable and scalable alternative. The ongoing project focusses on developing of efficient fermentation processes, optimizing growth conditions, and refining purification methods to produce high-yield squalene from genetically engineered *Pichia pastoris*. Ultimately, we aim to establish a cost-effective, large-scale production platform that meets the increasing demand for squalene while prioritizing sustainability and environmental protection. Genetically modified *Pichia pastoris* significantly enhance squalene accumulation and enable the sustainable, large-scale production of squalene in bioreactors for cosmetic and pharmaceutical applications. Overexpression of key rate-limiting enzymes in the mevalonic acid (MVA) pathway in conjunction with ERG downregulation via SQE inhibitors and CRISPR Cas9 mediated editing augment squalene yield in *Pichia pastoris*. The optimized genetically modified *Pichia pastoris* strain will maintain robust growth and high cell density in large-scale bioreactor environments (5L, 150L, 500L), leading to commercially viable squalene titers.



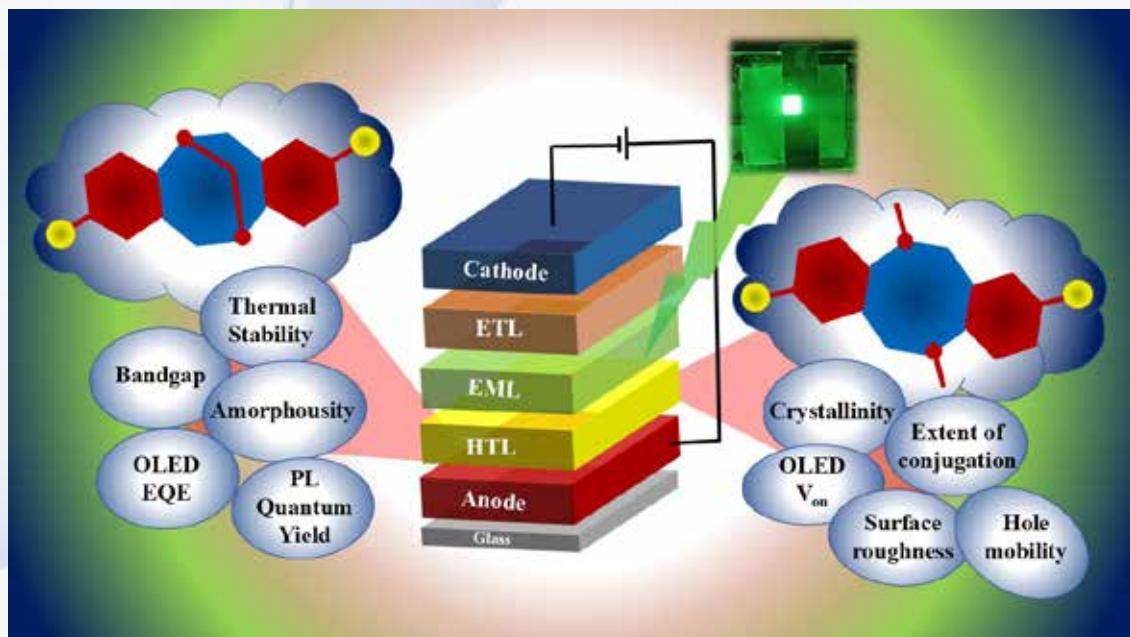
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Engineering in Life Sciences, 2024, 24, e202400003.

New Functional Materials for Light-Emission Applications

Dr. Ishita Neogi

Dr. Ishita Neogi is working in the field of functional materials for light-emission applications. Her research interest primarily involves the synthesis of different kinds of functional molecules for different layers of organic-light emitting diodes (OLEDs), such as hole-transport materials (HTL), emissive material (EM), electron-transport materials (ETL), host molecules, as well as dopants. She also develops synthetic methods wherever necessary to access these molecular systems. In-depth study of photophysics and OLED fabrication is pursued under her research program. One of her works, published in the Journal of Materials Chemistry C 2025, has been illustrated below, where she has modulated the bridging of the central diazocine core to maneuver the optoelectronic properties. Dr. Ishita, under the umbrella of the DST-DAAD project, is collaborating with Prof. Wolfgang Bruetting from the University of Augsburg, Germany to study the molecular orientation in thin films and develop efficient materials for OLEDs. She is also working on ligand engineering aspect to develop new perovskites. Based on her expertise in the area of synthesis, her group also works towards the development of process chemistry for specialty chemicals.



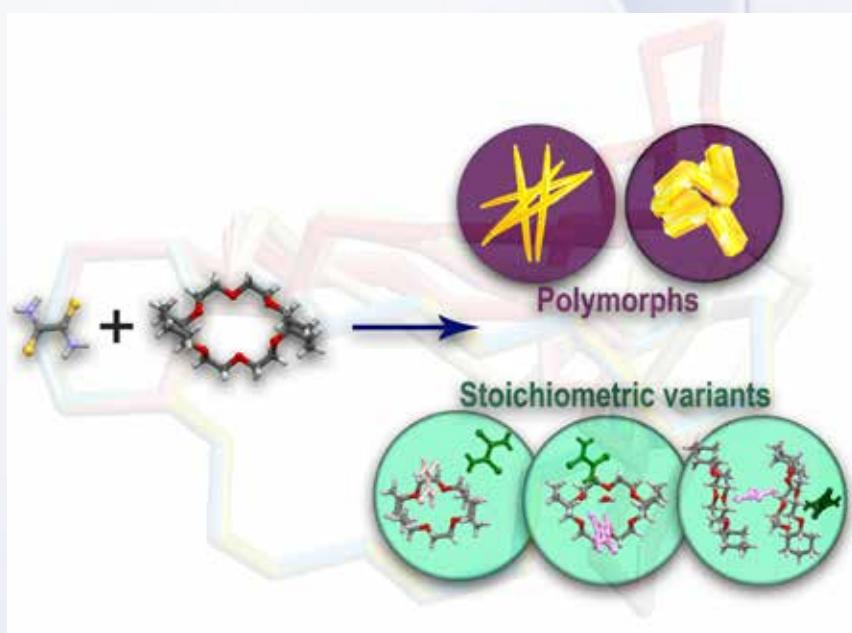
Reference:

J. Mat. Chem. C, 2025, 13, 11800-11813.

Polymorphs and stoichiometric variants of crown ether-based molecular complexes: exploring the landscape of conformational flexibility and supramolecular interactions

Dr. Sunil Varughese

Leveraging supramolecular interactions is an excellent route to explore the structural diversity of molecular complexes. The research group of Dr. Sunil Varughese utilized cocrystallization to obtain ternary systems of conformationally flexible crown ethers with dithiooxamide or 3,5-dinitroaniline (DNA) in the presence or absence of halogenated compounds to utilize the orthogonality of the supramolecular interactions—hydrogen and halogen bonds. Nevertheless, binary complexes predominated but in diverse crystal forms. Though not present in the crystal lattice, the halogenated compounds, as scaffolds, are critical in attaining the conformational diversity in the crown ethers. The structural diversity in the multi-component systems highlights the versatility of interactions and the conformational flexibility of crown ethers. The adaptable nature of crown ethers facilitated interactions with coformers, resulting in complexes of varied stoichiometries. Experimental and computational analyses reveal distinct conformational motifs favoured by these molecules, influencing interaction profiles and crystal forms. The study underscores the importance of understanding molecular flexibility and diverse interactions for material synthesis and molecular design.



Reference

CrystEngComm, 2025, 27, 2698

Environmental Technology





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Smt. Saharuba P. M.
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Ms. Meenu Baby V.
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Mr. Athul K.
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The Environmental Technology Division (ETD) brings together an interdisciplinary team-chemical, civil and environmental engineers, chemists, microbiologists, biotechnologists, and environmental scientists-to address key environmental issues. The division's core thrust areas include Environmental Clean-up Technologies, Environmental Management & Geospatial Modelling, and Dioxins Research & Risk Assessment. Its technologies include solid-state anaerobic digestion, bio-drying of municipal waste, biofilters for odour control, bio-electrochemical technology for H₂ production, and modular onsite wastewater treatment systems. A flagship achievement is the Effluent Treatment Plant (ETP) for the desiccated coconut industry (60 KLD), commissioned in Kasaragod in 2024 based on the patented Buoyant Filter Bioreactor (BFBR).

ETD's state-of-the-art integrated EIC/NABL/FSSAI accredited labs/services support research spanning dioxin-like POPs, emerging contaminants (PPCPs, perchlorate, PFAS, etc.). The division hosts India's first Dioxin research facility, equipped with sampling, extraction, and analysis, and validated as a national reference lab by FSSAI. Toxicology and risk assessment for emerging contaminants is another major activity. Additionally, testing and validation of biodegradable plastics, microbial composting inoculum and organic waste converters (OWC) are other services offered.

NIIST is a NABET-accredited agency with recognized expertise in conducting Environmental Impact Assessment (EIA) studies. It holds accreditations in key sectors such as mining of minerals, ports and harbours, mineral beneficiation, area development, and building and township projects. The division leads in inventorization of biomedical waste, e-waste, providing critical data for sustainable policy and resource management. Through these initiatives, NIIST plays a pivotal role in advancing environmental sustainability while contributing to National Mission Programmes and the achievement of the SDGs

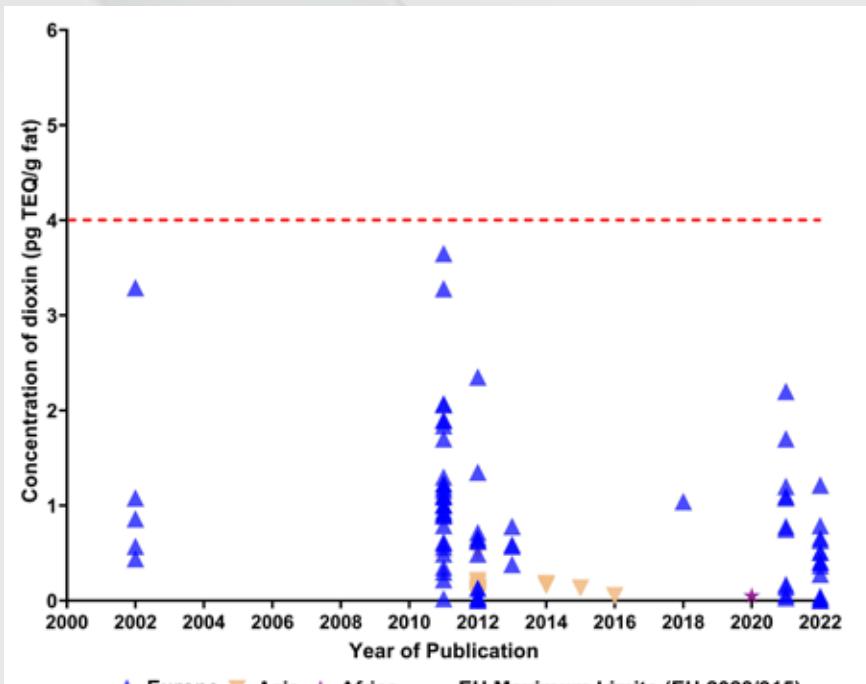
Focus Areas



Dioxin and Dioxin-like PCB Contamination in Animal-Origin Foods: Global Evidence, Monitoring Gaps, and Policy Implications

Dr. C. Kesavachandran

Dioxins and dioxin-like polychlorinated biphenyls are a group of lipophilic compounds classified under persistent environmental pollutants (POPs). Significant sources of dioxin emissions include industrial effluents, open burning practices, and biomedical and municipal waste incinerators. These emissions will enter the food chain and accumulate in animal-origin foods (AOFs). A systematic review was conducted to analyze the global levels of dioxins and dioxin-like PCBs in AOFs using PRISMA guidelines 2020. The data on the dioxin contamination in AOFs were extracted from 53 publications based on their presence in eggs, meat and meat products, milk



and dairy products, marine fish and fish products, and freshwater fish and crabs. A gap analysis was conducted based on the systematic review to understand the grey areas to be focused on the future. No trend of dioxin contamination in AOFs was observed. A significant gap area was found in the need for nationwide data generation in countries without periodic monitoring of AOFs for dioxin contamination. Source apportionment studies need to be explored for the dioxin contamination of AOFs. Large-scale screening tests of AOFs using DR-CALUX based on market surveys are required for data generation. The outcomes of the study will be helpful for stakeholders and policyholders in framing new policies and guidelines for food safety in AOFs.

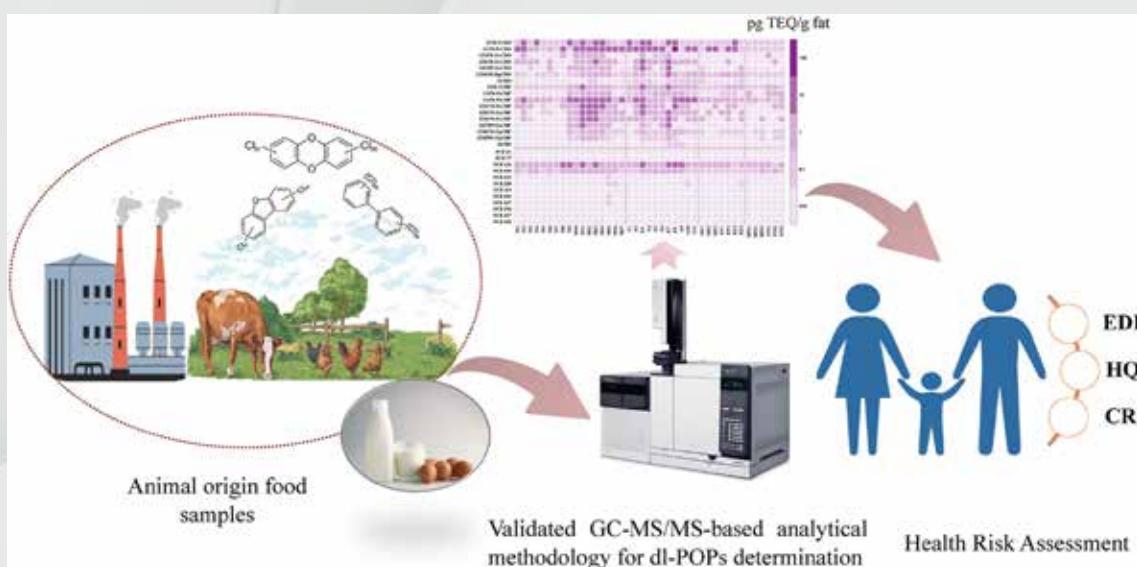
Reference:

Environmental Monitoring and Assessment, 2024, 196, 529

Foraging Animal-Origin Foods as Indicators of dl-POP Contamination Near a TiO₂ Production Facility in Southern India

Dr. K. P. Prathish

Titanium dioxide (TiO₂) is an important industrial chemical, and studies suggest its major production route - the chloride process could lead to the generation of unintentional dl-POPs. The present study explored the novel possibility of utilising foraging animal-origin foods as sensitive indicators for addressing this challenge and generated a globally beneficial dataset by assessing the background levels of dl-POPs in the vicinity of a TiO₂ production house in Southern India. Systematic sampling of foraging cow's milk and free-ranging hen's eggs was carried out from the study site, and the dl-POPs assessments were conducted utilising an in-house developed cost-effective GC-MS/MS-based analytical methodology. Elevated health risks were inferred for the population in the industrial zones with weekly intakes weighing about 0.15 to 17 times the European Food Safety Authority-assigned levels. The consumption of foraging cow's milk was observed to have a higher contribution towards the hazard indices and cancer risk estimates and were significantly higher ($p < 0.05$) for children.



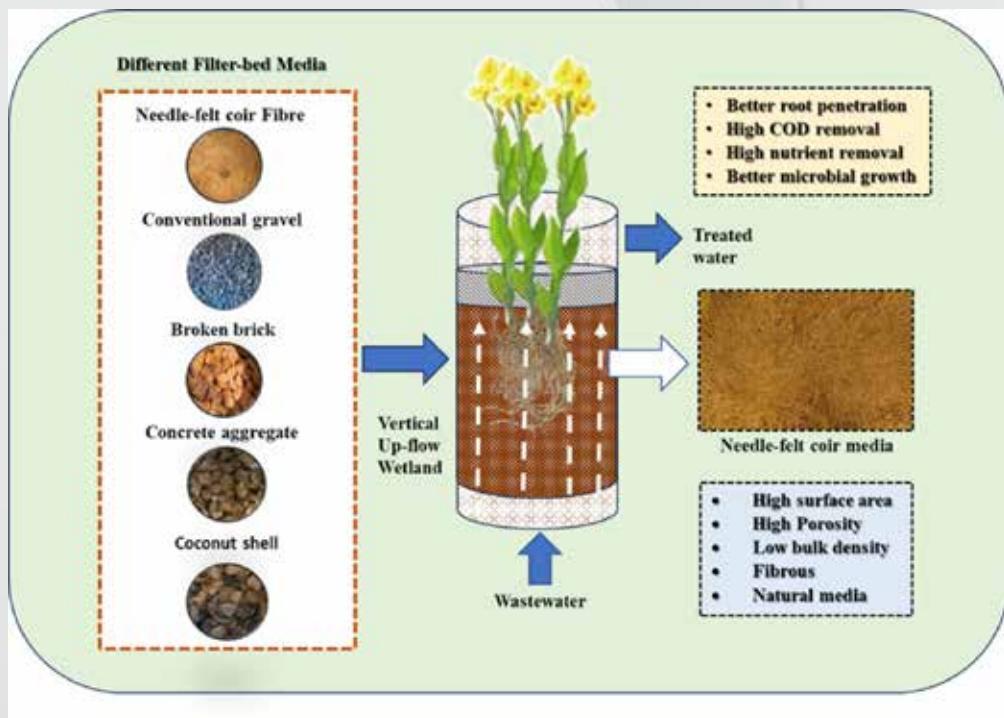
Reference:

Chemosphere, 2024, 357, 142078

Needle-Felt Coir Fibre as a Sustainable High-Performance Filter Media for Constructed Wetlands

Er. Akshay D. Shende

This study compared needle-felt coir fibre (NCM) with conventional gravel (CGM), concrete waste (COM), coconut shell (CSM), and broken brick (BBM) as filter media in vertical up-flow constructed wetlands planted with *Canna indica*. NCM exhibited the highest removal efficiencies for COD (73.2%), BOD (89.3%), TN (48.4%), and TP (50.2%), surpassing CGM by 18–39% for organics and up to 44% for phosphorus. Higher porosity, favorable elemental composition (Ca, K, Fe), and fibrous morphology of NCM promoted biofilm growth, root penetration, and nutrient uptake. Pathogen removal was also superior, with up to 2.7-log reduction for *Vibrio*. Metagenomic analysis revealed that NCM supported richer microbial diversity, with distinct communities in the rhizosphere (nutrient-cycling bacteria) and media (organic degraders, denitrifiers). Plant growth in NCM was robust, second only to CGM, but with better nutrient removal. The study concludes that NCM is a sustainable, low-cost alternative for wetland filter beds, warranting further long-term and large-scale evaluations.



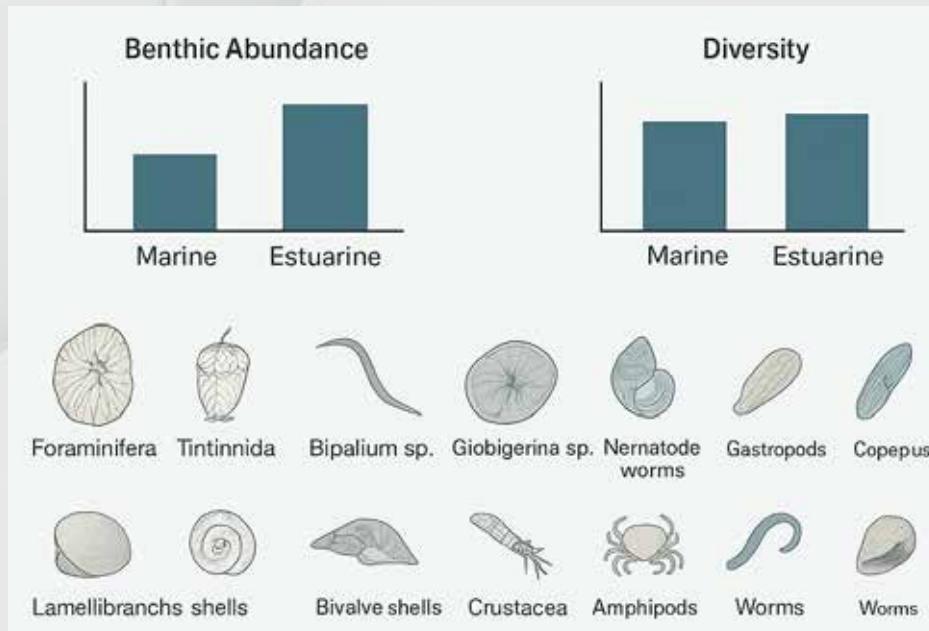
Reference:

Journal of Water Process Engineering 2024, 72, 107525

Monitoring, Impact Assessment, and Management of Meio and Macrofauna: A Case Study on Mineral Mining in the Coastal Environment of Kerala, India

Er. Saurabh Sakhre

This study evaluates the impact of open-cast mineral mining on meiofauna and macrofauna in the Neendakara–Kayamkulam coastal belt, Kerala, India. Six sediment samples—three from marine zones near mining areas and three from estuarine zones away from mining—were analyzed for species abundance and diversity. Results showed significantly lower abundance in marine areas adjacent to mining, while estuaries exhibited higher densities due to nutrient-rich, sheltered conditions. Key meiofauna included foraminiferan shells, tintinnids, nematodes, gastropods, and diatoms, with estuarine sites supporting greater numbers. Macrofauna such as lamellibranchs, gastropods, amphipods, and worms were also more abundant in estuaries. Diversity indices revealed higher species richness in marine sites but greater total abundance in estuaries, albeit with reduced evenness. Mining activities were linked to habitat degradation, sedimentation, and biodiversity loss. The study proposes mitigation measures including phased mining, seasonal restrictions, waste management, and manual extraction to balance mineral exploitation with ecosystem conservation.



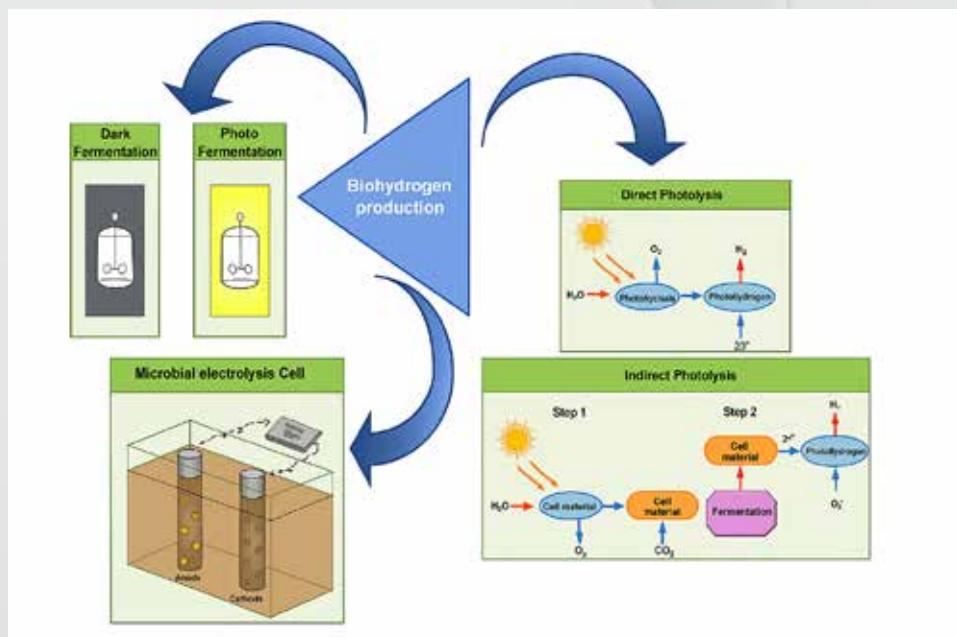
Reference:

Thalassas: An International Journal of Marine Sciences, 2024, 40, 1409

Bio-hydrogen production from various waste resources through circular economy

Dr. Partha Kundu

In the present global scenario, the imperative need for decarbonisation is rapidly driving the push towards the technologies for production of bio-hydrogen as a promising biofuel for the future. The escalating pace of industrial development and urban expansion has led to significant environmental degradation and intensifying the focus on bio-hydrogen. Consequently, research endeavours are directed towards its production using diverse renewable and sustainable resources. Over the past decades, numerous process and technologies have evolved for advance in bio-hydrogen production across various dimensions. To further enhancing the productivity of existing technologies, there is a need of growing emphasis on processes, that are not only more efficient but also commercially and economically viable, with a particular focus on resources like solid biomass and liquid waste over other renewable sources. The present study discussed in details about various process which includes thermochemical, biological, and electrochemical conversions, coupled with modified pre-treatment methods employing suitable conditions and parameters, which are emerging as more efficient, cost-effective means to enhance the yield of bio-hydrogen production as compared to conventional technologies. The present study specifically delved into a critical analysis of diverse technologies/processes developed over the years, particularly in the context of sustainable utilization of waste resources to circular economy through the generation of hydrogen.



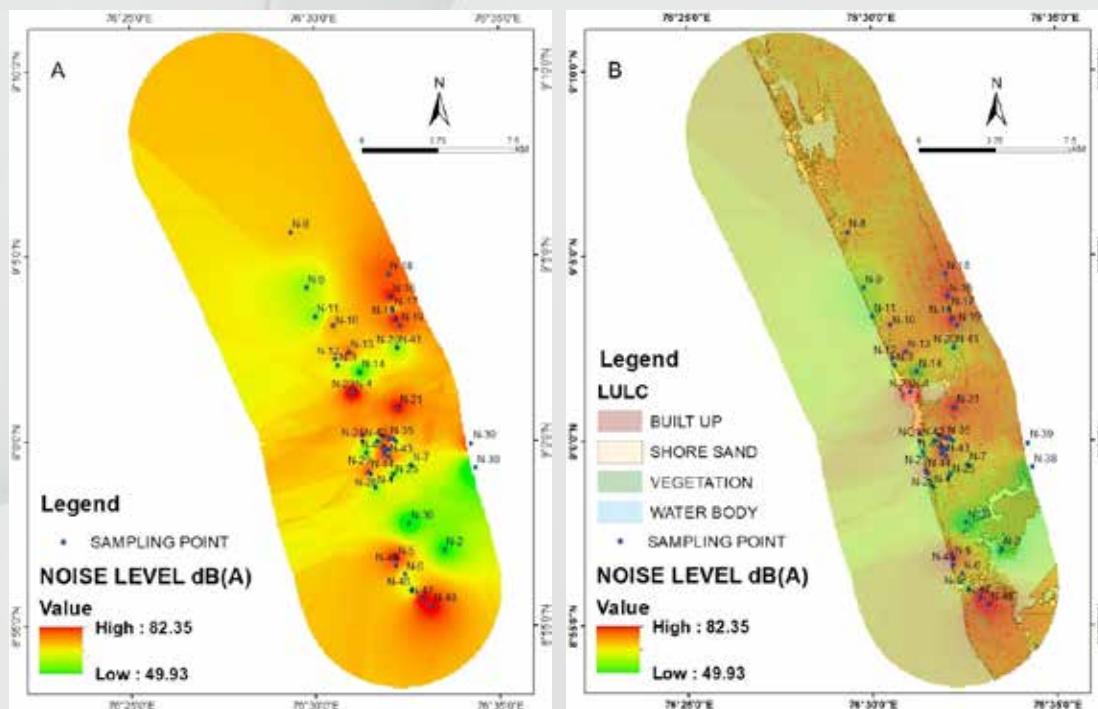
Reference:

Journal of Material Cycles and Waste Management 2025, 27, 1263

Noise pollution assessment and management in rare earth mining areas

Mr. Sravanth Tangellamudi

Rare earth elements are needed in more than 200 products across multiple industries, more so in high-tech consumer goods including computer hard drives, cell phones, electric and hybrid cars, flat-screen monitors, and televisions. In the Indian context, noise pollution has become widespread, but it is often accepted as a normal part of life rather than being recognized as pollution. Noise exposure has been linked to various psychomotor effects, including elevated stress levels, sleep disturbances, difficulties carrying out regular conversations, reduced focus, irritability, increased heart rate, tachyarrhythmia, vasoconstriction, hypertension, and other related illnesses. This research focuses on the Chavara deposit, a large beach placer deposit located along India's southwestern coast in the Kollam region of Kerala state. The combination of LULC data and noise mapping creates an effective tool for analyzing and regulating noise pollution in rapidly changing settings. According to our findings, there are noticeable hotspots at the industries, national highways, and commercial zones. Over the past two decades, patterns of noise pollution have been greatly impacted by the expansion of sand or beach regions and the reduction of vegetation.



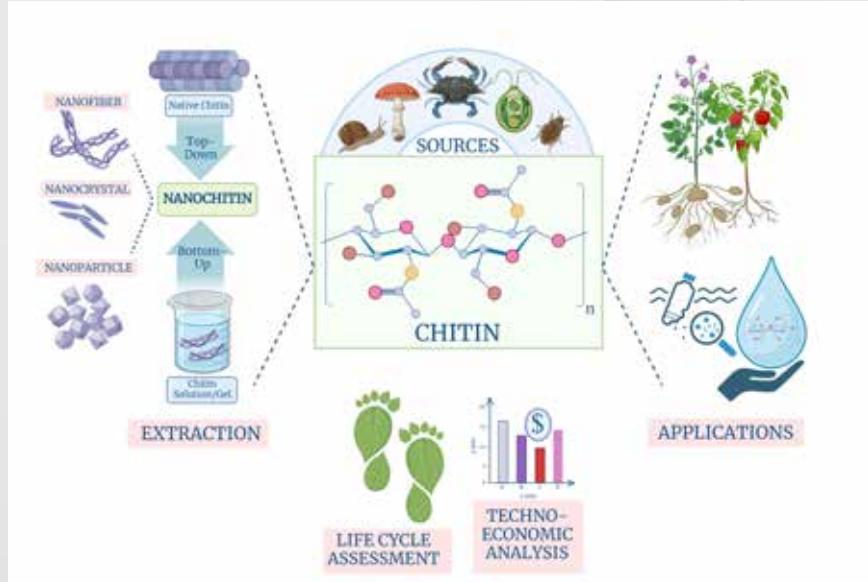
Reference:

Environmental Monitoring and Assessment, 2024, 196, 787

Chitin glucan complex nanofibers from fungal mycelium and their implication in biomaterials

Knawang C Sherpa

The need for a green and sustainable nanomaterial sourced from biomass in the form of nanochitin has raised interest in paving the way towards incorporating biological resources for the production of functional materials. Nanochitin, as nanofibers and nanocrystals/whiskers, has attractive features like its ability to self-assemble into multidimensional biomaterials while retaining its intrinsic characteristics. Chitin-glucan complex (CGC) extracted from a fungal source is appealing since fungi are widespread and found abundantly. The adoption of a top-down approach for the extraction of CGC from fungi through submerged fermentation (SmF) is promising since the process can be controlled, yielding relatively uniform properties. Herein, formulation and media optimization were able to improve the yield of the mycelial biomass. Further study will delve into the extraction of CGC under mild process conditions since fungi contain negligible mineral content that aids in the elimination of the demineralization step, which is generally encountered in crustaceans, thus reducing the process step and avoiding the use of harsh chemicals. The CGC is known to have beneficial properties such as biocompatibility, anti-inflammatory, biodegradability, non-toxicity and many more thus having potential to be applied in various industrial sectors like cosmetics, pharmaceuticals, environmental remediation etc.



Reference:

Science of the Total Environment, 2025, 965, 178607

Development and Evaluation of a Biofiltration System for Community Applications

Er. Abdul Haleem

The indigenously designed and fabricated lab-scale biofilter system for odour control has been installed and is under continuous evaluation. Incorporating features covered under US Patent No. 6,696,284, the system enables efficient microbial attachment, uniform air distribution, and effective odour degradation. Initial trials using odorous air from partially composted municipal solid waste showed an odour removal efficiency greater than 87%, as measured through Dynamic Olfactometry, which is the unique NABL accredited facility. The system achieved over 99% removal of key odorous compounds such as hydrogen sulfide (H_2S), ammonia (NH_3), total volatile organic compounds (TVOC), and methyl mercaptan (CH_3SH), with emissions maintained well within CPCB and OSHA permissible limits. These results demonstrate the high efficiency of the lab-scale biofilter in treating odorous gases from various sources.



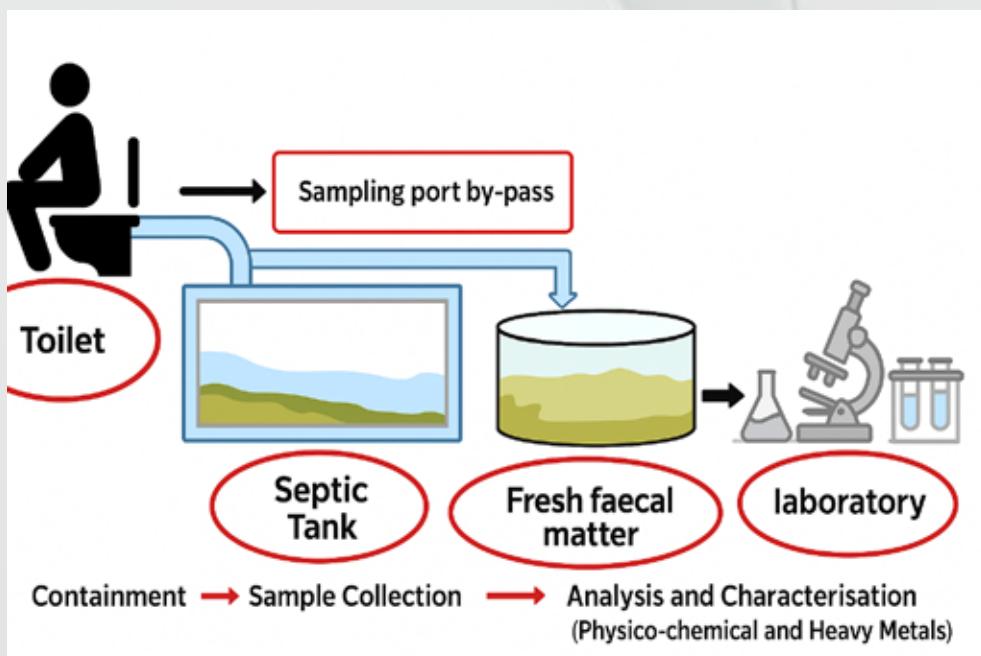
Reference:

US Patent No. 6,696,284

Physico-Chemical Profile of Fresh Faecal Matter: A Short-Term Study in Thiruvananthapuram, India

Dr. Krishnakumar B.

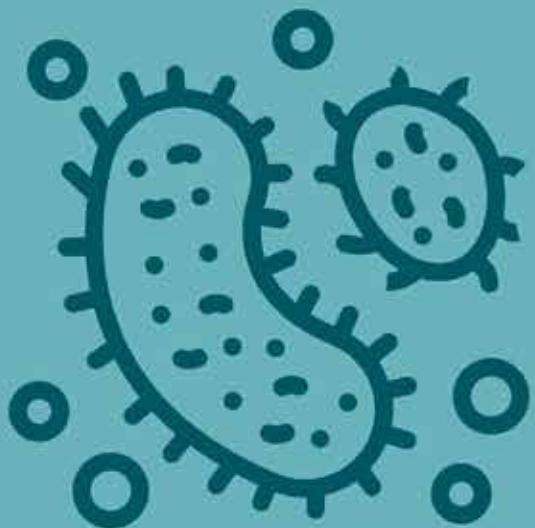
This study analyzed the physico-chemical and elemental characteristics of fresh faecal matter collected from a residential apartment in Thiruvananthapuram, Kerala, India, over four months, with samples taken every 8–10 days to capture variability. Parameters assessed included the effects of dietary habits and toilet cleaners on faecal sludge properties. Results showed high chemical oxygen demand (1850 ± 50 mg/L), total suspended solids (866.6 ± 200 mg/L), total Kjeldahl nitrogen (67.5 ± 20 mg/L), potassium (62.9 ± 10 ppm), sodium (49.1 ± 12 ppm), and iron (30.2 ± 15 ppm). Elemental composition included carbon (31.62%), hydrogen (4.51%), nitrogen (2.32%), and sulphur (2.22%), yielding a C:N ratio of 13:1. Detected metals included magnesium, aluminium, calcium, lead (0.32 ppm), and silver (1.14 ppm). These baseline data are crucial for developing improved faecal sludge treatment systems as sustainable alternatives to septic tanks or soak pits, particularly in coastal zones where population density is high and environmental risks from inadequate sanitation are significant.



Reference:

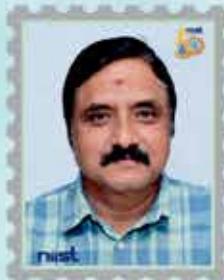
Environmental Monitoring and Assessment, 2024, 197

Biosciences & Bioengineering





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(Principal Scientist)



Dr. Muthu Arumugam
(Principal Scientist)



Dr. Pinaki Dey
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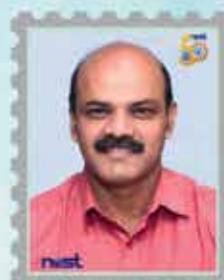
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Dr. Venkatesh T.
(Senior Scientist)



Dr. Harsha Bajaj
(Senior Scientist)



Mr. Jedy Jose
(Senior Technical Officer-3)

The Biosciences and Bioengineering Division (BBD) focuses on sustainable solutions in biofuels, bio-based materials, bioplastics, and chemicals, addressing global challenges such as food security, resource depletion, and climate change. A dedicated Centre for Biofuels supports R&D in second-generation bioethanol with a pilot plant for lignocellulosic bioethanol and an enzyme production facility, enhancing cost-efficiency and scalability. The division also leads microbial-based bioprocess research, forging key industrial collaborations in areas like fermentation, biomass conversion, probiotics, algal technology, and agri-biotech products. In healthcare, BBD is advancing modern medicine through innovations in diagnostics, nanotechnology, and precision therapies. Key areas include early cancer detection using SERS, targeted drug delivery, antimicrobial resistance (AMR), and gut microbiome research. These efforts align with the global shift toward personalized, technology-driven healthcare, aimed at improving patient outcomes and ensuring long-term sustainability.

Focus Areas

Bioprocess for Chemical & Polymers

Biomass Conversion & Biorefineries

Healthcare Diagnostics

Algal Biotechnology

Synthetic Biology

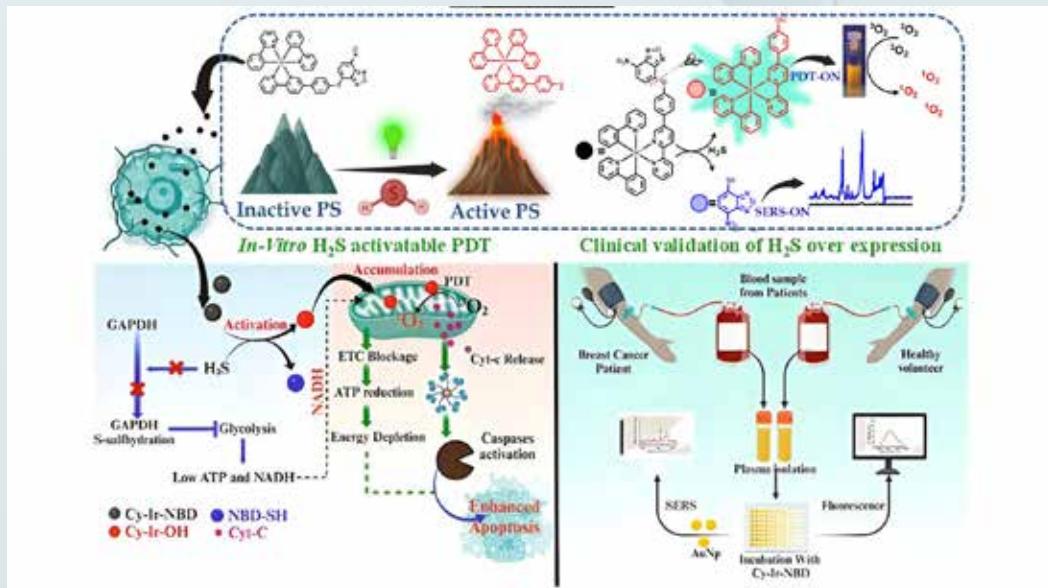
Industrial and Speciality Enzymes

Plant Microbe Interactions

Hydrogen Sulfide-Induced Activatable Photodynamic Therapy Adjunct to Disruption of Subcellular Glycolysis in Cancer Cells by a Fluorescence-SERS Bimodal Iridium Metal-Organic Hybrid

Dr. Kaustabh Kumar Maiti

In this work, we have designed an activatable photodynamic molecular hybrid (APMH) based on a cyclometalated iridium complex coupled with H_2S -responsive 7-nitrobenzofuran (Cy-Ir-NBD), offering multifunctional theranostic biomedicine for cancer treatment. The APMH is activated in the presence of H_2S through a nucleophilic substitution reaction by eliminating the NBD unit within the tumor microenvironment. Upon activation triggered by H_2S , Cy-Ir-NBD transforms into the PS Cy-Ir-OH, initiating laser-induced PDT within cancer cells and reducing H_2S levels in the cellular environment. This depletion of H_2S disrupts GAPDH activity, resulting in decreased glycolysis and ATP production in cancer cells. Our approach achieves a dual therapeutic effect by leveraging H_2S properties for specific activation of Cy-Ir-NBD, promoting PDT, and disrupting the glycolytic metabolism of cancer cells. This synergistic effect enhances the overall efficacy of the treatment, presenting a molecular precision for cancer therapeutics. Additionally, the multifunctional nature of our approach allows for real-time visualization of the events in dual mode of fluorescence and surface-enhanced Raman scattering (SERS) modality.



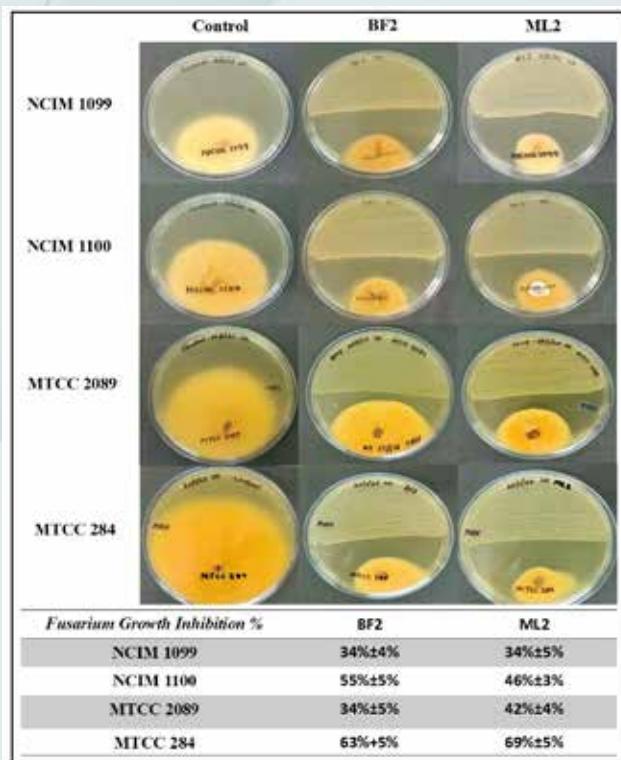
Reference:

ACS Applied Materials & Interfaces, 2024, 16, 27114

Lactic acid bacteria as a biocontrol agent against Fusaria and Fusarium Mycotoxins

Dr. K. Madhavan Nampoothiri

As significant fungal pathogens of crops, Fusaria species contaminate various food and feed commodities. Some of the Fusarium spp. secondary metabolites (e.g., trichothecenes, zearalenone, and fumonisins) are widely known toxic molecules (mycotoxins) with chronic and acute effects on humans and animals. Newly isolated strains were characterized and tested for their antifungal capacities on Fusarium plant pathogens such as *Fusarium verticillioides* NCIM 1100, *F. verticillioides* NCIM 1099, *Fusarium graminearum* MTCC 2089, and *Fusarium oxysporum* MTCC 284. The isolated cultures were belonged to *Limosilactobacillus fermentum*, *Lactiplantibacillus Plantarum* and *Wesiella* species. All tested LABs and their cell-free culture supernatants showed antagonism on the MRS solid medium.



Reference:

Microorganisms 2025, 13, 666

Toxins 2025, 17, 68

Green synthesis, characterization and functional validation of bio-transformed selenium nanoparticles

Dr. Arumugam, M.

Selenium is an essential micronutrient recognised for its potent antioxidant and anticancer properties, making it valuable as a dietary supplement. However, the toxicity of conventional inorganic selenium limits its clinical use. In contrast, organic and elemental nanoforms of selenium offer improved bioavailability, reduced toxicity, and enhanced therapeutic potential. The Algal Biotechnology research group at CSIR-NIIST demonstrated the green, scalable biosynthesis of elemental selenium nanoparticles (Se^0 NPs) using the edible marine microalga. Optimised conditions were established for efficient nanoparticle synthesis. The Se^0 NPs were thoroughly characterised using advanced techniques such as UV-Vis spectroscopy, DLS, zeta potential, HR-TEM, EDX, AFM, FT-IR, Raman spectroscopy, and XPS. FT-IR analysis confirmed the role of microalgal proteins and peptides in capping and stabilising the nanoparticles, indicating a biologically driven reduction process. Biological evaluation of the Se^0 NPs revealed significant antioxidant activity, with a 74% radical scavenging capacity in a concentration-dependent manner. This green synthesis approach is sustainable, eco-friendly, and commercially viable, offering a promising route for the large-scale production of stable selenium nanoparticles. These biologically synthesised Se^0 NPs hold strong therapeutic potential and are ideal for next-generation dietary supplements, functional foods, and animal feed formulations.

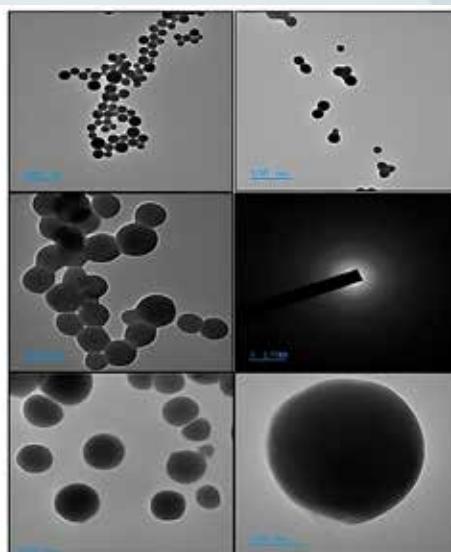


Fig. High Resolution –Transmission Electron Micrograph of Biogenic Selenium (Se) nanoparticle with SAED profile

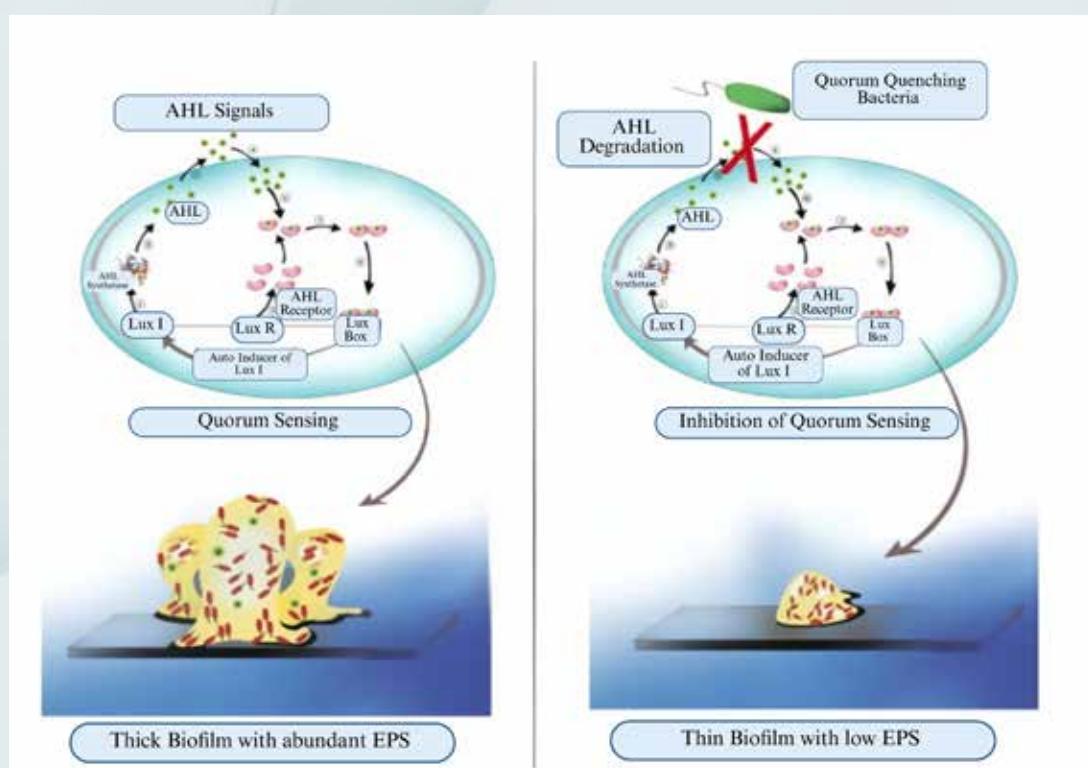
Reference:

Biochemistry and Biophysics Reports, 2024, 39, 101760

Isolation of Quorum Quenching bacteria to disrupt intracellular communication mediated by AHL signals for biofilm control

Dr Rakesh Yasarla

Present study aims to isolate bacteria that can disrupt intercellular communication mediated by *N*-acyl homoserine lactone (AHL) signals and investigate its effect on *Pseudomonas aeruginosa* extracellular polymeric substances (EPS) secretion and biofilm formation. Four bacteria identified as *Bacillus cereus*, *Paenibacillus polymyxa*, *Microbacterium paraoxydans*, and *Mesorhizobium thiograngeticum* showed broad spectrum AHL degradation irrespective of acyl chain length or C3 substitution which was confirmed by analytical studies using gas chromatography-mass spectrometry (GCMS). The present study provided the first evidence of *Mesorhizobium* as a potential QQ bacteria and its promising role as an effective biofilm control agent.



Reference:

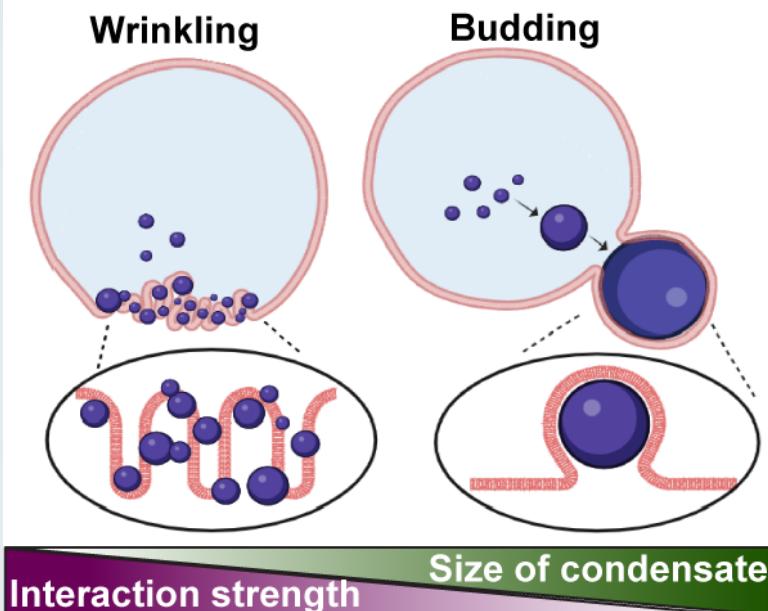
Journal of Environmental Chemical Engineering, 2025, 13, 115974

Membrane Remodeling by Biomolecular Condensates: A Biophysical Basis for Emerging Drug Targets

Dr. Harsha Bajaj

Biomolecular condensates, also known as Membrane-less organelles (MLOs) arising from liquid-liquid phase separation (LLPS) of cellular biomolecules, play significant roles such as cellular organization, regulating metabolism, gene regulation, and increasing fitness of cells. Several of these processes comprise phase-separated condensates and membranes that manifest in various configurations, each yielding distinct implications for the functionality of biomolecular and membrane constituents. However, due to the nanoscopic size of the condensates in cells, understanding the fundamental biophysical mechanisms and quantifying the interactions remains a challenge. In this work we address How condensate size affect its interaction with membranes? How membranes physically control the size of condensates, especially in complex condensate systems? Condensate affecting the membrane remodeling and physical properties of lipid membranes. Our findings demonstrate a trade-off between the size and electrostatic interaction of condensates with membranes, which favors global membrane remodeling like budding and lipid membrane wrinkling at the coacervate-membrane interface restricting coarsening of droplets. We reveal an unprecedented conclusion that large and comparable-sized coacervates can give rise to global membrane deformation such as budding when charge-charge interaction of condensates between membrane-bound compartments is low or moderate.

Condensate-Membrane Interaction

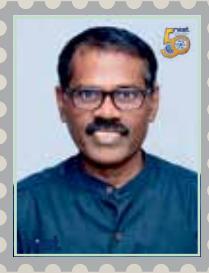


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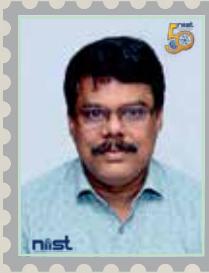
Small 2025, 2501470

Materials Science

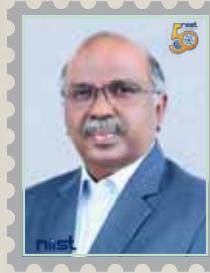




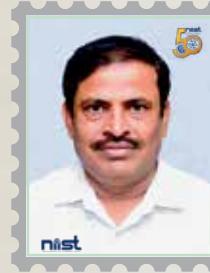
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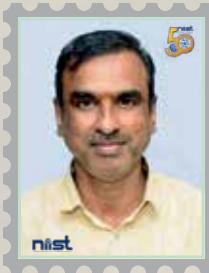
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Mr. Harish Raj V.
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Mr. Harikrishnan H.S.
(Technician-1)

Materials Science and Technology Division [MSTD] has 16 scientists, and 4 technical staff engaged in the cutting-edge research and development activities in the areas of metallic materials, minerals, ceramics, bio polymers, nano composites and industrial wastes utilization for circular economy. The R&D projects in MSTD primarily falls within the mandate of the CSIR Themes categorized as CLP, 4M, AEISS, E3OW, and EES. Within these thematic areas MSTD develops process know-how for producing advanced functional materials, light weight alloys, electronic materials for sensors, actuators and energy generation devices, jointly with strategic sectors and manufacturing industries. The polymer activity focuses on functional aerogels, biopolymer derived sustainable packaging materials, industrial adhesives, PU and Polyol formulations for coatings.

Apart from the scientists and technical staff, the division also has 98 Research Scholars, including project Associates (PAs) and 3 Post-Doctoral Fellows (PDf). The division has around 59 research projects including funding from the DST, VSSC, IREL, DRDO and CSIR. Among this, nearly 15 projects are supported by industries. In the year 2024-25, the division generated a total revenue of Rs 10.36 Crore from these projects. The Division established collaborations with leading industries such as HAL, TATA Metalliks, JSW, Hindalco, Tata Steel, Ultramarine Pigments Ltd, Akashganga Biosciences Pvt Ltd, NS & Co, ZF WAPCO, ITC, SRF Ltd and Momentive to conduct research and development on specific industry related issues. The division also signed MoU with VSSC for advanced ceramic composite tiles for supersonic vehicles. The division actively participated in Golden Jubilee year celebration and also India International Science Festival, IISF 2024 @ IIT, Guwahati. The division produced 78 publications, 3 Patents and 1 technology transfer on 'Plant oil based bio-resin synthesis for paper coating'. The division also established BIS Hall Marking Gold testing facility which was inaugurated by Honourable Minister Dr. Jitendrasingh in the presence of Director, NIIST. In the years, 10 PhD was also awarded. The division also added new research facilities such as Vacuum Induction Furnace, Rolling Mill and EDXRF for alloy program.

Focus Areas

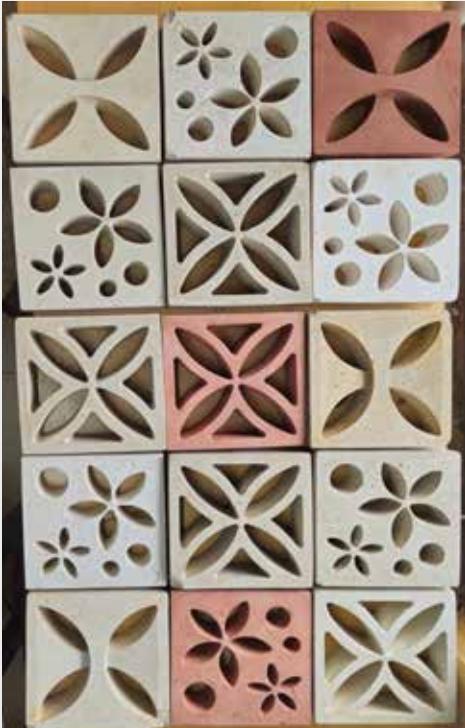
- **Metallic Materials**
- **Rare Earths, Minerals and Critical Materials**
- **Electronic Ceramics, Polymers and Composites**
- **Industrial Solid Wastes and E-Wastes Processing (Waste to Wealth)**

Process Know-How and Technology Package for Innovative Building Materials

Dr. S. Ananthakumar

The rapid growth of National Highways Infrastructure projects has driven increased demand for construction materials like M-sand, P-sand, and natural stone, leading to a rise in stone crushing units and production in excess quantities of rock dust. While rock dust is used in cement blocks up to 10%, MSMEs are exploring innovative applications. CSIR NIIST, in collaboration with Akashganga Biosciences Ltd and NS & Co Pvt Ltd, has developed a process to convert rock dust into high-value construction materials like jali and compressed bricks. The technology utilizes 50-60% rock dust, employing cold compression and simple casting methods. The products, tested for strength, water absorption, density, and wet-strength, can be made with minimal cement (as low as 6%) as a bonding agent.

Jali bricks and compressed blocks manufactured using CSIR-NIIST process know-how at factory conditions



Reference

MoU signed with M/s Akashganga Biosciences Limited (Satara, Maharashtra) and NS & Co., Trichy

Process Know-How and Technology package on Scandium Extraction

Dr. M. Sundararajan

India has significant low- and medium-grade titanium mineral deposits along its coast, with over 20% classified as low-grade ilmenite, a mix of ilmenite and titano-magnetite. CSIR NIIST conducted detailed analysis using advanced techniques like XRF, ICP-MS, XPS, and SEM-EDAX to assess trace elements in these deposits along the southwest and southeast coasts. The study found scandium concentrations ranging from 25 mg/kg to 78 mg/kg and rare earth elements (REE) between 350 mg/kg and 600 mg/kg. Using Seredin's classification, NIIST categorized these minerals as "class-II," indicating their potential as secondary resources. Given the domestic shortage of scandium and critical REEs, NIIST developed a technology for extracting scandium from low-grade titanium minerals and ilmenite processing leach liquor. The process has been successfully demonstrated to companies like M/s Kerala Metals and Minerals Ltd, Kollam, and M/s V.V. Titanium Pigments Ltd, Tuticorin.



Reference:

R&D Project funded by Ministry of Mines, Govt. of India

Printed RFID for Proximity Sensing

Dr. K. P. Surendran

Position sensing using RFID enables real-time, contactless tracking of objects, people, or equipment across various applications.

RFID technology offers a low-cost, scalable method for fabricating antennas and circuits using conductive inks on flexible substrates like paper, PET, or textiles, replacing traditional, costly methods like etching and coil winding. Screen printing is a more efficient alternative, allowing for rapid production with minimal waste and the ability to customize antenna shapes and sizes. This makes it ideal for integrating RFID tags into everyday objects like packaging, textiles, and labels, with applications in smart packaging, supply chain monitoring, wearables, and IoT. Its compatibility with roll-to-roll manufacturing and environmental benefits further enhance its value.

The Electronics Materials Research Group at NIIST has developed a highly flexible UHF antenna using screen-printed silver and integrated it into an RFID tag. This tag was then transformed into a wearable smart band for Android-based position and proximity sensing. The RFID-enabled wearable could serve as a valuable tool for disaster management, providing localization when traditional GPS fails. Currently, at TRL 4-5, the technology is being customized for third-party validation.



Schematic representation of fabrication process

Reference:

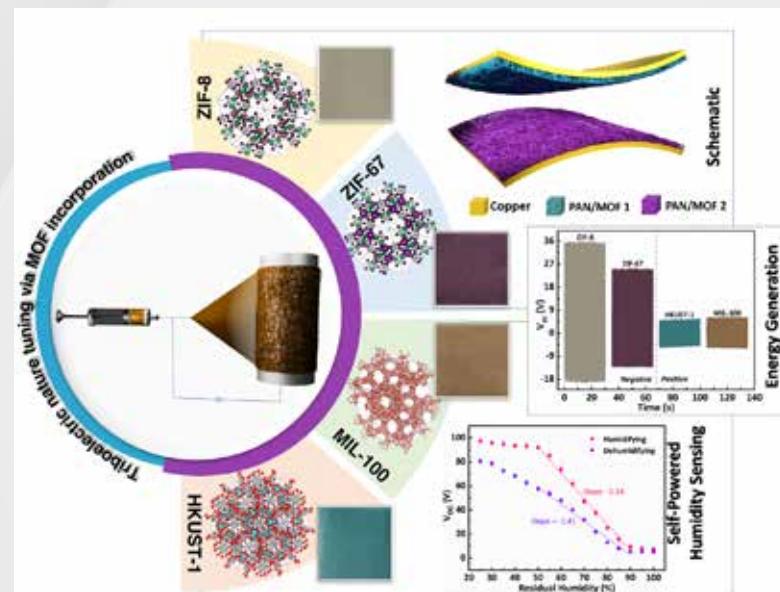
Journal of Materials Chemistry C, 2024, 12, 575

MOF-Engineered PAN Nanofibers: A New Frontier in Tuneable Triboelectric Nanogenerators and Self-Powered Sensors

Dr. Achu Chandran

Triboelectric nanogenerators (TENGs) offer a sustainable method to convert ambient motions, such as human activity, vibrations, and wind, into electricity, eliminating the need for batteries and external power. TENGs are ideal for powering low-energy IoT devices and wireless sensor networks in remote areas, enabling self-powered systems for real-time monitoring in smart healthcare, environmental surveillance, and infrastructure diagnostics.

CSIR-NIIST developed a strategy to enhance the triboelectric performance of electrospun polyacrylonitrile (PAN) nanofibers by incorporating porous Metal-Organic Frameworks (MOFs) like ZIF-8, ZIF-67, HKUST-1, and MIL-100. This innovation modulated PAN's tribopolarity, making it either tribonegative (ZIF-8) or tribopositive (MIL-100). The MOFs also improved surface roughness and porosity, increasing contact area and boosting TENG output. A prototype with ZIF-8/PAN and MIL-100/PAN layers generated 100 V and 1.3 μ A. The MOF-PAN composites were applied to self-powered sensors, showing fast response and high sensitivity in humidity sensing (2.14 V/%RH) and effective pressure sensitivity in force sensing. This work demonstrates MOF-based composites as promising materials for advancing energy harvesting and self-powered sensing technologies.



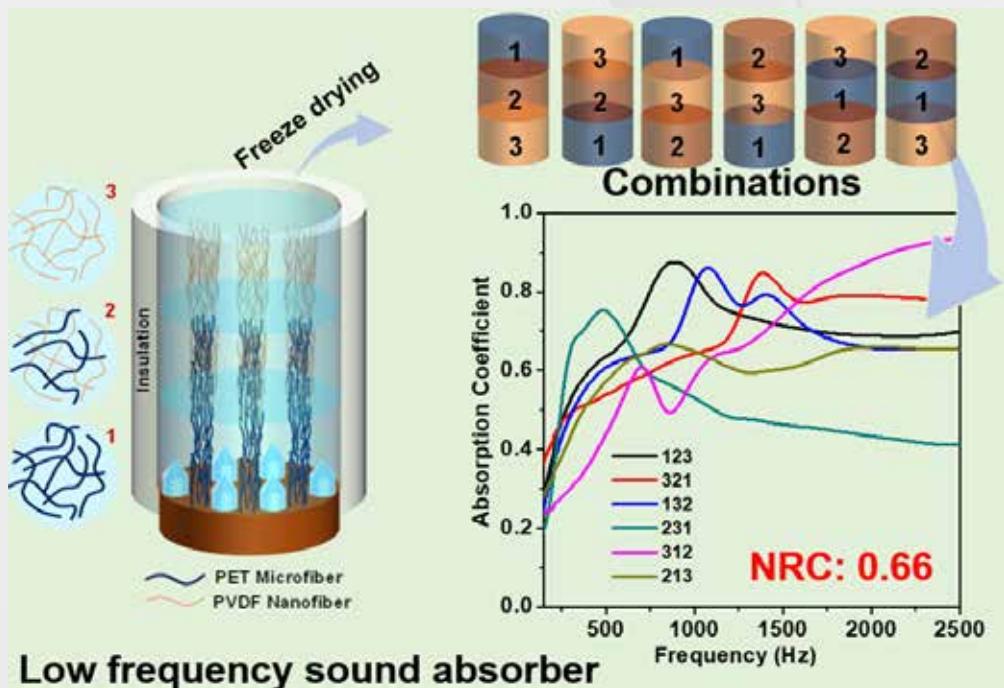
Reference:

Advanced Functional Materials, 2025, 35, 2411855

Gradient Pore Structured Polymeric Fibrous Aerogels for Effective Low-Frequency Noise Absorption

Dr. E. Bhoje Gowd

Traffic and industrial noise have been considered the most disturbing pollution that induces severe health hazards to humans. Porous materials are commonly used for sound-mitigating applications; however, realizing high elasticity and sound absorption ability at low frequencies has remained a great challenge. CSIR-NIIST has developed a strategy to create gradient-structured ultralight-weight and elastic polymer-based fibrous aerogels by layer-by-layer assembly of polymer micro and nanofibers in different combinations, utilizing step-by-step directional freezing and freeze-drying methods. This approach allowed us to integrate polyethylene terephthalate (PET) microfibers (MF) and polyvinylidene fluoride (PVDF) nanofibers (NF) in different combinations and the combination with MF/(MF and NF blend) MNF/NF units shows the best noise reduction coefficient of 0.66. The gradient-structured fibrous aerogels exhibit ultralightweight, elasticity, and good mechanical properties.



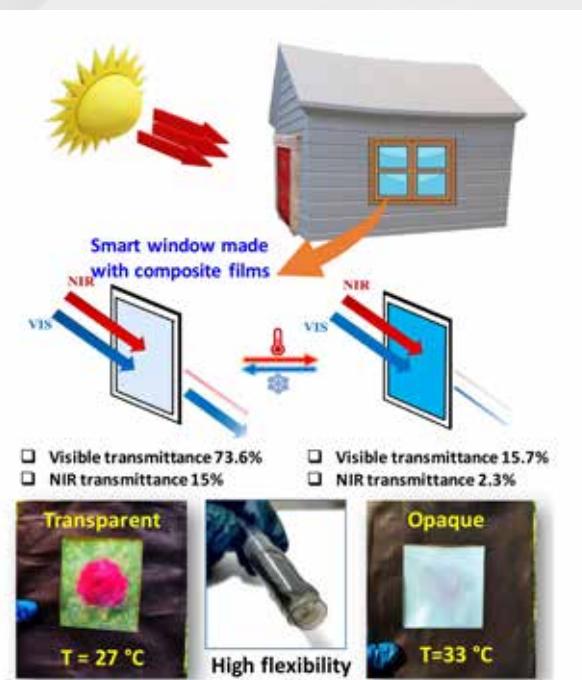
Reference:

ACS Appl. Polym. Mater., 2024, 6, 9995
ACS Appl. Mater. Interfaces, 2025, 17, 9818

Thermoresponsive and Flexible Inorganic Nanoparticle–Polymer Hydrogel Films with Enhanced Infrared Shielding for Smart Window Applications

Dr. Sushanta K. Sahoo and Dr. Subrata Das

NIIST developed a thermoresponsive flexible hydrogel film for smart windows and curtains, designed to improve building energy efficiency by regulating near-infrared (NIR) shielding and visible light transmittance. The hydrogel, based on poly(N-isopropylacrylamide) (pNIPAM), has a lower critical solution temperature (LCST) precisely tuned to 27.4°C through copolymerization with 10 wt% acrylated epoxidized methyl ricinoleate (AEMR). To enhance NIR shielding, $\text{Cs}_{0.33}\text{WO}_3$ nanoparticles were synthesized using high-energy ball milling, with AEMR ensuring effective dispersion. The 0.7 wt% $\text{Cs}_{0.33}\text{WO}_3$ hydrogel film (0.7– $\text{Cs}_{0.33}\text{WO}_3$) showed optimal performance, reducing NIR transmittance from 15.0% to 2.3% and visible light transmittance from 73.6% to 15.7% during thermal switching. It also achieved an integral luminous transmittance of 68.7%. A model house study confirmed a 7°C indoor temperature difference, highlighting its thermal insulation efficiency. The hydrogel film also demonstrated excellent flexibility, water resistance, and thermal stability, making it a promising material for energy-saving smart windows and curtains.



Reference:

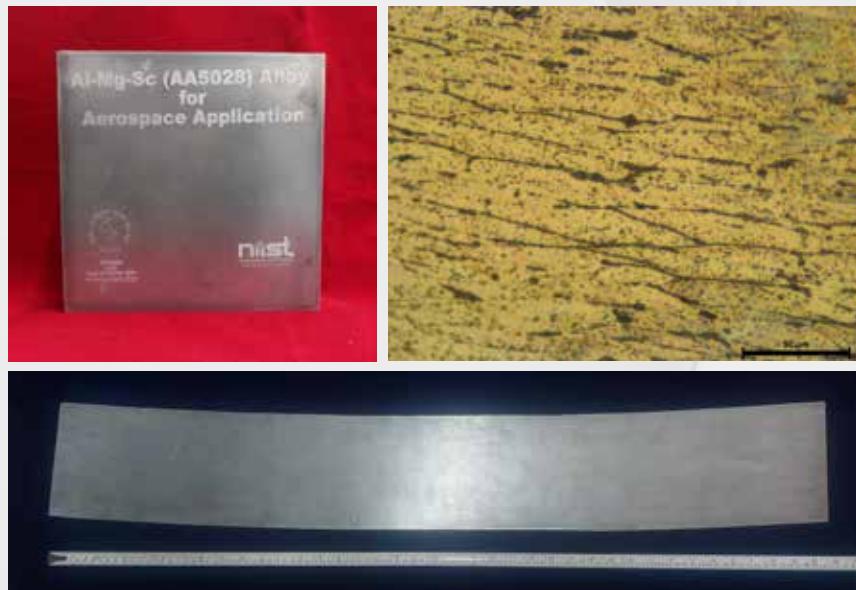
Chem. Eng.J., 2024 490, 151603

Development of Lightweight and High-strength Al-Mg-Sc Alloys for Aerospace Structures

Dr. Parijat Pallab Jana and Dr. T. P. D. Rajan

Al-Mg-Sc lightweight alloy sheets are ideal for aircraft fuselage skin, offering high strength (YS: 340 MPa, El: 12%), excellent damage tolerance, and corrosion resistance. These alloys can replace the conventional AA2024 (Al-Cu) alloy with minimal design changes. Al-Mg-Sc alloys feature low density, good corrosion resistance, excellent weldability, and high thermal stability. The enhanced properties of Sc-added aluminum alloys are due to Al_3Sc precipitates interacting with dislocations. The addition of Sc and/or Zr forms coherent L1₂ structure $\text{Al}_3(\text{Sc}/\text{Zr})$ particles, which refine grains and strengthen the alloy. Small amounts of Sc and Zr can boost mechanical strength by up to 50% through nanoscale precipitates (5-20 nm). The Sc addition provides a strong balance of strength, ductility, and crack growth resistance, along with improved corrosion resistance and elevated temperature strength compared to Al-Mg alloys.

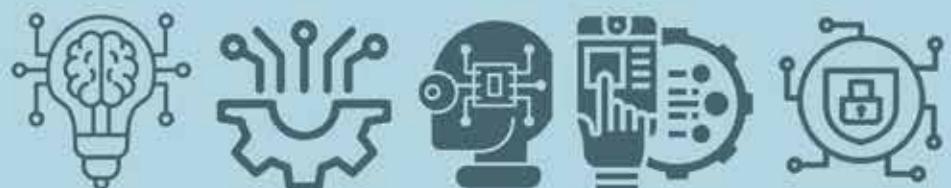
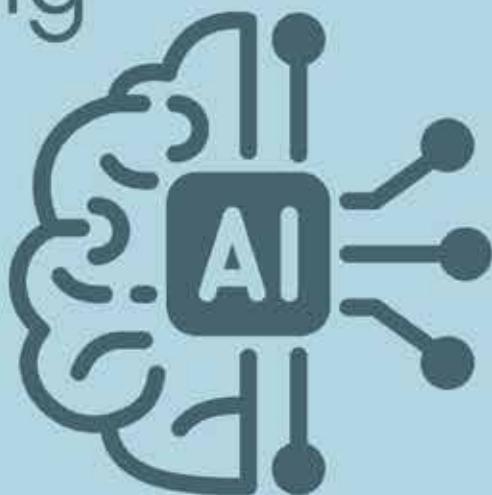
CSIR-NIIST, Thiruvananthapuram, developed the Al-Mg-Sc alloy using squeeze and gravity casting, followed by hot and cold rolling to produce a final plate dimension of 1000 × 160 × 3 mm. The indigenously developed alloy achieved optimized mechanical properties: yield strength of 350 MPa, ultimate tensile strength of 410 MPa, and elongation of 10%.



Reference:

J. Sustainable Metal. 2025, 1-10
Technology transferred to M/s Star Alucast, Mumbai

Artificial Intelligence & Machine Learning





Dr. Ramesh K. V.
(Chief Scientist & Head)



Dr. Arun Kumar V.
(Principal Scientist)

The AI & ML Unit at CSIR-NIIST is building a strong predictive analytics team to deliver advanced, customized AI/ML solutions. Our research focuses on developing intelligent deep learning algorithms and hybrid models that learn from real-world data to drive innovation through data-driven insights, visualization, and predictive analytics. We integrate mathematical and dynamical system modeling, AI-driven data integration, and image analytics to create impactful solutions across sectors such as agriculture, food processing, healthcare, energy, and the environment. Current projects include deep learning-based segmentation models for crop identification, medical imaging, and high-resolution image analysis. Additionally, our in-house multivariate models are being validated for real-time prediction of disease outbreaks like Malaria using district-level data from across India.

Focus Areas

Deep learning algorithm

Interdisciplinary implementation of AI & ML

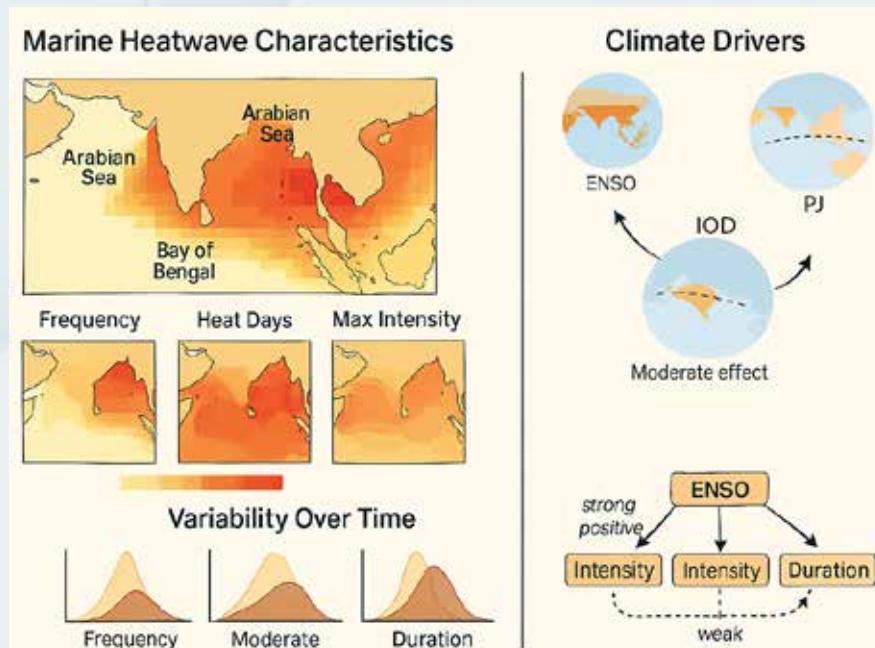
Predictive data analytics

DL models for IoT and edge computing

Unraveling Marine Heatwaves in the Indian Ocean

Dr. K.V. Ramesh

We conducted a comprehensive study on Marine Heatwaves (MHWs) over the Indian Ocean using high-resolution NOAA OISST V2 data (1981–2022). Our work focused on analyzing trends in frequency, duration (heatdays), and intensity of MHWs, and understanding their links to major climate drivers ENSO, Indian Ocean Dipole (IOD), and the Pacific–Japan (PJ) pattern. We identified significant increasing trends in MHW frequency and duration, especially in the Arabian Sea, Bay of Bengal, and southern Indian Ocean. Using Empirical Orthogonal Function (EOF) analysis, we captured dominant spatial variability patterns. Through partial correlations, Granger causality, and Convergent Cross Mapping (CCM), we established that ENSO is the primary driver of MHWs, exerting strong influence on all key metrics. The PJ pattern showed secondary but regionally important impacts, while the IOD had limited independent influence. Our dual-method causal framework enabled a deeper understanding of both linear and nonlinear relationships between climate models and MHWs. This work provides valuable insights for improving seasonal forecasting and informing marine resource management under climate change. Our study represents a significant advancement in climate-ocean research and contributes meaningfully to India's scientific leadership in understanding regional climate extremes.



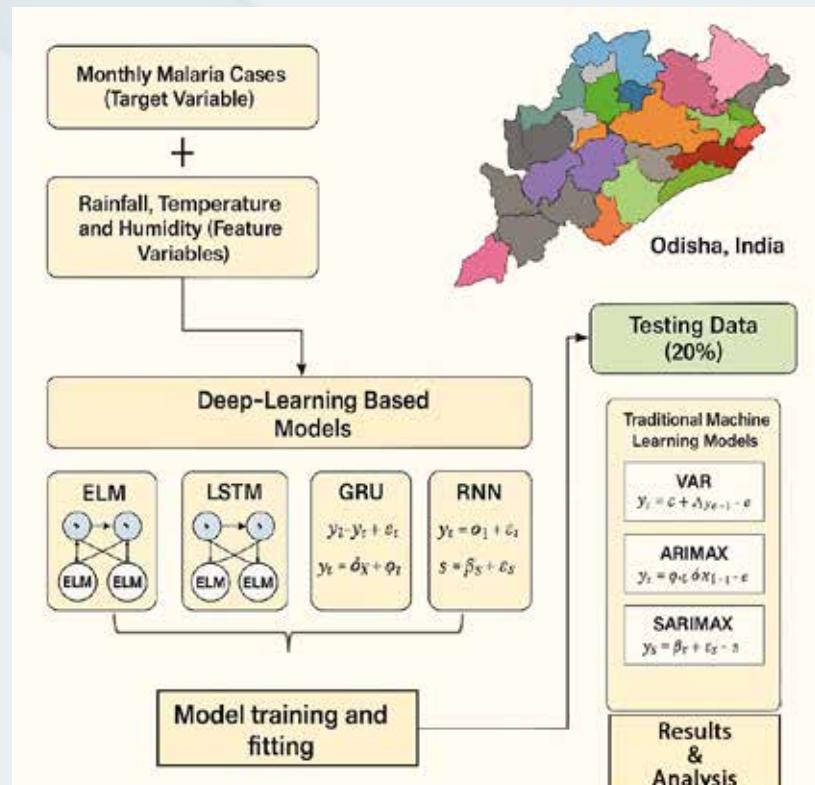
Reference:

J. Earth Syst Sci 2025, 134, 78

Forecasting malaria outbreaks using DL models

Dr. Arun Kumar V. and Dr. K.V. Ramesh

This study presents a pioneering approach to forecasting malaria outbreaks by leveraging advanced deep learning models on a comprehensive 15-year multivariate dataset from Odisha, India. The research is novel in integrating six key climatic variables rainfall, humidity, and temperature patterns with malaria incidence data across 30 districts, making it one of the most granular and extensive vector-borne disease forecasting efforts in India. Unlike prior studies that rely on short-term data or single models, this work evaluates and compares 11 statistical, machine learning, and deep learning models, including LSTM, GRU, CNN, and the cutting-edge Temporal Convolutional Network (TCN). The project's key advancement lies in the superior performance of deep learning models, particularly TCN and Extreme Learning Machine (ELM), which outperformed traditional methods in accuracy (R^2), and in minimizing errors (RMSE, MAE). TCN's ability to capture long-term dependencies using dilated convolutions enabled precise predictions even in districts with high case variability. Furthermore, the study introduces robust preprocessing (log transformation) and tailored hyperparameter optimization for each district, ensuring model robustness and generalizability. By aligning climate data with epidemiological patterns, this research sets a new benchmark in AI-driven disease surveillance, enabling real-time, district-level forecasting crucial for targeted interventions and health resource allocation.





The background features a white central area surrounded by a green organic shape. This green shape is composed of several irregular, wavy, and rounded white lines that create a liquid-like or cloud-like effect. The overall composition is minimalist and modern.

Science & Technology Services

Project Monitoring and Evaluation Division (PMED)



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(Senior Principal Scientist & Head)



Dr. Sunil Varughese
(Principal Scientist)



Dr. Sreeja Kumari
(Principal Scientist)



Dr. Deepa Balan
(Senior Scientist)



Mr. Ajit Prabhakaran
(Senior Technical Officer-2)



Mr. Chandra Shekar N.
(Executive Engineer)

Business Development Division (BDD)



Dr. Nishy P.
(Chief Scientist & Head)



Mr. Praveen Raj R. S.
(Senior Principal Scientist)



Dr. Srinivasan A.
(Senior Principal Scientist)

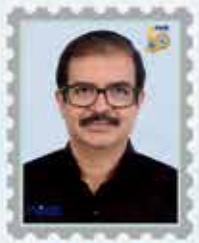


Dr. Praveen V. K.
(Principal Scientist)



Mr. Rahul L. R.
(Senior Technical Officer-1)

Information Technology Services Unit (ITSU)



Mr. Moni V.
(Senior Principal Scientist & Head)



Dr. Ribin Jones S. B.
(Senior Principal Scientist)



Mr. Pushkin S.
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Knowledge Resource Centre (KRC)



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(Chief Scientist & Head)



Mr. Rahul L. R.
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Mr. Nagasrinivasu G.
(Senior Technician-2)



Mr. Pushpakumar K. R.
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Central Instrumentation Facility Unit (CIFU)



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(Senior Principal Scientist)



Dr. Venkanna G.
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Mr. Kiran J.S.
(Senior Technical Officer-1)

Human Resource and Academic Division (HRAD)



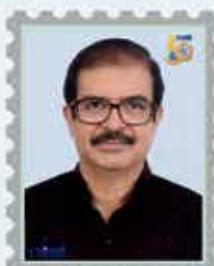
Dr. Hareesh U.S.
(Senior Principal Scientist & Head)



Dr. Pinaki Dey
(Senior Scientist)



Ms. Anila G.K.
(Technical Assistant)



Mr. Moni V.
(Senior Principal Scientist & Coordinator SDP)



Dr. Jayamurthy P.
(Senior Principal Scientist & Coordinator AcSIR)



Dr. Joshy Joseph
(Senior Principal Scientist & Coordinator Jigyasa)

Project Monitoring and Evaluation Division

The Project Monitoring and Evaluation Division (PMED) is a cornerstone of the Institute, driving effective oversight of project monitoring, evaluation, and resource management. Serving as the vital link between CSIR-NIIST and a wide array of partners—including central and state funding agencies, public and private R&D institutions, and universities across India—PMED ensures seamless collaboration and coordination.

PMED's mandate is comprehensive, encompassing the meticulous review and approval of new project proposals, continuous monitoring of ongoing projects to ensure alignment with objectives and timelines, and efficient allocation of resources and infrastructure. The division also oversees the recruitment of project personnel and ensures timely delivery of work packages and project milestones. In the past year, PMED successfully managed 100 Grant-In-Aid and 44 CSIR projects, with a combined budget of INR 12035 lakhs.

Beyond project execution, PMED plays a pivotal role in ensuring compliance with evolving Public Financial Management System (PFMS) requirements and facilitating smooth engagement with the Comptroller and Auditor General (CAG) and internal audits. The division provides critical updates and strategic insights to the Director, Management Council (MC), and Research Council (RC) on project progress and management. Additionally, PMED fosters robust stakeholder relationships by managing customer care, addressing CSIR-HQ requirements, preparing performance analyses, annual reports, and technology updates for the CSIR portal, and responding to Parliamentary queries.

Through its strategic oversight and stakeholder engagement, PMED ensures the efficient execution of projects and strengthens partnerships, significantly contributing to the Institute's success.

Business Development Division

The Business Development Division (BDD) of CSIR-NIIST serves as the vital bridge between the institute's scientific expertise and the needs of industry and society. By fostering collaborations, managing intellectual property, and driving technology commercialization, BDD plays a pivotal role in transforming innovative research into impactful real-world applications. BDD actively engages with a broad spectrum of stakeholders—CSIR-NIIST scientists, industrial partners, funding agencies, and government ministries—ensuring that the institute's knowledge base is effectively harnessed for both economic and societal benefit. With a dedicated team of professionals, the division is well-positioned to nurture partnerships, accelerate technology transfer, and create sustainable value through innovation.

Core Responsibilities

- **Strategic Alliances:** Facilitating industry partnerships through negotiations, collaborations, and contract projects, including sponsored research, consultancy assignments, and specialized testing and analytical services.
- **IP Management:** Safeguarding and leveraging intellectual property by assessing technology valuation, licensing know-how, and securing patents and copyrights.
- **CSR Engagements:** Channelling Corporate Social Responsibility (CSR) investments, as per Section 135, Schedule VII of the Companies Act 2013, to support cutting-edge R&D initiatives of CSIR-NIIST.

Showcasing NIIST

NIIST actively participated in several prestigious exhibitions, including the India International Science Festival (IISF) 2024 held at IIT Guwahati, World Food India 2024 at Pragati Maidan, New Delhi, the Agriculture & Food

Processing Growth Summit & Expo 2025 at NIFTEM Thanjavur, the Sustainable Agriculture & Food Processing Growth Summit & Expo 2025 at Kerala Agricultural University, Thrissur, and the Kerala Science Congress at Kerala Agricultural University, Thrissur.

Service Offerings

Through its comprehensive service portfolio, BDD provides tailored solutions to meet diverse industrial and societal needs, including:

- Development of new processes and products
- Generation of fundamental knowledge
- Troubleshooting and optimization of industrial processes
- Delivering innovative solutions to operational challenges

By combining scientific excellence with strategic vision, the Business Development Division continues to strengthen CSIR-NIIST's role as a trusted partner for industry and a catalyst for national development.

Knowledge Resource Center

The Knowledge Resource Centre (KRC) continues to play an indispensable role in bolstering the institute's research and development endeavours by ensuring seamless access to premium information resources and cutting-edge research support tools. Through the expansion of both print and digital collections—including patents, theses, standards, databases, and academic writing aids—the KRC has significantly strengthened the institute's research infrastructure.

Subscription and Resource Enhancements:

In the academic year 2024–25, the KRC enriched its collection with the acquisition of 101 new books, encompassing dissertations, along with 12 new e-books. The recently implemented Radio Frequency Identification (RFID) system is now fully operational, enhancing the security and efficiency of book circulation. Moreover, the institute has benefitted from the One Nation One Subscription (ONOS) initiative, gaining access to thousands of journals across multiple disciplines. This includes full-text access to prestigious publishers such as the American Chemical Society, Springer Nature, Oxford University Press, Taylor & Francis, and select subject collections from Elsevier.

Concurrently, the KRC continues to provide access to specialized databases and research platforms, including SciFinder, Web of Science, ASTM Standards, Qpat, and the ISO Custom Collection from BSB Edge. A significant addition this year is the Cambridge Structural Database (CSD), which serves as a vital tool for chemical and structural research. Complementing these resources are scholarly support tools such as Grammarly Premium, iThenticate for plagiarism detection, and BioRender for the creation of scientific illustrations.

Infrastructure and Digital Upgrades:

The institutional repository (IR) software, DSpace, alongside the library automation system, Koha, have been upgraded to their latest versions. The IR continues to be actively updated with institute publications, doctoral theses, and other scholarly outputs, ensuring enhanced accessibility and preservation of institutional knowledge.

User Engagement and Support:

The KRC has also conducted multiple training sessions and user support initiatives focusing on literature search techniques, prior art searches, and journal selection strategies. Additionally, trial access to the chemistry database *Science of Synthesis* was provided, complemented by a webinar dedicated to scientific writing.

In all, the Knowledge Resource Center remains committed to empowering the institute's research community by delivering robust access to high-quality journals, databases, and contemporary scholarly support services, thereby advancing the frontiers of research and innovation.

Central Instrumentation Facility Unit

The Central Instrumentation Facility Unit (CIFU) was established to provide professionally managed analytical services through a single-window system.

CIFU offers analytical support for:

- In-house research projects
- PhD scholars at CSIR-NIIST
- External clients, including industries, MSMEs, start-ups, and students from universities and colleges across India

As a central hub, CIFU manages service requests, sample analysis, customer support, and the upkeep of advanced instrumentation. CSIR-NIIST houses over 200 state-of-the-art analytical facilities, operated by skilled technicians and supported by scientists. The institute also holds NABL accreditation for testing dioxins and persistent organic pollutants (PoPs) in environmental, food, and feed samples, and provides specialized services such as biodegradability testing of materials in compliance with ISO 14855 and ISO 14985 standards.

Additionally, CSIR-NIIST has launched the Centre for Gold Assaying and Hallmarking, dedicated to standardized gold purity testing and hallmarking to strengthen the jewellery sector, ensure regulatory compliance, and build consumer trust. The institute is in the process of introducing hallmarking of precious metals and is expected to soon obtain BIS certification from the Bureau of Indian Standards.

Information Technology Services Unit

ITSU plays a vital role in supporting the core research, laboratory operations and administrative functions of CSIR NIIST. This unit ensures efficient operation, security, and advancement of all digital infrastructure and technology-related services. The laboratory is connected with two internet leased lines of 100 Mbps from NKN and another backup line of 100 Mbps from BSNL. All the buildings within the laboratory have been interconnected through a gigabit fibre optic backbone. Approximately 1,300 internet connections are available through both wired and wireless modes, which have been connected via various VLANs for enhanced performance. We have implemented cybersecurity policies and incident response plans, utilising firewalls, antivirus software, and access control. The IT infrastructure includes a data centre to maintain servers, a core switch, a firewall, and other IT devices to ensure uptime and performance, as well as to oversee internet connectivity and intranet systems. ITSU caters to the needs of researchers, technical, and administrative staff by providing a helpdesk and technical support for the maintenance of over 500 desktops, laptops, and other IT peripherals available in the laboratory.

The institute's website is regularly updated, showcasing its technologies, academics, and interdisciplinary research areas in English, Malayalam, and Hindi. The Institute Intranet portal caters to the needs of scientists and scholars in accessing information related to daily activities, circulars, news, and other relevant details. We have developed in-house applications for recruiting scientists and other permanent positions at CSIR NIIST. Additionally, we offer online portals for recruiting project assistants, registering candidates for internships and projects, and receiving applications for skill development programs.

ITSU manages the smooth functioning of the AADHAR-enabled biometric attendance system installed at different locations in the laboratory. The unit issues institutional identity cards to staff members, research scholars, and pensioners. We have installed a high-resolution LED Video wall in the auditorium for the dissemination of science and other scientific talks and lectures. A digital display system is also maintained at various locations within the

laboratory for displaying research outcomes, notices, and other relevant information. A printing and Scanning facility is provided to end users through a wide range of Heavy-Duty Colour Laser Printers and A3/A4 Scanners. As per the directives from CSIR, we have implemented e-Office to facilitate the movement of files and records, ensuring minimal manual handling of files and records. Additionally, we have implemented the eHRMS portal for managing human resources activities and leave records, as well as the ACCESS portal for Stores and Purchase purposes. We also maintain collaboration platform tools, such as MS Teams, and have set up video conferencing, remote desktop services, and file-sharing tools. We regularly perform backup, archival, and retrieval processes.

Human Resource and Academic Division

The Human Resource and Academic Division (HRAD) coordinates academic activities for all PhD students at CSIR-NIIST, including those supported by CSIR, UGC, DST/INSPIRE, and KSCSTE, ensuring smooth research progress. It also manages admissions for PG/UG project dissertations and internships, offering research opportunities to students from universities and colleges across India. HRAD conducts orientation and induction programs for newly recruited staff, organizes campus visits for school and college students on occasions like National Science Day and Technology Day, and hosts monthly institute seminars featuring NIIST researchers as well as eminent scientists from other institutions. Through the Jigyasa project, HRAD actively promotes student engagement in diverse science-related activities.

CSIR-NIIST also offers M.Sc. projects and internships to candidates from Chemical Sciences, Chemical Engineering, Environmental Engineering, Life Sciences, and Artificial Intelligence. These programs provide hands-on research training, exposure to good laboratory practices, scientific ethics, and career pathways. In the academic year 2023–24, the institute trained 477 postgraduate dissertation students and 180 interns, making a significant contribution to capacity building and professional development in science and technology.

Jigyasa is a significant initiative by CSIR aimed at fostering collaboration between schools and CSIR laboratories nationwide, to impart valuable research knowledge to educational institutions such as Kendriya Vidyalayas (KVS), Navodaya Vidyalayas (NVS), Karnataka State S&T Academy (KSTA), Atal Innovation Mission (AIM), NitiAayog, Indian Institute of Technology Bombay (IITB), NGOs, stakeholders, and individuals. The program seeks to enrich classroom instruction by providing students with well-structured, laboratory-based learning opportunities.

CSIR-NIIST Thiruvananthapuram has teamed up with CSIR-JIGYASA starting in 2022. The team organised teacher training programs, scientist-student connect programs, institutional visits, science fairs, and exhibitions, thereby bridging research with local schools and colleges. The years 2023-2024 have been particularly focused on enhancing science learning methodologies and supporting scientific initiatives in public schools and organizations to promote a scientific temper and nurture inquisitive learning. Key activities encompassed scientist-student interaction programs for Kendriya Vidyalayas, a Two-Phase Summer Camp for High School students, Jigyasa-Future Innovator's Program for KV Schools, Single Use Plastic and Food Package Wraps Awareness Campaign at Govt. Schools, KAMP-associated Scientist-student Interaction, India International Science Festival- Students Science & Technology Village 2024, LENS Balasastra Congress 2024, and Science Exposure Program.

CSIR-NIIST Jigyasa successfully conducted 44 programs in the year 2024-2025, engaging with 419 institutions and benefiting 6066 students and 638 teachers.

Placement Cell CSIR-NIIST is committed to developing and enhancing technology to benefit humanity. With nearly fifty years of expertise, we have consistently evolved to provide a well-rounded educational experience and exposure for our students. Recognizing the need for skilled professionals in the current global and dynamic industries, our interdisciplinary research programs prepare students with the essential skills to thrive in diverse work settings. Explore our research programs and discover the talented individuals ready to drive progress to new heights.

Skill Development Program The CSIR-National Institute for Interdisciplinary Science and Technology (CSIR-NIIST), a constituent laboratory of CSIR, has implemented the "Integrated Skill Initiative" to offer skill development and upskilling courses for undergraduates, postgraduates, unemployed youth, and industry personnel. These programs emphasize knowledge generation, hands-on training in the operation and maintenance of sophisticated equipment, and personality development, aiming to bridge the gap between academia and industry while fostering entrepreneurship and employability. Training modules combine theory, practical sessions, group discussions, and case studies, giving equal weight to both conceptual and experiential learning.

The initiative has delivered impactful programs in diverse areas such as Food Processing and Analytical Techniques, IPR and Patent Filing, Polymer Science, NMR Spectroscopy, Life Cycle Assessment, Synthetic Organic Chemistry, Remote Sensing & GIS, Artificial Intelligence in Bioprocessing, Herbal Drug Development, and Biofuels (under ESDP-MSME sponsorship). During 2024–2025, CSIR-NIIST conducted 18 national-level training programs, benefitting 1,038 participants from both urban and rural regions, thereby contributing to skill enhancement, job creation, and sustainable economic growth.

परियोजना निगरानी और मूल्यांकन प्रभाग (पीएमईडी)

परियोजना निगरानी एवं मूल्यांकन प्रभाग (पीएमईडी) संस्थान का एक प्रमुख स्तंभ है, जो परियोजना निगरानी, मूल्यांकन तथा संसाधन प्रबंधन की प्रभावी देखरेख सुनिश्चित करता है। यह प्रभाग सीएसआईआर-एनआईआईएसटी और विभिन्न भागीदारों-जैसे केंद्रीय एवं राज्य वित्तपोषण एजेंसियाँ, सार्वजनिक एवं निजी अनुसंधान एवं विकास संस्थान तथा भारत भर के विश्वविद्यालय-के बीच एक महत्वपूर्ण सेतु के रूप में कार्य करता है, जिससे सुचारु सहयोग और समन्वय सुनिश्चित होता है।

पीएमईडी का कार्यक्षेत्र व्यापक है, जिसमें नई परियोजना प्रस्तावों की सूक्ष्म समीक्षा एवं अनुमोदन, चल रही परियोजनाओं की निरंतर निगरानी ताकि वे निर्धारित उद्देश्यों एवं समय-सीमाओं के अनुरूप रहें, तथा संसाधनों एवं अवसंरचना का कुशल आवंटन शामिल है। यह प्रभाग परियोजना कार्मिकों की भर्ती की देखरेख करता है और कार्य-पैकेजों तथा परियोजना उपलब्धियों की समय पर आपूर्ति सुनिश्चित करता है। विगत वर्ष में पीएमईडी ने कुल 100 अनुदान सहायता परियोजनाओं एवं 44 सीएसआईआर परियोजनाओं का सफलतापूर्वक प्रबंधन किया, जिनका संयुक्त बजट ₹12,035 लाख रहा।

परियोजना निष्पादन के अतिरिक्त, पीएमईडी सार्वजनिक वित्तीय प्रबंधन प्रणाली (पीएफएमएस) की परिवर्तित आवश्यकताओं के अनुपालन को सुनिश्चित करने तथा नियंत्रक एवं महात्मेखा परीक्षक (सीएजी) और आंतरिक लेखा-परीक्षा के साथ सुचारु समन्वय में भी महत्वपूर्ण भूमिका निभाता है। यह प्रभाग परियोजनाओं की प्रगति एवं प्रबंधन से संबंधित महत्वपूर्ण अद्यतन एवं रणनीतिक जानकारी निदेशक, प्रबंधन परिषद् (एमसी) तथा अनुसंधान परिषद् (आरसी) को प्रदान करता है।

इसके अलावा, पीएमईडी हितधारकों के साथ सुदृढ़ संबंधों को बढ़ावा देता है, जिसमें ग्राहक सेवा प्रबंधन, सीएसआईआर मुख्यालय की आवश्यकताओं का निस्तारण, प्रदर्शन विश्लेषण, वार्षिक प्रतिवेदन एवं सीएसआईआर पोर्टल हेतु प्रौद्योगिकी अद्यतन तैयार करना तथा संसदीय प्रश्नों का उत्तर देना शामिल है।

अपने रणनीतिक पर्यवेक्षण और प्रभावी हितधारक सहभागिता के माध्यम से, पीएमईडी परियोजनाओं के कुशल क्रियान्वयन को सुनिश्चित करता है और संस्थान की सफलता में महत्वपूर्ण योगदान देता है।

व्यवसाय विकास प्रभाग (बीडीडी)

सीएसआईआर-एनआईआईएसटी का व्यवसाय विकास प्रभाग संस्थान की वैज्ञानिक विशेषज्ञता और उद्योग एवं समाज की आवश्यकताओं के बीच एक महत्वपूर्ण सेतु के रूप में कार्य करता है। सहयोग को बढ़ावा

देकर, बौद्धिक संपदा का प्रबंधन करके तथा प्रौद्योगिकी के व्यावसायीकरण को गति देकर, बीडीडी नवोन्मेषी अनुसंधान को प्रभावशाली वास्तविक अनुप्रयोगों में रूपांतरित करने में अहम भूमिका निभाता है। बीडीडी, सीएसआईआर-एनआईआईएसटी के वैज्ञानिकों, औद्योगिक भागीदारों, वित्तपोषण एजेंसियों और सरकारी मंत्रालयों सहित विभिन्न हितधारकों के साथ सक्रिय रूप से जुड़ा रहता है, जिससे संस्थान के ज्ञान संसाधनों का प्रभावी उपयोग आर्थिक और सामाजिक दोनों लाभों के लिए सुनिश्चित किया जा सके। समर्पित पेशेवरों की एक सक्षम टीम के साथ, यह प्रभाग साझेदारियों को सुदृढ़ करने, प्रौद्योगिकी हस्तांतरण को तीव्र करने और नवाचार के माध्यम से सतत मूल्य सृजन के लिए अनुकूल रूप से स्थापित है।

मुख्य दायित्व

- रणनीतिक गठबंधन:** उद्योग के साथ वार्ता, सहयोग और संविदा परियोजनाओं के माध्यम से साझेदारियों को सुगम बनाना, जिसमें प्रायोजित अनुसंधान, परामर्श कार्य तथा विशेष परीक्षण एवं विश्लेषण सेवाएँ शामिल हैं।
- बौद्धिक संपदा प्रबंधन:** प्रौद्योगिकी के मूल्यांकन, तकनीकी ज्ञान के लाइसेंसिंग तथा पेटेंट और कॉपीराइट के संरक्षण के माध्यम से बौद्धिक संपदा की सुरक्षा एवं उपयोग।
- सहभागिता:** कंपनी अधिनियम, 2013 की धारा 135 एवं अनुसूची VII के अनुसार, कॉर्पोरेट सामाजिक उत्तरदायित्व (सीएसआर) निवेशों को सीएसआईआर-एनआईआईएसटी की अत्याधुनिक अनुसंधान एवं विकास पहलों के समर्थन हेतु निर्देशित करना।

एनआईआईएसटी का प्रदर्शन

एनआईआईएसटी ने कई प्रतिष्ठित प्रदर्शनियों में सक्रिय भागीदारी की, जिनमें भारत अंतर्राष्ट्रीय विज्ञान महोत्सव (आईआईएसएफ) 2024, IIT गुवाहाटी, विश्व खाद्य भारत 2024, प्रगति मैदान, नई दिल्ली, कृषि और खाद्य प्रसंस्करण विकास शिखर सम्मेलन और एक्सपो 2025, NIFTEM तंजावुर, सतत कृषि और खाद्य प्रसंस्करण विकास शिखर सम्मेलन और एक्सपो 2025, केरल कृषि विश्वविद्यालय, त्रिशूर, तथा केरल साइंस कांग्रेस, केरल कृषि विश्वविद्यालय, त्रिशूर शामिल हैं।

सेवा प्रस्ताव

अपने व्यापक सेवा पोर्टफोलियो के माध्यम से, बीडीडी उद्योग और समाज की विविध आवश्यकताओं को पूरा करने हेतु अनुकूलित समाधान प्रदान करता है, जिनमें शामिल हैं:

- नई प्रक्रियाओं तथा उत्पादों का विकास
- मौलिक ज्ञान का सृजन
- औद्योगिक प्रक्रियाओं का समाधान और अनुकूलन
- परिचालनात्मक चुनौतियों के लिए अभिनव समाधान प्रदान करना

वैज्ञानिक उत्कृष्टता और रणनीतिक दृष्टि के समन्वय के माध्यम से, व्यवसाय विकास प्रभाग उद्योग के लिए सीएसआईआर-एनआईआईएसटी को विश्वसनीय साझेदार तथा राष्ट्रीय विकास के लिए एक प्रेरक शक्ति के रूप में सुदृढ़ करता है।

ज्ञान संसाधन केंद्र (केआरसी)

ज्ञान संसाधन केंद्र संस्थान की अनुसंधान एवं विकास गतिविधियों को सुदृढ़ करने में एक अनिवार्य भूमिका

निभाता रहा है। यह केंद्र उच्च-स्तरीय सूचना संसाधनों और अत्याधुनिक अनुसंधान सहायता उपकरणों तक निर्बाध पहुँच सुनिश्चित करके संस्थान के अनुसंधान परिस्थितिकी तंत्र को मजबूती प्रदान करता है। मुद्रित और डिजिटल दोनों प्रकार के संग्रहों—जिनमें पेटेंट, शोध-प्रबंध, मानक, डेटाबेस तथा अकादमिक लेखन सहायक उपकरण शामिल हैं—के विस्तार के माध्यम से, केआरसी ने संस्थान की अनुसंधान अवसंरचना को उल्लेखनीय रूप से सुदृढ़ किया है।

सदस्यता और संसाधन सुधार:

शैक्षणिक वर्ष 2024-25 के दौरान, ज्ञान संसाधन केंद्र (केआरसी) ने अपने संग्रह को सुदृढ़ करते हुए 101 नई पुस्तकों (शोध-प्रबंध सहित) तथा 12 नई ई-पुस्तकों का अधिग्रहण किया। हाल ही में लागू की गई रेडियो फ्रीकवैंसी आइडैटिफिकेशन (आरएफआईडी) प्रणाली अब पूर्णतः क्रियाशील है, जिससे पुस्तकों के निर्गमन में सुरक्षा और दक्षता में उल्लेखनीय वृद्धि हुई है। इसके अतिरिक्त, संस्थान को वन नेशन, वन सब्सक्रिप्शन (ओएनओएस) पहल के अंतर्गत बहुविषयक क्षेत्रों की हजारों पत्रिकाओं तक पहुँच प्राप्त हुई है। इसमें अमेरिकन केमिकल सोसाइटी, स्प्रिंगर नेचर, ऑक्सफोर्ड यूनिवर्सिटी प्रेस, टेलर एंड फ्रांसिस तथा एल्सेवियर की चयनित विषय-संग्रहों की पूर्ण-पाठ (फुल-टेक्स्ट) पहुँच शामिल है।

साथ ही, ज्ञान संसाधन केंद्र (केआरसी) SciFinder, Web of Science, ASTM Standards, Qpat तथा BSB Edge से आईएसओ कस्टम कलेक्शन जैसे विशेषीकृत डेटाबेस और अनुसंधान मंचों तक निरंतर पहुँच प्रदान करता रहा है। इस वर्ष एक महत्वपूर्ण नवीन समावेशन के रूप में कैम्ब्रिज स्ट्रक्चरल डेटाबेस (सीएसडी) को जोड़ा गया है, जो रासायनिक एवं संरचनात्मक अनुसंधान के लिए एक अत्यंत उपयोगी उपकरण है। इन संसाधनों के पूरक के रूप में, Grammarly Premium, साहित्यिक चोरी की पहचान हेतु iThenticate, तथा वैज्ञानिक चित्रण के निर्माण के लिए BioRender जैसे अकादमिक सहायता उपकरण भी उपलब्ध कराए गए हैं।

अवसंरचना और डिजिटल उन्नयन:

संस्थानात्मक रिपॉजिटरी (IR) सॉफ्टवेयर DSpace और पुस्तकालय स्वचालन प्रणाली Koha को उनके नवीनतम संस्करणों में उन्नत किया गया है। संस्थानिक रिपॉजिटरी में संस्थान के प्रकाशनों, डॉक्टोरल शोध-प्रबंधों तथा अन्य शैक्षणिक उपलब्धियों को निरंतर अद्यतन किया जा रहा है, जिससे संस्थानिक ज्ञान की बेहतर अभिगम्यता और दीर्घकालिक संरक्षण सुनिश्चित हो सके।

उपयोगकर्ता सहभागिता और सहायता:

केआरसी ने साहित्य खोज तकनीकों, पूर्व कला खोज, और जर्नल चयन रणनीतियों पर ध्यान केंद्रित करते हुए कई प्रशिक्षण सत्र और उपयोगकर्ता समर्थन पहलों भी आयोजित की हैं। इसके अतिरिक्त, रसायन विज्ञान डेटाबेस Science of Synthesis की परीक्षण अवधि (ट्रायल एक्सेस) भी प्रदान की गई, जिसके साथ वैज्ञानिक लेखन पर केंद्रित एक वेबिनार का आयोजन किया गया।

समग्र रूप से, ज्ञान संसाधन केंद्र उच्च गुणवत्ता वाली पत्रिकाओं, डेटाबेसों तथा आधुनिक अकादमिक सहायता सेवाओं तक सुदृढ़ पहुँच प्रदान करके संस्थान के अनुसंधान समुदाय को सशक्त बनाने के लिए प्रतिबद्ध है, और इस प्रकार अनुसंधान एवं नवाचार की सीमाओं को निरंतर आगे बढ़ा रहा है।

केंद्रीय उपकरण सुविधा इकाई (सीआईएफयू)

केंद्रीय उपकरण सुविधा इकाई (सीआईएफयू) की स्थापना एक सिंगल-विंडो प्रणाली के माध्यम से पेशेवर रूप

से प्रबंधित विश्लेषणात्मक सेवाएँ प्रदान करने के उद्देश्य से की गई है। सीआईएफयू निम्नलिखित के लिए विश्लेषणात्मक सहायता प्रदान करती है:

- संस्थान में अनुसंधान परियोजनाएँ
- सीएसआईआर-एनआईआईएसटी के पीएचडी शोधार्थी
- बाहरी ग्राहक, जिनमें उद्योग, एमएसएमई, स्टार्ट-अप तथा भारत भर के विश्वविद्यालयों और महाविद्यालयों के छात्र शामिल हैं।

एक केंद्रीय केंद्र के रूप में, सीआईएफयू सेवा अनुरोधों का प्रबंधन, नमूना विश्लेषण, ग्राहक सहायता तथा उन्नत उपकरणों के रखरखाव का दायित्व निभाता है। सीएसआईआर-एनआईआईएसटी में 200 से अधिक अत्याधुनिक विश्लेषणात्मक सुविधाएँ उपलब्ध हैं, जिन्हें कुशल तकनीशियनों द्वारा संचालित किया जाता है और वैज्ञानिकों का सहयोग प्राप्त होता है। संस्थान को पर्यावरण, खाद्य एवं पशु आहार नमूनों में डाइऑक्सिन और स्थायी जैविक प्रदूषक (PoPs) के परीक्षण हेतु एनएबीएल मान्यता प्राप्त है। इसके अतिरिक्त, संस्थान आईएसओ 14855 और आईएसओ 14985 मानकों के अनुरूप सामग्रियों की जैव-अपघटनीयता परीक्षण जैसी विशेषीकृत सेवाएँ भी प्रदान करता है।

इसके अतिरिक्त, सीएसआईआर-एनआईआईएसटी ने स्वर्ण परीक्षण एवं हॉलमार्किंग केंद्र की स्थापना की है, जो आभूषण क्षेत्र को सुदृढ़ करने, विनियामक अनुपालन सुनिश्चित करने तथा उपभोक्ता विश्वास बढ़ाने के उद्देश्य से स्वर्ण शुद्धता के मानकीकृत परीक्षण और हॉलमार्किंग के लिए समर्पित है। संस्थान कीमती धातुओं की हॉलमार्किंग सेवाएँ आरंभ करने की प्रक्रिया में हैं और शीघ्र ही भारतीय मानक ब्यूरो (बीआईएस) से प्रमाणन प्राप्त करने की अपेक्षा की जा रही है।

सूचना प्रौद्योगिकी सेवाएँ इकाई (आईटीएसयू)

सूचना प्रौद्योगिकी सेवा इकाई सीएसआईआर-एनआईआईएसटी की मूल अनुसंधान गतिविधियों, प्रयोगशाला संचालन तथा प्रशासनिक कार्यों के समर्थन में महत्वपूर्ण भूमिका निभाती है। यह इकाई संस्थान की समस्त डिजिटल अवसंरचना और प्रौद्योगिकी से संबंधित सेवाओं के कुशल संचालन, सुरक्षा तथा उन्नयन को सुनिश्चित करती है। प्रयोगशाला को राष्ट्रीय ज्ञान नेटवर्क (NKN) से 100 Mbps की दो इंटरनेट लीज़ड लाइनों तथा बीएसएनएल से 100 Mbps की एक बैक-अप लाइन के माध्यम से इंटरनेट कनेक्टिविटी प्रदान की गई है। प्रयोगशाला परिसर के सभी भवनों को गीगाबिट फ़ाइबर ऑप्टिक बैकबोन के माध्यम से आपस में जोड़ा गया है। वर्तमान में लगभग 1300 से अधिक इंटरनेट कनेक्शन (वायर्ड एवं वायरलेस दोनों) उपलब्ध हैं, जिन्हें बेहतर प्रदर्शन के लिए विभिन्न VLANs के माध्यम से जोड़ा गया है। संस्थान में फ़ायरवॉल, एंटीवायरस सॉफ्टवेयर तथा एक्सेस कंट्रोल के माध्यम से साइबर सुरक्षा नीतियाँ और घटना प्रतिक्रिया योजनाएँ लागू की गई हैं। आईटी अवसंरचना में एक समर्पित डेटा सेंटर शामिल है, जिसमें सर्वर, कोर स्विच, फ़ायरवॉल तथा अन्य आईटी उपकरण स्थापित हैं, जिससे नेटवर्क अपटाइम और प्रदर्शन सुनिश्चित किया जा सके, साथ ही इंटरनेट कनेक्टिविटी और इंट्रानेट प्रणालियों की निगरानी की जा सके। आईटीएसयू शोधकर्ताओं, तकनीकी एवं प्रशासनिक कर्मचारियों की आवश्यकताओं की पूर्ति हेतु हेल्पडेस्क और तकनीकी सहायता प्रदान करता है तथा प्रयोगशाला में उपलब्ध 500 से अधिक डेस्कटॉप, लैपटॉप और अन्य आईटी परिधीय उपकरणों के रखरखाव का दायित्व भी निभाता है।

संस्थान की वेबसाइट को नियमित रूप से अद्यतन किया गया है, जिसमें प्रौद्योगिकियों, शैक्षणिक गतिविधियों तथा अंतर्विषयक अनुसंधान क्षेत्रों को अंग्रेजी, मलयालम और हिंदी में प्रदर्शित किया जाता है। संस्थान का

इंट्रानेट पोर्टल वैज्ञानिकों और शोधार्थियों की दैनिक गतिविधियों, परिपत्रों, समाचारों तथा अन्य आवश्यक सूचनाओं से संबंधित आवश्यकताओं की पूर्ति करता है। सीएसआईआर-एनआईआईएसटी में वैज्ञानिकों तथा अन्य स्थायी पदों की भर्ती के लिए इन-हाउस अनुप्रयोगों का विकास किया गया है। इसके अतिरिक्त, परियोजना सहायक भर्ती, इंटर्नशिप एवं परियोजनाओं के लिए अभ्यर्थियों का पंजीकरण, तथा कौशल विकास कार्यक्रमों हेतु आवेदन प्राप्त करने के लिए ऑनलाइन पोर्टल भी उपलब्ध कराए गए हैं।

आईटीएसयू प्रयोगशाला के विभिन्न स्थानों पर स्थापित आधार-सक्षम बायोमेट्रिक उपस्थिति प्रणाली के सुचारु संचालन का प्रबंधन करता है। यह इकाई कर्मचारियों, शोधार्थियों तथा पैशनभोगियों के लिए संस्थागत पहचान पत्र जारी करती है। विज्ञान के प्रचार-प्रसार तथा वैज्ञानिक व्याख्यानों और चर्चाओं के प्रसारण हेतु सभागार में उच्च विभेदन एलईडी वीडियो वॉल स्थापित की गई है। इसके अतिरिक्त, प्रयोगशाला परिसर के विभिन्न स्थानों पर डिजिटल डिस्प्ले प्रणाली का रखरखाव किया जाता है, जिसके माध्यम से अनुसंधान उपलब्धियों, सूचनाओं एवं नोटिसों का प्रदर्शन किया जाता है। उपयोगकर्ताओं को हेवी-ड्यूटी कलर लेज़र प्रिंटर तथा A3/A4 स्कैनर की विस्तृत श्रृंखला के माध्यम से मुद्रण एवं स्कैनिंग सुविधाएँ प्रदान की जाती हैं। सीएसआईआर के निर्देशों के अनुसार, फाइलों एवं अभिलेखों की आवाजाही के लिए ई-ऑफिस प्रणाली को लागू किया गया है, जिससे मैनुअल फाइलों एवं अभिलेखों की न्यूनतम आवाजाही सुनिश्चित होती है। इसके अतिरिक्त, मानव संसाधन गतिविधियों एवं अवकाश अभिलेखों के प्रबंधन हेतु eHRMS पोर्टल, तथा भंडार एवं क्रय कार्यों के लिए ACCESS पोर्टल को भी कार्यान्वित किया गया है। आईटीएसयू द्वारा MS Teams जैसे सहयोगात्मक मंचों का रखरखाव किया जाता है, तथा वीडियो कॉन्फ्रेंसिंग, रिमोट डेस्कटॉप सेवाएँ और फ़ाइल शेयरिंग उपकरण भी स्थापित किए गए हैं। साथ ही, डेटा की सुरक्षा सुनिश्चित करने के लिए नियमित बैकअप, अभिलेखीकरण और पुनर्प्राप्ति प्रक्रियाएँ अपनाई जाती हैं।

मानव संसाधन और शैक्षिक विभाग

मानव संसाधन एवं शैक्षणिक प्रभाग (एचआरएडी) सीएसआईआर-एनआईआईएसटी में सभी पीएचडी छात्रों की शैक्षणिक गतिविधियों का समन्वय करता है, जिनमें सीएसआईआर, यूजीसी, डीएसटी/इन्सपाइर तथा केएससीएसटीई द्वारा समर्थित छात्र शामिल हैं, ताकि उनके अनुसंधान की प्रगति सुचारु रूप से सुनिश्चित की जा सके। यह प्रभाग स्नातकोत्तर/स्नातक परियोजना शोध-प्रबंधों तथा इंटर्नशिप के लिए प्रवेश प्रक्रियाओं का भी प्रबंधन करता है, जिससे भारत भर के विश्वविद्यालयों और महाविद्यालयों के विद्यार्थियों को अनुसंधान के अवसर प्राप्त होते हैं। एचआरएडी नव-नियुक्त कर्मचारियों के लिए अभिमुखीकरण एवं प्रेरण कार्यक्रम आयोजित करता है, राष्ट्रीय विज्ञान दिवस और प्रौद्योगिकी दिवस जैसे अवसरों पर विद्यालय एवं महाविद्यालय के छात्रों के लिए परिसर भ्रमण कार्यक्रमों का आयोजन करता है, तथा प्रत्येक माह संस्थान सेमिनारों का आयोजन करता है, जिनमें एनआईआईएसटी के शोधकर्ता एवं अन्य संस्थानों के प्रतिष्ठित वैज्ञानिक व्याख्यान देते हैं। जिजासा परियोजना के माध्यम से एचआरएडी विभिन्न विज्ञान-संबंधी गतिविधियों में छात्रों की सक्रिय सहभागिता को प्रोत्साहित करता है।

इसके अतिरिक्त, सीएसआईआर-एनआईआईएसटी रसायन विज्ञान, रासायनिक अभियांत्रिकी, पर्यावरण अभियांत्रिकी, जीवन विज्ञान और कृत्रिम बुद्धिमत्ता जैसे विषयों से संबंधित अभ्यर्थियों को एम.एससी. परियोजनाएँ और इंटर्नशिप प्रदान करता है। ये कार्यक्रम छात्रों को व्यावहारिक अनुसंधान प्रशिक्षण, उत्तम प्रयोगशाला प्रथाओं, वैज्ञानिक नैतिकता तथा करियर मार्गों से परिचित कराते हैं। शैक्षणिक वर्ष 2023-24 के दौरान, संस्थान ने 477 स्नातकोत्तर शोध-प्रबंध छात्रों तथा 180 इंटर्न्स को प्रशिक्षण प्रदान किया, जिससे विज्ञान एवं प्रौद्योगिकी के क्षेत्र में क्षमता निर्माण और व्यावसायिक विकास में महत्वपूर्ण योगदान हुआ।

जिजासा: सीएसआईआर की एक महत्वपूर्ण पहल है, जिसका उद्देश्य देशभर के विद्यालयों और सीएसआईआर प्रयोगशालाओं के बीच सहयोग को सुदृढ़ करना है, ताकि केंद्रीय विद्यालय (केवीएस), नवोदय विद्यालय (एनवीएस), कर्णटक राज्य विज्ञान एवं प्रौद्योगिकी अकादमी (केएसटीए), अटल नवाचार मिशन (एआईएम), नीति आयोग, भारतीय प्रौद्योगिकी संस्थान बॉम्बे (आईआईटीबी), गैर-सरकारी संगठनों (एनजीओ), हितधारकों तथा आम नागरिकों जैसे शैक्षणिक संस्थानों और भागीदारों को उपयोगी अनुसंधान ज्ञान प्रदान किया जा सके। यह कार्यक्रम छात्रों को सुव्यवस्थित, प्रयोगशाला-आधारित शिक्षण अवसर उपलब्ध कराकर कक्षा शिक्षण को समृद्ध बनाने का प्रयास करता है।

सीएसआईआर-एनआईआईएसटी, तिरुवनंतपुरम ने 2022 से सीएसआईआर-जिजासा के साथ सहयोग किया है। इस टीम ने शिक्षक प्रशिक्षण कार्यक्रम, वैज्ञानिक-छात्र संपर्क कार्यक्रम, संस्थागत भ्रमण, विज्ञान मेले और प्रदर्शनियों का आयोजन किया, जिससे स्थानीय स्कूलों और कॉलेजों में अनुसंधान को जोड़ा जा सके। वर्ष 2023-2024 विशेष रूप से विज्ञान सीखने की विधियों को बढ़ाने और सरकारी स्कूलों और संगठनों में वैज्ञानिक पहलों का समर्थन करने पर केंद्रित था, ताकि वैज्ञानिक मानसिकता को बढ़ावा दिया जा सके और जिजासा सीखने को प्रोत्साहित किया जा सके। मुख्य गतिविधियों में केंद्रीय विद्यालयों के लिए वैज्ञानिक-छात्र संवाद कार्यक्रम, उच्च विद्यालय के छात्रों के लिए दो-चरणीय ग्रीष्मकालीन शिविर, केवी स्कूलों के लिए जिजासा-भविष्य नवप्रवर्तक कार्यक्रम, सरकारी स्कूलों में सिंगल यूज प्लास्टिक और फूड पैकेज रैप जागरूकता अभियान, केएमपी से जुड़े वैज्ञानिक-छात्र इंटरेक्शन, भारत अंतर्राष्ट्रीय विज्ञान महोत्सव - छात्र विज्ञान एवं प्रौद्योगिकी ग्राम 2024, एलईएनएस बालसांत्रा कांग्रेस 2024 और विज्ञान एक्सपोजर कार्यक्रम शामिल थे। सीएसआईआर-एनआईआईएसटी जिजासा ने वर्ष 2024-2025 में 44 कार्यक्रम सफलतापूर्वक आयोजित किए, जिसमें 419 संस्थाओं ने भाग लिया और 6066 छात्रों तथा 638 शिक्षकों को लाभ मिला।

रोजगार प्रकोष्ठ: सीएसआईआर-एनआईआईएसटी मानवता के लाभ के लिए प्रौद्योगिकी विकसित करने और उसे बढ़ावा देने के लिए प्रतिबद्ध है। लगभग पचास वर्षों के अनुभव के साथ, हम लगातार विकसित होते रहे हैं ताकि अपने छात्रों को समग्र शैक्षिक अनुभव और exposure प्रदान किया जा सके। वर्तमान वैशिक और गतिशील उद्योगों में कौशल पेशेवरों की आवश्यकता को पहचानते हुए, हमारे अंतर्विषयक अनुसंधान कार्यक्रम छात्रों को विविध कार्य परिवेशों में सफलता पाने के लिए आवश्यक कौशल से तैयार करते हैं। हमारे अनुसंधान कार्यक्रमों का अन्वेषण करें और उन प्रतिभाशाली व्यक्तियों को खोजें, जो प्रगति को नई ऊँचाइयों तक ले जाने के लिए तैयार हैं।

कौशल विकास कार्यक्रम: सीएसआईआर-राष्ट्रीय अंतर्विषयक विज्ञान और प्रौद्योगिकी संस्थान (सीएसआईआर-एनआईआईएसटी), जो सीएसआईआर की एक सहायक प्रयोगशाला है, ने “एकीकृत कौशल पहल” को लागू किया है ताकि पूर्वस्नातक, स्नातकोत्तर, बेरोज़गार युवा और उद्योग कर्मियों के लिए कौशल विकास और कौशल विकास पाठ्यक्रम प्रदान किए जा सकें। ये कार्यक्रम ज्ञान सृजन, उन्नत उपकरणों के संचालन और रखरखाव में व्यावहारिक प्रशिक्षण, और व्यक्तित्व विकास पर जोर देते हैं। इसका उद्देश्य अकादमिक और उद्योग के बीच अंतर को कम करना और उद्यमिता व रोजगार योग्यता को बढ़ावा देना है। प्रशिक्षण मॉड्यूल में सिद्धांत, व्यावहारिक सत्र, समूह चर्चा और केस स्टडी शामिल हैं, जिससे सैद्धांतिक और अनुभवात्मक सीखने दोनों को समान महत्व दिया जाता है।

इस पहल ने खाद्य प्रसंस्करण और विश्लेषणात्मक तकनीकें, आईपीआर और पेटेंट फाइलिंग, पॉलिमर विज्ञान, एनएमआर स्पेक्ट्रोस्कोपी, लाइफ सायकल असेसमेंट, सिंथेटिक ऑर्गेनिक केमिस्ट्री, रिमोट सेंसिंग और जीआईएस, जैव प्रसंस्करण में कृत्रिम बुद्धिमत्ता, हर्बल दवा विकास, और जैव ईंधन (ईएसडीपी-एमएमई

प्रायोजन के तहत) जैसे विविध क्षेत्रों में प्रभावशाली कार्यक्रम प्रदान किए हैं। वर्ष 2024-2025 के दौरान, सीएसआईआर-एनआईआईएसटी ने 18 राष्ट्रीय स्तर के प्रशिक्षण कार्यक्रम आयोजित किए, जिनसे शहरी और ग्रामीण क्षेत्रों के 1,038 प्रतिभागियों को लाभ मिला। इस प्रकार, यह पहल कौशल वृद्धि, रोजगार सृजन और सतत आर्थिक विकास में योगदान देने में सक्षम रही।

AcSIR Ph.D. awarded from 1st April 2024 to 31st March 2025

Sl. No.	Enrolment No.	Name	Thesis Title	Supervising Guide/ Co-guide	Date of Viva- Voce Exam
	10BB17A39014	Dr. Sannya Sathyan	Pickering emulsion based encapsulates stabilized by porous starch for bioactive delivery	Dr. Nisha P.	08.04.2024
	10CC18A39011	Dr. Drishya Elizebath K.	Molecular insight into the hierarchically organized self-assembled π -systems: Structure, dynamics, and functions	Dr. Praveen V. K.	09.04.2024
	10BB17A39023	Dr. Navami M. M.	Millet starch as food-grade Pickering particles in emulsion stabilization: Fabrication, characterization and application Studies	Dr. Nisha P.	29.04.2024
	10CC18A39017	Dr. Jiffin Sam	Development of zero discharge ultrahigh lime with aluminium process for anionic contaminants – A step towards circular economy	Dr. Prathish K. P.	30.04.2024
	20EE20A39002	Dr. Venkatesh T	Semi-automation of non-centrifugal sugars (NCS) production units – experimental, modeling and scale-up studies	Dr. Anjineyulu Kothakota / Dr. Sajeev M. S.	30.04.2024
	10CC18A39008	Dr. Rahul P.	Exploration and development of facile strategies towards quinoline derivatives	Dr. Jubi John / Dr. Praveen V. K.	01.05.2024
	10CC19A39005	Dr. Kirankumar P. S.	Development of GC-MS/MS based affordable confirmatory analytical methodology for dioxins and PCBs in fish and fish products and exploration of a sustainable decontamination strategy	Dr. Prathish K. P.	01.05.2024
	20EE18A39023	Dr. Jithu Jayaraj	Rare-Earth Phosphate Based Engineering Coatings on AZ31 Magnesium Alloy for Anticorrosion and Biomaterial Applications	Dr. Srinivasan A. / Dr. Raghu K. G.	03.05.2024
	10CC18A39002	Dr. Anjali Krishna P. K.	Exploration of aromaticity, through-space effect, and nature of CC bonds in chemistry using molecular electrostatic potential analysis	Dr. Suresh C. H.	06.05.2024
	10CC19A39015	Dr. Neethi Raveendran	Thiophene-based organic thermoelectric materials: Exploring molecular design, doping techniques and nanocomposite formations	Dr. Vijayakumar C.	08.05.2024

	10BB17A39022	Dr. Drissya T.	Exploration of selected Streptomyces strains from the Western Ghats for its agriculture and biomedical application	Dr. Muthu Arumugam / Dr. Dileep Kumar B. S.	09.05.2024
	10BB18A39030	Dr. Alisha Valsan	Exploring the anticancer potential of bisbenzylisoquinoline alkaloid-phaeanthine and its targeted delivery through a nanocarrier system	Dr. Radhakrishnan K. V. / Dr. Nisha P.	20.05.2024
	10CC18A39012	Dr. Bhavya A S	2D- Hexagonal boron nitride heterostructures based triboelectric nanogenerator for mechanical energy harvesting and tactile sensing applications	Dr. Surendran K. P.	21.05.2024
	10PP19A39039	Dr. Haritha M	Molecular electrostatic potential analysis of rings in Drugs and Drug- like molecules: Predictions on lipophilicity and hydrogen bond propensity	Dr. Suresh C. H.	31.05.2024
	20EE18J39009	Dr. Hari S	Experimental and simulation studies of squeeze cast Al-Si-Cu-Mg- Ni alloy for piston applications of high power engines	Dr. Ravi M. / Dr. Savithri S.	07.06.2024
	10CC16A39007	Dr. Valmiki Praveen Kumar	Improved synthetic transformations to access indole and naphthol appended conjugates	Dr. Sasidhar B. S. / Dr. Priya S.	25.06.2024
	10PP19A39027	Dr. Chinnu V Devan	Investigation on thermoelectric and magnetic properties of transition metal based chalcogenides	Dr. Biswapriya Deb / Dr. Manoj Raama Varma	15.07.2024
	10PP18A39024	Dr. Adarsh S. Pillai	One Dimensional Nanomaterials in Functional Inks for Screen Printed Flexible and Wearable Devices	Dr. Surendran K. P.	22.07.2024
	10BB19J39002	Dr. Sreejith R. P.	FTIR-based chemometric investigations on lignocellulosic biomass for potential biorefinery applications	Dr. Savithri S. / Dr. Rajeev K. Sukumaran	08.08.2024
	10BB17A39025	Dr. Rahul R Menon	A study on native brackish rice-associated Flavobacterium spp.: first insights into their ecology, plant functions, eco-physiology, taxonomy, and genomes	Dr. Ramesh Kumar N.	09.08.2024
	10PP17A39030	Dr. Anjali K Sajeev	Studies on hybrid light emitting diodes using cesium copper iodide: Device engineering aspects	Dr. Narayanan Unni K. N.	21.08.2024
	10PP17A39032	Dr. Anooja J	Photoanode engineering of dye-sensitized photovoltaic cells using zinc oxide microstructures for efficient light harvesting applications	Dr. Suraj Soman / Dr. Narayanan Unni K. N.	30.08.2024
	10CC19A39001	Dr. Kavya Mohan	Pectin based soft-materials: Comprehensive characterization of physicochemical, structural, textural and rheological attributes for food application	Dr. Nisha P. / Dr. Jayamurthy P.	08.10.2024

	10PP19J39002	Dr. Thejas K. K.	Non-rare earth-based new class of inorganic phosphors for lighting, medical imaging and security applications	Dr. Subrata Das	14.10.2024
	10CC16A39006	Dr. Tessy T. D	Synthesis and ultrafast excited state relaxation dynamics of oxadiazole and diketopyrrolopyrrole derivatives for optoelectronic applications	Dr. Karunakaran Venugopal	18.10.2024
	10BB20J39019	Dr. Induja D. K.	Investigation of diverse secondary metabolites through axenic and co-cultures of selected <i>Streptomyces</i> strains from the Western Ghats Forest	Dr. Ravi Shankar L/ Dr. Reshma M V	29.10.2024
	10PP19A39037	Dr. Vibhu Darshan	Functional Organic Field-Effect Transistors: Role of Semiconductor Morphology and Charge Trapping	Dr. Narayanan Unni K. N.	08.11.2024
	10CC18A3020	Dr. Sruthi Suresh	Fabrication of Poly (Vinylidene Fluoride)-based Polymer Aerogels: Structure, Properties and Applications	Dr. Bhoje Gowd E.	11.11.2024
	10CC18A39019	Dr. Shisina S.	Structurally modified vanadate phosphors designed for solid-state lighting and pigment applications	Dr. Subrata Das	14.11.2024
	10CC18A39013	Dr. Ranjana Venugopal	Enhancing the functional capabilities of tungsten oxide-derived electrochromic devices	Dr. Biswapriya Deb	09.12.2024
	10CC18A39004	Dr. Madhukrishnan M.	Design, synthesis and biological assessment of SERS guided cell surface glycan modifications and anti-calcification properties of nano-rhein	Dr. Kaustabh Kumar Maiti	10.12.2024
	10CC21J39004	Dr. Rothish R Nair	Development of functionalized clay based modular sorbent systems for remediation of selected oxy-anionic contaminants from water resources	Dr. Prathish K. P.	12.12.2024
	10CC18J39003	Dr. Krishnakumar K. A.	Development of novel synthetic strategies for iminosugar-based glycomimetics	Dr. Ravi Shankar L.	13.12.2024
	10BB17A39024	Dr. Roopasree O J	Molecular characterization of the functional C2 domain in CC2D2A associated with ciliopathy	Dr. Jayamurthy P/ Dr. Shobi Veleri	18.12.2024
	10BB18A39036	Dr. Raveena Natakkakath Kaliyathan	Value addition of unripe 'NenDr.an' banana (<i>Musa</i> (AAB) cv. NenDr.an) and exploration of its phytoconstituents	Dr. Reshma M V	21.01.2025
	10BB18A39033	Dr. Nair Anaga Madan-mohan	Trapping glycation intermediates for the modulation of diabetes and its complications: A natural product derived therapeutic approach	Dr. Jayamurthy P.	23.01.2025

	10BB19J39006	Dr. Anusha	Insights into mechanism of action of ginger rhizome-derived exosome-like nanoparticles against triple-negative breast cancer cells	Dr. Priya S.	30.01.2025
	10PP18A39025	Dr. Kavya Rajeev	Exciplex OLEDs: Strategies for White Emission and Multifunctional Devices	Dr. Narayanan Unni K. N.	03.02.2025
	10CC18A39001	Dr. Sruthi M M	Structurally engineered copper (II/I) electrolyte based dye-sensitized solar cells for indoor photovoltaics	Dr. Suraj Soman	10.02.2025
	10CC18J39004	Dr. Nishna N.	Design and development of iridium based dinuclear complexes for photodynamic therapy and optoelectronic applications	Dr. Joshy Joseph	17.02.2025
	10PP21A39005	Dr. Malini Abraham	Rationally designed innovative rare earth free red emitting nanophosphors for intelligent lighting, thermometry, and X-ray scintillation applications	Dr. Subrata Das / Dr. Sushanta Kumar Sahoo	19.02.2025
	10BB16A39010	Dr. Sunithakumari V. S.	A study on the microbiome of brackish-associated native rice varieties of Southern India: New insights into their genomes, plant-associated lifestyle, and brackish adaptation	Dr. Ramesh Kumar N.	25.02.2025
	10BB17J39007	Dr. Gopika V. Krishnan	Endophytic bacteria and their bioactive metabolites for enhanced crop productivity and induction of systemic resistance in rice plant against sheath blight disease	Dr. Krishnakumar B. / Dr. Dileep Kumar B. S.	27.02.2025
	10BB19A39045	Dr. Muhammed Jasim	Comprehensive Evaluation of <i>Cassia mimosoides</i> L. for Antidiabetic Efficacy: Bioactive Compound Identification, Formulation Design and Pharmacological Studies	Dr. Kumaran A. / Dr. Jayamurthy P.	03.03.2025
	10CC19A39014	Dr. Meera Sebastian	Studies on metal oxide-based catalysts for ammonia electrosynthesis from nitrogen	Dr. Nishanth K. G. / Subrata Das	20.03.2025
	10BB18A39035	Dr. Reshma M Mathew	Alpha-transglucosidase from <i>Aspergillus carbonarius</i> BTCF-5: Cloning, molecular characterization and application in the synthesis of stable vitamin C analogue	Dr. Rajeev K. Sukumaran	26.03.2025
	10BB18A39034	Dr. Shini V S	Resistant starch encapsulated Lactoferrin for the effective management of inflammation	Dr. Nisha P.	27.03.2025

Jigyasa Programs in a Nutshell

SL No	Name of the Programme	No. of Programs conducted	No. of Schools/ Colleges/ other Institutions Benefitted	Total Students Benefitted	Total Teachers Benefitted
1.	Institutional Visit to CSIR-NIIST for School/College Students	17	20	833	60
2.	Scientist-Student Interaction / Outreach Programmes/ Scientists visit schools to deliver popular science lectures.	13	45	1311	90
3.	Teacher Transformation Training Programme and Faculty Development Programmes	2	2	-	68
4.	Open Day Celebrations (National Science Day, National Technology Day, CSIR Foundation Day)	3	48	1505	130
5.	A summer program for school children to have a hands-on experience in scientific research.	2	1	25	5
6.	Hands-on Training Workshop for PG Students and Research Scholars.	3	-	114	-
7.	Other Jigyasa Programmes	5	~303	2278	285
Total		44	419	6066	638

List of Major Jigyasa Activities

Sl. No	Name of the Program	Duration	No. of Teachers	No. of Students
	National Technology Day Celebration and MoU Exchange with NIT, Calicut on 13 th May 2024	1	16	134
	Two-phase Summer Programme for Chinmaya Vidyalaya, Naruvamood, Trivandrum on 29 and 30 April 2024 and 14 th and 15 th May 2024	2	5	25
	KVS-JIGYASA Future Innovators Program 2024- Popular Science Lectures, Scientist-student interactions, Science quiz and games, and Visit to R&D Facilities on 28 June 2024.	1	14	210
	A series of Plastic Awareness programs & Scientist Interaction Program	4	18	285
	An Open Day was conducted as a part of CSIR-NIIST Foundation Day on October 7, 2024.			
	CSIR -NIIST and KAMP One-day Scientist-Student Interaction Program	1	7	24
	CSIR-NIIST Jigyasa- NVS inaugural program and Science Outreach Program on 8 November 2024	1	18	213

	IISF Curtain Raiser and Science Outreach Program 2024 on 5 November 2024	1	9	164
	and IISF-SSTV 2024 at IIT, Guwahati from November 30 to December 3	4	281	2167
	Bala Sastra Congress 2024-25 (LENS) on 2 nd and 3 rd January 2025 at CSIR-NIIST	2	-	98
	National Science Day Celebrations at CSIR-NIIST on 28 February 2025	1	35	465

Other Major Jigyasa Activities

1	Kumari Arivial Peravai Young scientist programme 2023 - 2024	3 rd May 2024
2	Two-phase summer programme for Chinmaya Vidalaya, Naruvamood	On 29 & 30 April and 14 & 15 May 2024
3	Institutional visit from PMS Dental College & Research, Trivandrum	29 th May 2024
4	R&D visit by teachers from Kendriya Vidyalaya Sangathan (KVS)	14 th June 2024
5	Institutional visit from Manipur University	18 th June 2024
6	R&D visit by the participants of 'One Week One Theme' Program- sustainable energy technologies for agrivoltaics and building sectors- energy & energy devices	26 June 2024
7	KVS-Jigyasa Future Innovators Program 2024	28 June 2024
8	Scientist-student interaction & institutional visit for University of Kerala	5 July 2024
9	Scientist-student interaction & institutional visit for SH College, Thevara, Ernakulam	5 July 2024
10	Institutional visit from Sreedevi Devi Kumari Women's College, Kuzhithurai, and College of Agriculture Vellayani	12 July 2024
11	Visit to R&D facilities for participants of the national thematic conclave on speciality chemicals and sustainable packaging based on the theme chemicals (incl. Leather) and petrochemicals	19 July 2024
12	Scientist-student interaction & single-use plastics awareness programme	8 August 2024
13	Scientist-student interaction & single-use plastics awareness Program	14 August 2024
14	Scientist-student interaction & single-use plastics awareness Program	16 August 2024
15	Awareness Program on health risks and environmental impact of plastic food packaging wraps at Govt. GHSS Malayinkeezhu, Thiruvananthapuram	27 August 2024
16	Scientist-student interaction program & r&d facility visit from VSSC Central School, Thiruvananthapuram	6 September 2024

17	Scientist-student interaction- science exposure program Visit to R&D facilities & science quiz	20 September 2024
18	Institutional visit from Sir Syed College, Taliparamba, Kannur	27 September 2024
19	Scientist- student interaction and visit to R&D facilities by APJ Abdul Kalam Technological University, CET Campus, Trivandrum	22 October 2024
20	Institutional visit from St. Gregorios College, Kottarakkara	23 October 2024
21	Scientist-student interaction program in capstone projects	On 5 November 2024
22	IISF- India International Science Festival 2024- curtain raiser and Science Outreach Program @CSIR-NIIST	5th November, 2024
23	Institutional visit from St. Berchmans College, Changanassery	8 November 2024
24	CSIR-NIIST Jigyasa NVS-inaugural Program Science Outreach Program	On 8 November 2024
25	Institutional visit from Perumon College of Engineering, Kollam	13 December 2024
26	CSIR-Jigyasa scientific aptitude assessment program	20 December 2024
27	One-day practical workshop in the food engineering unit operations	30 December 2024
28	Bala Sastra Congress 2024-25 (lens)	2 & 3 January 2025
29	Institutional visit from NIFTEM, Thanjavur	21 January 2025
30	Institutional visits from Mar Athanasius College, Kothamangalam, WMO Imam Gazzali Arts & Science College, Koolivayal, Wayanad & the Oxford College of Science, Bangalore	23 January 2025
31	One-day career guidance workshop	30 January 2025
32	Science outreach program and institutional visit	31 January 2025
33	Institutional visit from St. Berchmans College, Changanassery	6 February 2025
34	Facility visit for participants of 1G 2G bioethanol & biofuel skill development program	13 February 2025
35	Science exposure program & scientist-student interaction program	14 February 2025
36	Institutional visit from Hindusthan College of Arts & Science, Coimbatore	14 March 2025
37	Scientist-student interaction & institutional visit from BRPT Dr. MGR Government Arts and Science College in Palacode, Tamil Nadu	14 March 2025
38	One-day NMR facility training for M. Sc. Project students and PhDs scholars	19 March 2025
39	One-day NMR facility training for M. Sc. Project students and PhDs scholars	26 March 2025
40	Institutional visit from MNCE Academy, Thiruvananthapuram	28 March 2025
41	Interstate exposure visit of farmers from the department of horticulture and plantation crops, Kanyakumari district	28 March 2025

Skill Training Program 2024-25

No.	Training Program
1	Food Processing and Analytical Techniques
2	IPR Patent Filing and Drafting
3	Advances in Polymer Material Science
4	Structure Elucidation of Organic Molecules by NMR
5	Introduction to Life Cycle Assessment Studies on Bioprocessing and Chemical Engineering – Phase I
6	Sample Preparation and Extraction Studies for Nutraceutical Preparation
7	Synthetic Organic Chemistry – Hands on Training on Fundamentals and Specialized Reactions
8	Microalgal Lipidomics Scaleup and FAME Profile by GC-MS
9	Sanitation Capacity Building Program
10	Project Training and Internship Trainings
11	Remote Sensing and Geographic Information Systems in Environmental Impact Assessment and Management
12	Applications of Artificial Intelligence in Advanced Bioprocessing
13	Comprehensive Herbal Drug Development
14	Introduction to Life Cycle Assessment Studies on Bioprocessing and Chemical Engineering – Phase II
15	1G, 2G Ethanol and Biofuels – Process Development, Analysis, Opportunities and Pilot Scale Operation
16	Training on NMR Facility
17	Training on Transfat Free Food Applications

Agreements 2024-2025

Sl. No.	Title	Nature of the MoU	Name of the firm/firms with whom the MoU/ Agreement is entered into
1	Evaluating the functional properties of protein and starch products and suggest suitable food products through product development, including high moisture meat analog prototypes and assist in extraction of canola/rapeseed proteins	MoA	Relsus Pvt. Ltd., Singapore
2	Agreement for technology transfer for setting up of plant for manufacturing single-use biodegradable tableware from rice husk	Technology Transfer	Agriware Pvt. Ltd., Andhra Pradesh
3	Evaluation of sorbents for capturing CO ₂ from blast furnace top gas and stove waste gas	MoU	Tata Steel Ltd., Jamshedpur, Jharkhand
4	Processing of IR reflective black and green pigments for paints & coatings applications	NDA	Ultramarine & Pigments Ltd., Mumbai
5	A technological evaluation of the 2G Ethanol technology acquired from another company, in the Indian context, through a consultancy project	MoU	Thermax Ltd., Pune
6	Material (bacterial culture designated as Zymomonas mobilis R70B1) Hand over Agreement	MHA	Thermax Ltd., Pune
7	Confidential disclosure agreement regarding the evaluation of 2G Ethanol technology acquired from another company, in the Indian context	CDA	Thermax Ltd., Pune
8	NIT-C and CSIR-NIIST to collaborate in the field of Science & Technology and basic research, faculty and student exchange program for the mutual benefit by utilising the expertise and infrastructure existing in both institutions.	MoU	National Institute of Technology, Calicut
9	Agreement for technology transfer for manufacturing leather alternative (Vegan leather) from pseudo stem and pineapple leaves	Technology Transfer	Alter Wave Eco Innovations Pvt. Ltd., Ernakulam
10	Refurbishing, repurposing, recycling, refining and regeneration (5R) of Lithium-ion batteries	NDA	M/s Trishulavel Eshan Pvt. Ltd. (TEPL), Karnataka
11	Agreement for sponsored research on animal leather trimmed waste into high-quality leather-like material	MoU	M/s PA Footwear Pvt. Ltd., Chennai
12	Agreement for sponsored project for the development of two-component polyurethane adhesives	MoU	M/s Crown Tapes Pvt. Ltd., Mumbai

13	Setting up a manufacturing unit for the production of leather alternative (Vegan leather) from cactus	Technology Transfer	M/s Veganvista Corp Pvt. Ltd., Ahmedabad
14	Plant oil based bio-resin synthesis for paper coating	Technology Transfer	Mr. Sanchit Gulati, Incredible Roots, Haryana
15	Collaborative R&D on management of pathogenic medical waste	Agreement for Collaborative Research	AIIMS, New Delhi
16	Early detection of cancers from blood samples by Raman spectroscopy and artificial intelligence: Clinical validation of a cutting-edge diagnostic technique	MoU	Tata Elxsi Limited, Bangalore
17	A mutual framework governing the respective organizational relationships, responsibilities and activities between the parties while carrying out the research collaboration	MoU, Collaboration Agreement	Cancer Institute CIA, Adyar
18	Development of ultrasound assisted membrane bioreactor and aligned operational processes for sustainable enzyme reusable saccharification of cellulose-enriched waste biomass	MoA	DBT, New Delhi
19	Dye solar modules for enhanced indoor light harvesting as Airport facades: development, integration and deployment	Agreement	International Airport Ltd. (TIA), Thiruvananthapuram
20	Technology transfer for manufacturing leather alternative (Vegan leather) from Cactus	Technology Transfer	M/s Sunita Ecotex, Kolhapur
21	To carryout collaborative research studies , projects and testing for Suchitwa Mission and conduct training for officials of Suchitwa Mission, industries and other institutions covered under different acts and rules	MoU	Suchitwa mission, Thiruvananthapuram
22	Production of smart proteins from industrial byproducts of pulses, legumes and cereals	MoU	M/s Nutriome Biosolutions, Tamil Nadu
23	Collaborative framework for clinical validation of base IP	MoU	Olusium Technologies in Advanced Research Pvt. Ltd., Kanyakumari
24	Microstructure analysis of industrial yarns, and polymer chips	Agreement for Consultancy Project	M/s SRF Ltd., Chennai
25	Omega-3 fatty acid enriched edible algal biomass as feed supplements	MoU	DBT, New Delhi
26	Deed of Variation between CSIR-NIIST and M/s Galaxi Environ	Deed of Variation	Galaxi Environ, Ernakulam
27	Collaborative research projects in the areas of lightweight metallic materials and component testing	MoU	Tata Elxsi Ltd., Bangalore

28	Confidential Disclosure Agreement regarding microbial enzyme production	CDA	Biolaxi Enzymes Ltd., Mumbai
29	Material (Technical grade enzyme preparation from microorganisms, either in liquid or powder form, of 1) Beta glucosidase, 2) Phytase, 3) Cellulase, 4) Protease, and/or other enzymes as mutually agreed) Hand over and Confidentiality agreement	MHA	Biolaxi Enzymes Ltd., Mumbai
30	Technology Transfer for manufacturing leather alternative (Vegan leather) from vetiver and napier grass	Technology Transfer	M/s Srivan Estates LLP, Nagpur
31	Technology Transfer for manufacturing leather alternative (Vegan leather) from wheat and rice waste	Technology Transfer	Greensapio Tech Pvt. Ltd., Haryana
32	To explore and engage in exchange of Confidential Information in relation to "Eco-friendly filters" as agreed between CSIR-NIIST and Aerofil Filters.	NDA	Aerofil Filters India Pvt. Ltd., Kollam
33	Development of a technology for indigenous fibres based yarn for textile and sanitary wear application	Agreement for Sponsored Project	East Corridor Consultants India Pvt. Ltd., Lucknow
34	Setting up a manufacturing unit for the production of leather alternative (Vegan leather) from ground nut shell and corn husk	Technology Transfer	Leafy Leather Private Limited, Gujarat
35	Feasibility studies for the implementation of a wastewater treatment plant at 1. Ayurvedic Hospital Idukki, 2. Taluk Hospital Katappana, 3. KILA Academy, Kottarakkara	Agreement for Consultancy Projects	Kerala Rural Water Supply and Sanitation Agency(KRWSA)
36	MoU for mutual research and academic collaboration	MoU	Karunya Institute of Technology (KITS), Coimbatore
37	Development of ultra low thermal conducting LaPo ₄ -La ₂ Zr ₂ O ₇ (LP-LZ) ceramic composite tiles	Agreement	VSSC, Thiruvananthapuram
38	Agreement for sponsored research on project 'Development of hard composites from leather industry scoring dust'	Agreement for Sponsored Projects	PA Footwear Pvt. Ltd., Chennai
39	Collaborative research in the area of "Sensory perception of food systems using functional magnetic resonance imaging"	MoU	Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST), Thiruvananthapuram
40	MoU for the Transfer of Technology: Biomedical waste conversion rig and recyclable biomedical waste rig	MoU	Bio Vastum Solutions Pvt. Ltd., Ernakulam
41	PARK to undertake scientific and technical research and testing activities to support innovators and entrepreneurs recommended by SCITECH PARK.	MoU	Science and Technology Park University of Pune

42	Agreement for Technology Transfer of manufacturing single-use biodegradable tableware from rice husk	Technology Transfer	Eclosure Pulp molding Technologies Ltd, Noida (UP)
43	Agreement for Technology transfer for manufacturing leather alternative (Vegan leather) from paddy straw	Technology Transfer	Vivartan Bio Leathers Pvt. Ltd., Haryana
44	Technology transfer for onsite treatment of organic waste water and resource recovery (NOWA)	Technology Transfer	E-Nadu Yuvajana Co-Operative Society, Kottayam
45	Technology transfer for onsite treatment of organic waste water and resource recovery (NOWA)	Technology Transfer	Foab Solutions Pvt. Ltd., Changanacherry
46	Setting up of plant for manufacturing single-use biodegradable tableware from peanut shell	Technology Transfer	ELIKA Suhrd Cutlery LLP, Gujrat
47	Agreement for sponsored research on nonogenerators integrated smart tyre for kinetic energy harvesting and self powered tyre condition monitoring applications	MoU	MRF Ltd., Chennai
48	MoU for technology transfer for manufacturing leather alternative (Vegan Leather) from Paddy straw	Technology Transfer	Dias Craft Pvt. Ltd., Gujrat
49	MoU for the environmental impact assessment study for capital dredging of beypore port and disposal of dredged material	MoU	Kerala Maritime Board (KMB), Thiruvananthapuram
50	Technology licensing of JAIVAM- bacterial consortium for accelerating aerobic composting	Technology Transfer	Agso Agrosoldier Pvt. Ltd.
51	Agreement for licensing of intellectual property on non-exclusive basis in respect of plant and machinery for large-scale production of biodegradable plates and cutlery	IP Sharing	Devaki Engineering Enterprise Pvt. Ltd.
52	Amendment to Memorandum of Understanding dated 01/07/2024	Amendment/ Deed of Variation	Tata Elxsi Ltd., Bangalore
53	Extraction of rare earth metals from spent automotive catalysts and motor magnets	Agreement	Greenscape Eco Management Pvt. Ltd., New Delhi
54	Know-how for manufacturing single-use biodegradable tableware from rice husk	Technology Transfer	Thinaipporul Wares Pvt. Ltd.
55	Technology licensing of JAIVAM- bacterial consortium for accelerating aerobic composting	Technology Transfer	Agro Bio Tech Research Centre Ltd., Kottayam
56	Know-how for onsite treatment of organic wastewater and resource recovery	Technology Transfer	Memfill Tech Pvt. Ltd., Karaikudi, Tamil Nadu
57	A system and a method for onsite wastewater treatment and resource recovery (NOWA)	Technology Transfer	Purifying Systems and Technics, Ernakulam
58	To establish a mutual framework governing the respective organisational relationships, responsibilities, and activities between the institutions while carrying out the research collaboration	MoU	Indian Institute of Space Science and Technology (IIST), Thiruvananthapuram

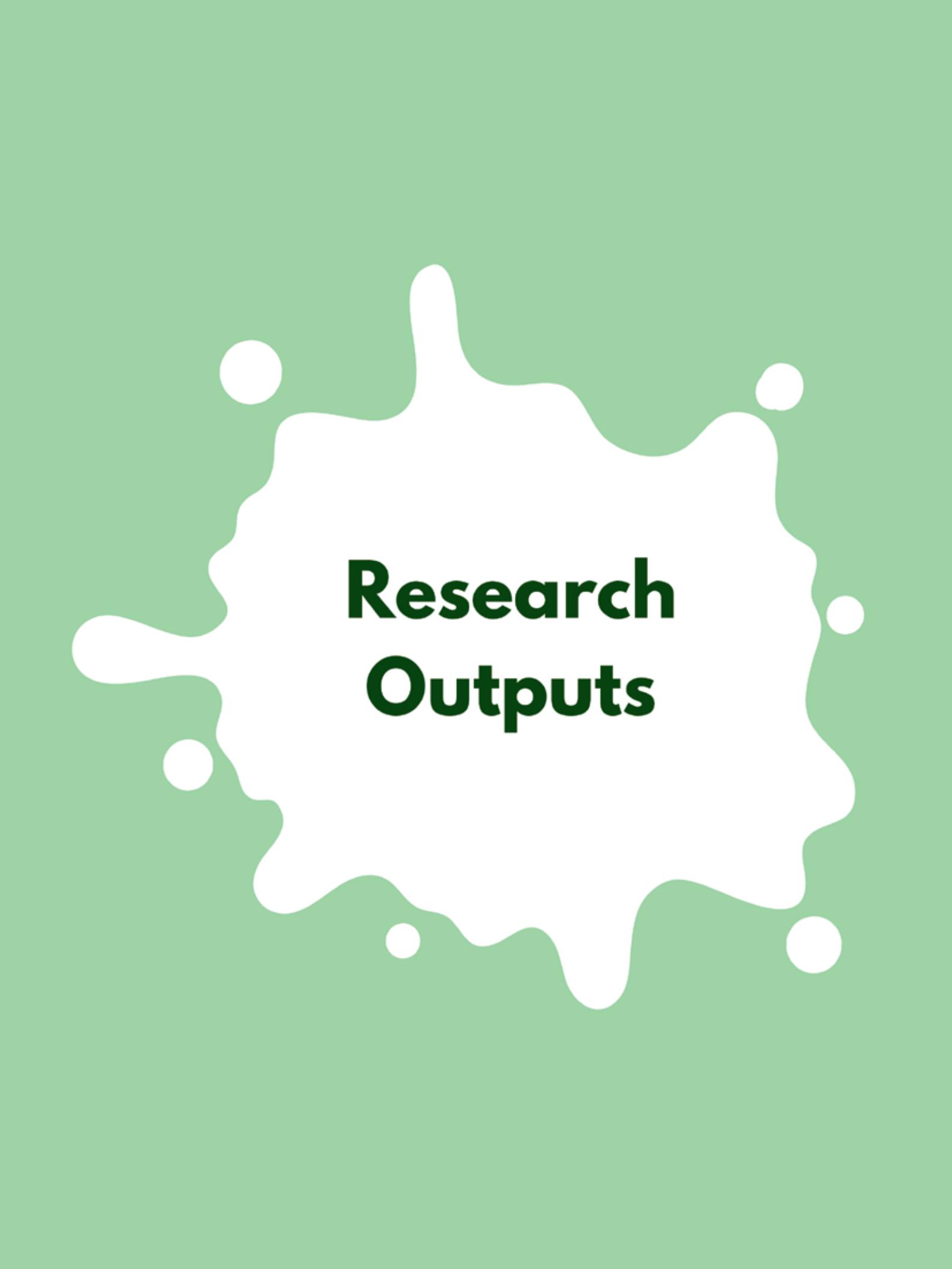
59	INSIGHT- Analysis of plant extracts	Agreement for Sponsored Research	Plant Lipids Pvt. Ltd., Cochin
60	SHIELD- Encapsulation of flavors and colors	Agreement for Sponsored Research	Plant Lipids Pvt. Ltd., Cochin
61	Process optimization for Vanillin production by isoeugenol biconversion from clove oil using semi- purified soy- lipoxygenase	Agreement for Sponsored Research	Plant Lipids Pvt. Ltd., Cochin
62	The CoEM-KSCSTE and CSIR-NIIST to collaborate in the field of cutting-edge microbiome research in the field of microbiome, Pre and Pro-biotics for the mutual benefit by utilising the expertise and infrastructure existing in both institutions	Agreement For Collaborative Research	Centre of Excellence in Microbiome (CoEM), under KSCSTE
63	Confidential information in relation to the design and fabrication of the dynamic gastrointestinal system	NDA	Antony David & Company, Thrissur
64	Extraction of mineral potash from rock-dust and subsequent utilization for making construction bricks	Agreement for Sponsored Research	NS & Co, Tiruchirappalli
65	Collaboration on research activities, technology incubation, diffusion and entrepreneurship development.	Agreement For Collaborative Research	Dalit Indian Chamber of Commerce and Industry (DICCI)
66	Collaboration on research activities, technology incubation, diffusion and entrepreneurship development.	Agreement For Collaborative Research	Chamber for Advancement of Small and Medium Businesses (CASMB)
67	Agreement on sponsored project titled, 'repurposing guar gum byproducts to sustainable products'	Agreement for Sponsored Research	Taiyo Kagaku India Pvt. Ltd.
68	Setting up of centres of excellence in the field of Chemicals and Petrochemicals	MoU	Department of Chemicals and Petro Chemicals (DCPC)
69	Agreement for sponsored project on manufacturing of innovative building materials from fine rock sand dust generated by Akashganga constructional machines Pvt Ltd, Maharashtra	Agreement for Sponsored Project	Akashganga Biosciences Pvt Ltd., Maharashtra
70	Agreement for collaborative research on IPR & related aspects	MoU	Coconut Development Board (CDB)
71	Agreement for technology transfer and subsequent turnkey implementation for setting up UP 6 TPD processing unit for Marayoor jaggery	MoU	Marayoor Hills Agricultural Development Society (MAHAD), Idukki
72	Agreement for technology transfer and subsequent turnkey implementation for setting up UP 6 TPD processing unit for Marayoor jaggery	MoU	Anchunadu Karimpu Ulpathana Vipanana Sangham

73	Technical inputs for the knowledge paper on transition from fossil-based feedstock for chemicals	MoU	CSIR-National Chemical Laboratory (NCL), CSIR-NIIST and Chase Avian Communications Private Limited
74	Agreement for technology transfer for manufacturing biodegradable tableware from rice husk	Technology Transfer	Royal Agro Industries, Andra Pradesh
75	Creation of a technology incubation facility for coconut processing and value addition	MoA	Coconut Development Board (CDB)
76	Development of a smart traceability system for the coconuts and coconut- based products of selected indigenous cultivars	MoA	Coconut Development Board (CDB)

Technology Transfers : 2024-2025

Sl. No.	Title	Name of the firm
1	Agreement for technology transfer for setting up of plant for manufacturing single-use biodegradable tableware from rice husk	Agriware Pvt. Ltd., Andra Pradesh
2	Agreement for technology transfer for manufacturing leather alternative (vegan leather) from pseudo stem and pineapple leaves	Alter Wave Eco Innovations Pvt. Ltd., Ernakulam
3	Setting up a manufacturing unit for the production of leather alternative (Vegan Leather) from cactus	Veganvista Corp. Pvt. Ltd.
4	Plant oil based bio-resin synthesis for paper coating	Mr. Sanchit Gulati, Incredible Roots, Haryana
5	Technology transfer for manufacturing leather alternative (Vegan Leather) from cactus	Sunita Ecotex, Kolhapur
6	Technology transfer for manufacturing leather alternative (Vegan Leather) from vetiver and napier grass	Srivan Estates LLP, Nagpur
7	Technology transfer for manufacturing leather alternative (Vegan Leather) from wheat and rice waste	Greensapio Tech Pvt. Ltd., Haryana
8	Agreement for technology transfer of manufacturing single-use biodegradable tableware from rice husk	Eclosure Pulp molding Technologies Ltd., Greater Noida (UP)
9	Setting up a manufacturing unit for the production of leather alternative (Vegan Leather) from ground nut shell and corn husk	Leafy Leather Pvt. Ltd., Surat, Gujarat
10	Agreement for technology transfer for manufacturing leather alternative (Vegan leather) from paddy straw	Vivartan Bio Leathers Pvt. Ltd., Bahadurgarh, Haryana
11	Technology transfer for onsite treatment of organic waste water and resource recovery (NOWA)	E-Nadu Yuvajana Co-Operative Society, Kottayam
12	Technology transfer for onsite treatment of organic waste water and resource recovery (NOWA)	Foab Solutions Pvt. Ltd., Changanacherry
13	Setting up of plant for manufacturing single-use biodegradable tableware from peanut shell	ELIKA Suhrd Cutlery LLP, Porbandar, Gujarat
14	Technology licensing of JAIVAM: Biomedium for accelerating aerobic composting	Agso Agrosoldier Pvt. Ltd., Alappuzha
15	Agreement for Technology Transfer for Manufacturing Leather Alternative (Vegan Leather) from Paddy Straw	Dias Craft Pvt Ltd, Surat-394230, Gujarat

16	Agreement for licensing of intellectual property on non-exclusive basis in respect of plant and machinery for large-scale production of biodegradable plates and cutlery	Devaki Engineering Enterprise Pvt. Ltd., Bangalore
17	Know-how for manufacturing single-use biodegradable tableware from rice husk	Thinaipporul wares Pvt. Ltd.,Tamilnadu
18	Technology licencing of JAIVAM: Biomedium for accelerating aerobic composting	Agro Bio Tech Research Centre Ltd., Kottayam
19	Know-how for onsite treatment of organic waste water and resource recovery (NOWA)	Memfill Tech Pvt. Ltd., Karaikudi, Tamil Nadu
20	A system and a method for onsite wastewater treatment and resource recovery (NOWA)	Purifying Systems and Technics, Ernakulam
21	Agreement for technology transfer for manufacturing biodegradable tableware from rice husk	Royal Agro Industries, Andra Pradesh



Research Outputs

LIST OF PUBLICATIONS - 2024

TOTAL PUBLICATIONS: 295

SCI Journals: 213

Non-SCI Journals: 31

Book Chapters: 51

Avg. Impact Factor: 5.381

1. Abdul Hakkeem, H. M., V.s., A., De, A., Babu, A., M., P., & Pillai, S. (2024). Nanocellulose-based cobalt(II) coordinated malonic acid hybrid aerogels exhibiting reversible thermochromism and moisture sensor properties. *International Journal of Biological Macromolecules*, 273, 133140. <https://doi.org/10.1016/j.ijbiomac.2024.133140>
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3. Abhilash, T. K., Hakkeem, H. M. A., Anas, S., Pillai, S., & Chandran, A. (2024). Highly luminescent, fast switching electro-optical device based on core–shell bimetallic nanoparticles/ferroelectric liquid crystal composites. *Nanotechnology*, 35(38), 385201. <https://doi.org/10.1088/1361-6528/ad5a7a>
4. Abhirami, B. L., Aswathy Krishna, A., Muhammed Jasim, A. R., & Kumaran, A. (2024). Acacia leucophloea (Roxb.) Willd.: Multi-targeted therapeutic efficacy against type 2 diabetes mellitus. *European Journal of Integrative Medicine*, 66, 102344. <https://doi.org/10.1016/j.eujim.2024.102344>
5. Abhirami, B. L., Krishna, A. A., Bashi, M. B., Abhijith, B. S., Varghese, A. W., & Kumaran, A. (2024). Isolation of Potent 5 α -Reductase Inhibitors and Antioxidants from Sphaeranthus indicus Linn. For the Management of Benign Prostatic Hyperplasia. *Plant Foods for Human Nutrition*, 79(4), 932–938. <https://doi.org/10.1007/s11130-024-01226-2>
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7. Abraham, M., Dhanuka, J., Som, S., Pandey, M. K., & Das, S. (2024). A highly efficient deep red-emitting Mn⁴⁺-powered oxyfluoride nanophosphor developed for plant growth and optical thermometric applications. *Nanoscale*, 16(22), 10690–10705. <https://doi.org/10.1039/D4NR00787E>
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Contract Research Projects 2024-25

SL No	PROJECT TITLE	CLIENT	PROJECT LEADER
AGRO & FOOD PROCESSING TECHNOLOGY DIVISION			
1	Technological intervention for value addition of polyhedral spent materials ayurvedic industries	DST	Dr P Nisha
2	Exploration of exosomal and non- exosomal micron As from grapes against triple negative breast cancer	SERB	Dr S Priya
3	Development of spices based nebulizer formulation for prophylaxis of respiratory distress	Spices Board	Dr Tripti Mishra
4	Technology development for production of high value medium-chain triglycerides oil from coconut oil	CDB	Dr K Vasanth Raghavan
5	Preclinical evaluation of the effects of coconut vinegar on gut health	CDB	Dr R Venkatesh
6	Millets as functional food for addressing obesity by manifesting gut-brain axis	DST	Dr P Nisha
7	Phototherapeutic approach for the management of Benign prostatic hyperplasia: A multifaceted target-specific inhibition of selective alpha -adrenergic receptor, 5-alpha-reductase and phosphodiesterase type 5	ICMR	Dr A Kumaran
8	An integrated target specific inhibition of Acetylcholinesterase, phosphodiesterase-5 and Amyloid-Beta aggregation for Alzheimer's disease through phototherapeutic approach	ICMR-DHR	Mr Anand Ganapathy
9	Clinical validation of traditional millet recipes roti/dosa/ khichadi in maintaining healthy intestinal microbial flora and preventing lifestyle associated complications	DST	Dr S Priya
10	Integrated process for customized lipids and bioactive/protein/fibre rich products from by-products	DST	Mrs Heeba
11	Pilot scale production of bio resin coated mycelium-based biodegradable packaging materials from agri biomass to replace polystyrene (Thermocol sheet)	DST	Dr Anjineyulu Kothakota

BIOSCIENCES & BIOENGINEERING DIVISION

1	Diagnostic evaluation of a SERS-Nanoprobe based immunesensor for early detection of Alzheimer's disease biomarkers from blood	ICMR	Dr K K Maiti
2	Biotechnological approaches promising grains and food free of Fusarium mycotoxins	DST	Dr Madhavan Nampoothiri
3	Assembly of synthetic cell in a microfluidic system with tunable membrane potential	DST	Dr Harsha Bajaj
4	Building artificial cells with genetic information for regulated communication	DST	Dr Harsha Bajaj
5	Omega-3- fatty acid enriched edible algal biomass as feed supplements	DBT	Dr Muthu Arumugham
6	Bio refinery approach in recovering high value products from vegetable and fruit wastes under circular economy frame	DST Indo Italy	Dr P Binod
7	Bioactive pectin oligosaccharides production from fruit wastes using onsite-developed endogenous enzyme system - A Tailor-made green process to improve the functionality of prebiotics	SERB	Dr Pinaki Dey
8	Development of antimicrobials targeting bacterial cellular membrane to Combat multi-drug Resistance	ICMR	Dr Harsha Bajaj
9	Establishment of decentralized non- centrifugal sugars production unit for Marayoor Junction	DST	Mr T Venkatesh
10	Development of ultra sound assisted membrane bioreactor and aligned operational processes for sustainable enzyme reusable saccharification of cellulose- enriched waste biomass	DBT	Dr Pinaki Dey
11	Identification of novel genetic determinants of Pokkalibacter plantistimulans colonization and their functional role in pokkali rice symbiosis under natural brackish conditions	SERB	Dr N Rameshkumar
12	Development of a sandwich model magnetic capture system for the detection of pancreatic cancer biomarkers in serum by SERS based immune assay	DHR	Dr Vishnu Priya Murali
13	1G,2G Ethanol & Biofuels- Process development analyses. Opportunities, and pilot scale operation	Ministry of MSME	Mr T Venkatesh

14	Development of spectro-cytology screening technology for detection of grades of cervical cancer lesions by Surface Enhanced Raman Scattering(SERS) and artificial intelligence	ICMR	Dr K K Maiti
15	Intrinsic subtyping using high throughput gene expression profiling and surface enhanced Raman Spectroscopy (SERS) based approach to predict pathological complete response in Triple Negative Breast Cancer patients (TNBC)	ICMR	Dr K K Maiti

CHEMICAL SCIENCE & TECHNOLOGY DIVISION

1	Experimental and theoretical investigation on lead free perovskites for opto electronic applications	SERB	Dr C Vijayakumar
2	Synthesis and photo physical study of hybrid perovskite materials for high efficiency electronic and optoelectronic devices	KSCSTE	Dr C Vijayakumar
3	Base controlled diversity synthesis of spiro-indolinone hybrids of medicinal relevance	SERB	Dr B S Sasidhar
4	Investigation of ultrafast dynamics of chromophores exhibiting thermally activated delayed fluorescence for OLEDs	BRNS	Dr Karunakaran Venugopal
5	Exploring Lead free hybrid perovskite materials for neuromorphic computing	DST	Dr C Vijayakumar
6	Illustration of excited state symmetric breaking in the multiple electron donor-acceptor materials using ultrafast time- resolved infrared Spectroscopy	SERB	Dr Karunakaran Venugopal
7	Stable, dopant-free and cost-effective hole transporting materials for Perovskite solar cells: probing interfacial charge transfer dynamics in n-i-p & p-i-n	SERB	Dr Joshy Joseph
8	Synthesis of polyhydroxylated pyrrolidine iminocyclitol-based novel antivirals against Dengue Virus (File No. VIR/17/2020/ECD-I)	ICMR	Dr L Ravishankar
9	Isolation and exploration of phytochemicals against obesity and related complications	KSCSTE	Dr B S Sasidhar
10	Revealing ultrafast charge transfer dynamics controlling the efficiency of photo functional materials: A combination of femtosecond pump probe and time- resolved electron paramagnetic resonance spectroscopies	DST Indo German	Dr Karunakaran Venugopal
11	Multi resonance & horizontally-oriented blue TADF emitters from materials to device engineering	DST Indo German	Dr Ishitha Neogi

12	Design and Development of Functional Heteroacenes and Heteroacene Incorporated Dyes for Indoor/Ambient Light Harvesting Applications	SERB	Dr Jubi John
13	Design, Synthesis of Novel Naphthalene-Bipyridine appended Iridium (Nap-Ir) Photosensitizer for Targeted Nanoparticle Based Phototherapy in Breast Cancer Model	SERB	Dr K V Radhakrishnan
14	Phytochemical, metabolic, anti-ageing, and immunomodulatory properties of rasayana	KUHS	Dr K V Radhakrishnan

CENTRE FOR SUSTAINABLE ENERGY TECHNOLOGIES

1	Towards cost-effective fabrication of white OLEDs for solid-state lighting: How to address process complexity and optimal usage of materials	SERB	Dr K N Narayanan Unni
2	Digitally connected tribal colonies	Medical Electronics & Health Informatics Division	Dr K N Narayanan Unni
3	Organic- inorganic hybrid nanomaterials for non-conventional energy technologies	Nano Mission, DST	Dr K N Narayanan Unni
4	Tuning electrochemical pathways in new- generation electrochromic materials for secondary energy-sourcing	SERB	Dr Biswapiya Deb
5	Non precious metal oxide carbon hybrid electro catalyst for oxygen reduction reaction	SERB	Dr K G Nishanth
6	Automation and AI/ML assisted development of solid state battery technology (WP:NMC cathode for Li-ion batteries)	DST	Dr Rakhi R B
7	IC-MAP Collaborative research for accelerated development of materials and devices for energy harvesting and conservation technologies (CRADMET)-Energy Efficient Buildings (EEB)	DST	Dr P Sreejith Shankar
8	IC-MAP Collaborative research for accelerated development of materials and devices for energy harvesting and conservation technologies (CRADMET)-ADAAAPT- Accelerated Development via Automation and AI of Perovskite Solar cell Technology	DST	Dr Suraj Soman
9	Design and development of optics integrated rooftop agrivoltaics	ANERT	Dr Adersh Asok
10	Solar hybrid indoor light harvesters for self-powered IoT applications	DST	Dr Suraj Soman
11	Hybrid electrochromic materials and devices for multifunctional smart applications	KSCSTE	Dr P Sreejith Shankar
12	Printable Carbon Electrodes Replacing Gold: A Concept to Accelerate Development of Cost effective and Scalable Perovskite Solar Cells for Outdoor/Indoor Photovoltaic Applications	KSCTE	Dr Suraj Soman

MATERIALS SCIENCE & TECHNOLOGY DIVISION

1	Development of LTCC tapes and compatible gold pastes for space application	ISRO	Dr K P Surendran
2	Synthesis and development of multifunctional benzoxazines from agro residues and its polymer composites as high performance materials	DBT	Dr K I Suresh
3	Copper coating on poxy carbon composite for radio frequency reflector antennas	ISRO	Dr T P D Rajan
4	Indigenization of printable conductive gold technologies for electronic applications	DST	Dr K P Surendran
5	Advanced near net shape manufacturing technology of aluminium alloy and composite components for thermal management applications	DST	Dr T P D Rajan
6	Low-cost conductive inks for affordable RFID Applications	SERB	Dr K P Surendran
7	synthesis and development of hybrid carbon nanocomposites and polymer emulsions as flocculants for mining industry	Ministry of Mines	Dr K I Suresh
8	Novel material manufacturing method for large volume cast metal matrix nanocomposites (Ultra-Cast)	Ministry of Mines	Dr T P D Rajan
9	Moisture resistant, food compatible bio-resin coated paper for food packaging with repulpable potential	BIRAC	Dr Sushanta Kumar Sahoo
10	Development of molten regolith electrolysis process for oxygen production from simulated lunar soil	ISRO	Mr J Venkatesan
11	Development of self-healing refractory and investigation on the mechanism	ISRO	Dr Jayasankar
12	Development of environmentally benign inhibitor intercalated 2D mica nanosheet pigments for metal protective hydrophobic coating	DST	Ms Nithya
13	Development of smart multi-functional nanoceria incorporated hydroxyapatite/strontium phosphate composite coating on anodized Mg alloy for temporary implant applications	DST	Dr Simi
14	Highly flexible, self-responsive and bio based polymeric hydrogel composite films with energy efficient NIR shielding property	SERB	Dr Sushanta Kumar Sahoo
15	Technology for rare earth added aluminium alloys and products for aerospace, marine , energy and automotive applications	IREL, Mumbai	Dr T P D Rajan

16	Aluminium-Magnesium based bimetal castings for light weighting applications through centrifugal casting technique	DST -AMT	Dr A Srinivasan
17	Processing of cerium sulphide red pigment from ferrous carbonate precursor produced by IREL	IREL, Kollam	Dr S Ananthakumar
18	Spray pyrolysis based bench scale synthesis of morphologically tuned porous electrode materials for energy applications	DST	Dr U S Hareesh
19	A Sustainable approach for oleo chemicals production from agro and industrial residues using non-conventional oleaginous yeast and fungi	SERB	Dr P A Balakumaran
20	Pilot Plant extraction of rare earth elements (Scandium, Neodymium & Europium) from KMML Titanium industrial waste	Ministry of Mines	Dr M Sundararajan
21	Development of composition tolerant reusable aluminium alloys by recycling metallic waste	SERB	Dr Prijat Pallab Jana
22	High Entropy Mechanical Energy Scavenging through Piezo-Tribo-Hybrid Nano generators derived from Waste Materials aiding Circular Economy for Self-Powered Electronics	SERB	Dr Achu Chandran
23	In-vitro and in-vivo evaluation of biodegradable magnesium alloys for temporary implant applications	SERB	Dr A Srinivasan
24	Poly-gama-glutamic-acid and its blends as biodegradable material and an alternative to single use plastics	DBT	Dr P A Balakumaran
25	Extraction of gallium from titanium and iron ore industrial waste	Ministry of Mines	Dr S Ananthakumar
26	Fabrication of super polished aluminium mandrels for X-ray optics substrate	ISRO	Dr Prijat Pallab Jana
27	Strong deep-red/ NIR emitting and biocompatible gallogermanate nanophosphors for economic bio imaging applications	SERB	Dr Subratadas
28	Energy harvesting from martain environment using triboelectronic effect for powering smart sensor	ISRO	Dr Achu Chandran
29	Development of Cost Effective and Eco-Friendly Process to Recycle and Rebuild the Cell Grade Lithium Iron Phosphate Material from Spent Li ion batteries	Central Power Research Institute (CPRI)	Dr K Jayasankar

ENVIRONMENTAL TECHNOLOGY DIVISION

1	Upgradation of Food testing laboratory (MoFPI-FTL)	Ministry of Food Processing Industries (MoFPI)	Dr K P Prathish
2	Pilot scale demonstration of a comprehensive approach to recover high value products from waste banana pseudo stem	DST	Dr B Krishnakumar
3	Implementation of a sustainable bioenergy based model effluent treatment plant desiccated coconut industries	DST	Er Dhani Babu T
4	Review and update of National Implementation Plans (NIPs) under the Stockholm convention (SC) on persistent organic pollutant (POPs) for India	GEF-UNEP	Dr K P Prathish
5	Brahmapuram Fire Incident 2023: Hazardous chemical emission assessment and mitigation plans	KSPCB	Dr K P Prathish
6	Hydro dynamic cavitation assisted fractionation of coconut waste shell to MCC and its conversion to LGO	CDB	Er Dhani Babu T
7	Review update on biomedical waste management in Kerala State	KSPCB	Dr C Kesavachandran
8	Development of accelerated biodegradation (aerobic and anaerobic) testing method for biodegradable plastics	DBT	Dr Partha Kundu
9	Study on assessment of the air pollution load and emission in old and modern plywood manufacturing units in Kerala	KSPCB	Dr Partha Kundu
10	Chitan-glucan complex nanofibres from fungal mycelium and their implication of biomaterials through tuning of surface and mechanical properties	SERB	Dr K C Sherpa

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING UNIT

1	Adapting deep learning for prediction of Anaemic using multimodal data analysis	ICMR	Dr V Arunkumar
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CSIR Projects 2024-25

Sl No	Theme	Category	Project Title	Project Leader
1	CIE	FBR	Development of Biodegradable Prefabricated Vertical Drain by Molding Technique-A Sustainable Solution for Road Construction Over Soft Soil	Dr Saju Pillai
2	CIE	FBR	The development of photovoltaic / Thermal (PVIT) collector for the generation of electricity and hot water	Dr Adersh Ashok
3	Facility Creation	FCP	CSIR-NIIST Centre for AYUSH Quality, Testing and Innovation	Dr L Ravishankar/Er V V Venugopalan
4	4M	FIRST	Design and Development of Anisotropic Hybrid Aerogels with Preferred Orientation of Nano fillers for Electronic Applications	Dr E Bhoje Gowd
5	E30W	FIRST	Next Generation Building Integrated Urban Air Quality Management through novel Photo catalytic coatings: System Development and Efficiency Assessment	Dr K P Prathish
6	HTC	FIRST	Deciphering Bimolecular Condensate Interactions with Lipid Membranes as Target for New Drugs	Dr Harsha Bajaj
7	E30W	FTT	Sustainable Geocomposite drainage-root barrier systems for green highways	Dr Saju Pillai
8	Agriculture, Nutrition, Biotechnology	FTT	Effective utilization of agro residues for development of biomaterials based leather substitute - Process optimization and scale up studies	Dr Anjineyulu Kothakota
9	CLP	FTT	Greener and sustainable process to convert waste banana stem into nanocellulose	Dr Saju Pillai
10	CLP	FTT	Biobased polyurethanes and hybrid nanocomposite dispersions for application in leather finishing	Dr K I Suresh
11	Energy	FTT	Pre-commercialization feasibility studies and building integration of multifunctional dynamic window panels	Dr Biswapriya deb
12	Energy	FTT	Systems engineering of dynamic power window technology	Dr Adersh Asok
13	Energy	FTT	Indigenous development of processes and materials for highly efficient and stable perovskite solar cell technology	Dr K N Narayanan Unni

14	VVM	FTT	Development of Thermoresponsive materials as Vaccine Viral Monitors	Dr P Sreejith Shankar
15	E30W	FTT	Development & Demonstration of 10 TPD Clean Sustainable Municipal Solid Waste(MSW)	Dr Partha Kundu
16	EED	FTT	Scale-up and Field Trail for Spectral Converting Diverging Optics Integrated Even Light-Sharing Agrivoltaics Technology	Dr Adersh Ashok
17	EED	FTT	Dye Solar Modules for Enhanced Indoor Light Harvesting as Airport Facades: Development, Integration and Deployment	Dr Suraj Soman
18	CIE	FTT	High-performance Lead-free Piezoelectric Nanofibers Enabled Self-Powered Flexible Vibration Sensor for Real-time Health Monitoring of Structures and Machines	Dr Achu Chandran
19	4M	FTT	Near Net Shape Manufacturing Technology for Aluminum Alloy and Composite Components for Transport and Strategic Sectors	Dr T P D Rajan
20	E30W	FTT	Development and Demonstration of a High Spatio-temporal Resolution UAV-Aided GHG Monitoring System for Municipal Solid Waste Management	Mr Sravanth Tangella-mudi
21	E30W	FTT	Development and Demonstration of Biological (Biofilter) and Advanced Ozone-Based Technologies for Managing Obnoxious Odours for Community Applications	Er B Abdul Haleem
22	AEISS	FTT	Development of Al-Mg-Sc Alloy for Aerospace Application	Dr T P D Rajan
23	CLP	FTT	Sustainable Additives and Fillers for Biodegradable and Semicrystalline Polyesters	Dr E Bhoje Gowd
24	Energy	MMP	Hydrogen Technology (H2T)	Dr S V Shukla
25	Healthcare	MMP	Phenome India- CSIR Health Cohort Knowledgebase	Dr Rajeev K Sukumaran
26	COVID	MMP	Discovery & Pre-clinical development of antivirals for COVID_19 & other diseases	Dr Jubi John
27	CCUS	MMP	Carbondioxide capture and utilization from point sources of steel industry	Dr U S Hareesh

28	AgroMission	MMP	Innovative processes and technologies for crop protection chemicals	Dr L Ravishankar
29	Health care	MMP	Active Pharmaceutical ingredients for affordable health care (API-AHC)	Dr Jubi John
30	SHRI ANNA	MMP	Millet - Sustaining Health through Research and Innovation by Analysis of Nutrients and Nutraceuticals to Achieve global Awareness (SHRI ANNA)	Er V V Venugopalan
31	WTW	MMP	Sustainable Technologies for the safe utilization and recycling of non-metallic ilmenite mineral industrial wastes/Technology development for recovery of tantalum from secondary resources (RETAN)/Waste to wealth : Comprehensive solutions towards circular economy and sustainability	Dr S Ananthakumar/ Dr Jayasankar/ Dr Sreejith Sankar
32	Jigyasa	MMP	Jigyasa 2.0 Programme with the concept of Virtual lab Integrated (CJVL)	Dr Joshy Joseph
33	SPECHEM	MMP	Speciality chemicals for industrial applications	Dr Bhoje Gowd
			Hybrid Materials and Coatings for Multifunctional Superhydrophobic Applications.	Dr Sreejith Shankar
			Multifunctional printed smart leather for strategic application	Dr K P Surendran
			Scale-up of bio-resin formulation for multifunctional superhydrophobic self-cleaning coating for wood, plastics and wind rotor blade.	Dr Sushantha Kumar Sahoo
34	Industrial Enzymes	MMP	Fermentation Scale up and Technology Development of Lead Industrial Enzymes for Biofuel, Food, Feed, Agriculture and Vaccine Applications	Dr Madavan Nampoothiri/ Dr Rajeev Sukumaran
35	Phytopharma Mission	MMP	Phyto pharmaceutical mission, Phase III	Dr B S Sasidhar
36	Packaging	MMP	Sustainable Packaging Solutions for Net Zero Future	Dr C Anandharamakrishnan
37	Skill Development	NWP	CSIR integrated skill initiative Phase II	Dr V Moni
38	CLP	RDSF	Synthesis of cost effective potential fluorescent materials for security applications	Dr Praveen V K

39	ANB	RDSF	Separation and Purification of Clavulanic acid by membrane filtration and column chromatography	Dr Rakesh K Yasarla
40	AIML	RDSF	Deep Learning and chemometrics based approaches for synchronizing GC-MS and NIR spectra to identify adulteration in edible oil	Dr V Arun Kumar
41	E30W	RDSF	Development of odour measurement methods through dynamic olfactometry and setting up of odour emission standards in Indian scenario	Er Abdul Haleem B
42	E30W	RDSF	Investigation of VOC emission profiles from plywood industries: Modelling and Reduction strategies	Er.Sravanth Tangellamudi
43	E30W	RDSF	Development of NIIST Ecological Unit for Faecal Resource Treatment and Efficient Sludge Handling (NECO-FRESH)	Er Saurabh Sakhre
44	E30W	RDSF	Effective management of wastewater from houseboats to preserve wholesomeness of backwaters for long-term sustenance of tourism industry	Dr Akshay D Shende

Industry Projects 2024-25

Sl No.	Title	Organisation	Project Leader
Consultancy Projects			
1	Feasibility assessment of agro-residue for ethanol production using ICT's proprietary technology, using different biomass hydrolyzing enzyme cocktails	M/s. Institute of Chemical Technology, Mumbai (ICT, Mumbai)	Dr Rajeev K.Sukumaran
2	Catalyst (Process optimization for Vanillin production by isoeugenol biconversion from clove oil using semi-purified soy-lipoxygenase)	Plant Lipids Pvt Ltd, Cochin	Dr Rajeev K.Sukumaran
3	Characterization and commercial evaluation of dynamic fenestration products	Saint Gobain Research India (SGRI), Chennai	Dr Biswapiya Deb
4	INSIGHT - Fingerprinting of Shatavari Extracts	Plant Lipids Pvt Ltd, Cochin	Dr A Kumaran
5	Microstructure analysis of industrial yarns and polymer chips	SRF Ltd., Chennai	Dr E Bhoje Gowd

6	Geo-spatial mapping and inventory of E-waste in union territory of Lakshadweep and its island ecosystem	Lakshadweep Pollution Control Committee, Kavaratti	Er Saurabh Sakhre
7	Feasibility studies for the implementation of waste water treatment plant at 1. Ayurvedic Hospital Idukki, 2. Taluk Hospital Katappana, 3. KILA Academy, Kottarakkara	Kerala Rural Water Supply and Sanitation Agency (KRWSA)	Dr Akshay D Shende
8	Environmental Impact Assessment (EIA) studies of dredging and disposal at Beypore port, Kozhikode	Kerala Maritime Board, Thiruvananthapuram	Er Sravanth Tangellamudi
9	Preparation of annual compliance report for EC granted to "Multi-Product SEZ and CRZ clearance for desalination, sea water intake, outfall facility and pipeline"	Adani Ports and Special Economic Zone Limited	Er Sravanth Tangellamudi

Sponsored Projects

1	Evaluating the functional properties of plant proteins and starches for the potential product development including high moisture extrudates	M/s Relsus Pvt. Ltd, Singapore	Dr K Vasantha Ragavan
2	Development of an eco-friendly process for repurposing animal leather trimmed waste into high-quality leather- like material	M/s PA Footwear Pvt. Ltd., Chennai	Dr Anjineyulu Kothakota
3	Development of a Technology for Indigenous fibres based yarn for textile and sanitary wear application	East Corridor Consultants India Pvt. Ltd.	Dr Anjineyulu Kothakota
4	Repurposing guar gum by products for sustainable products : Developing biodegradable cutlery and leather	Taiyo Kagaku India Pvt. Ltd.	Dr Anjineyulu Kothakota
5	Technology for development of microencapsulation, retention and controlled release of flavour (lemon) and color (anthocyanin)	Plant Lipids Pvt Ltd, Cochin	Dr C Anandharamakrishnan
6	Processing of IR reflective black and green pigments for paints and coatings applications	M/s Ultramarine and Pigments Ltd., Mumbai	Dr S Ananthakumar
7	Development of two component polyurethane adhesives	M/s Crown Tapes Pvt. Ltd., Mumbai	Dr Sushanta Kumar Sahoo

8	Structural, compositional, and morphological evaluations of different grades of SiO ₂ , Si ₃ N ₄ and BN powders for brake disc application	HAL (Hindustan Aeronautics Limited)	Dr Prijat Pallab Jana and Dr Subrata Das
9	Evaluation of solid sorbents for co ₂ capture from simulated compositions of blast furnace top gas and stove waste gas	Tata Steel Ltd., Jamshedpur, Jharkhand	Dr U S Hareesh
10	Development of hard composites from leather industry scoring dust	PA Footwear Pvt. Ltd., Chennai	Dr Saju Pillai
11	Development of Mg alloy wire coils used in the ignition system of the sustained engine of Supersonic Cruise Missiles	DRDL, DRDO, Hyderabad	Dr A Srinivasan
12	Nano generators integrated smart tyre for kinetic energy harvesting and self-powered tyre condition monitoring applications	MRF, Chennai	Dr Achu Chandran
13	Manufacturing of innovative building materials from fine rock sand dust	Akashganga Biosciences Pvt. Ltd., Maharashtra	Dr S Ananthakumar
14	Extraction of mineral potash from rock-dust and subsequent utilization of the rejects/waste-sludge for making construction bricks	NS& Co., Trichy, Tamil Nadu	Dr M Sundararajan

CSR PROJECTS

1	Processing, standardization and application studies of D-Potash ash (dry and wet) for paints, fillers and building materials	M/s Aquagri Processing Pvt. Ltd.	Dr S Ananthakumar
2	Early detection of cancers from blood samples by Raman spectroscopy and artificial intelligence: clinical validation of a cutting-edge diagnostic technique	M/s Tata Elxsi Ltd.	Dr K K Maiti
3	Establishing a model community waste water treatment and reuse in Nemom block Panchayat, Kerala	Pai and Pai Chemicals Pvt. Ltd., Bangalore	Dr C Shermi

Technical Support Projects

1	Molecular investigation of potential PGPR bacterial isolates Phase- 1	Sri Bioaesthetics Pvt. Ltd.	Dr N Ramesh Kumar
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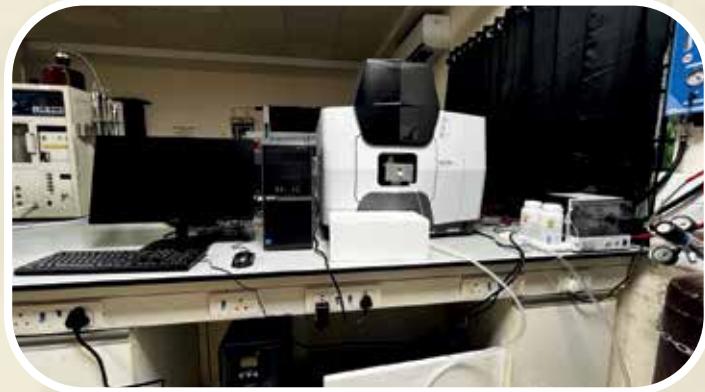
The background of the image features a large, abstract organic shape composed of white and light green colors. This shape is irregular, with various protrusions and indentations, resembling a stylized splash or a cloud. It is centered in the frame and occupies most of the vertical space.

New Facilities

New Facilities



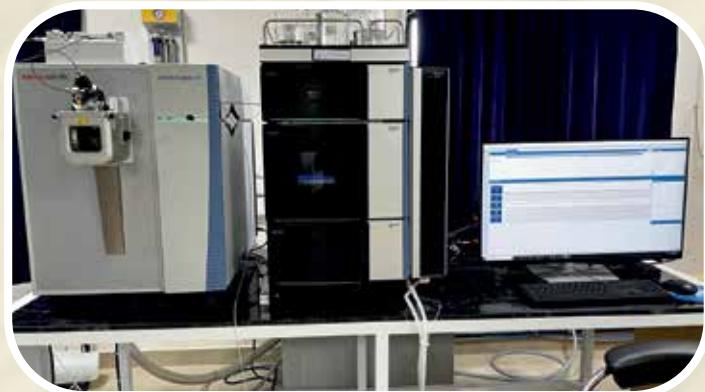
FE-SEM



**Atomic Absorption
Spectrophotometer**



**Single Crystal X-ray
Diffractometer**



HR LC-MS



Gold Testing Facility

The background of the image features a large, abstract shape composed of green and white organic, liquid-like forms. The green areas are at the top and bottom, while the white areas form a central, irregular shape containing the text. There are several small white circles of varying sizes scattered within the white area.

Management & Administration

Director's Scientific and Technical Unit



Dr. C. Anandharamakrishnan
(Director)



Mr. Raja Shekar K. L.
(Principal Private Secretary)



Dr. Ribin Jones S. B.
(Senior Principal Scientist)



Dr. Deepa Balan
(Senior Scientist)



Mr. Venkatesan J.
(Senior Scientist)



Dr. Vasanth Ragavan K.
(Senior Scientist)



Ms. Arya Senan M. C.
(Technical Assistant)



Ms. Sangeetha T. V.
(Assistant Section Officer - G)



Mr. Ashik Rasheed
(Staff Car Driver)

To enhance efficiency and strengthen the scientific and administrative functions of the Institute, the Director of CSIR-NIIST established the Director's Scientific and Technical Unit (DSTU). Serving as the central coordinating body, the DSTU oversees scientific activities, administrative file processing, institutional events, and day-to-day operational matters.

Beyond internal operations, the Unit plays a pivotal role in coordinating high-profile visits, organizing official tour programs, managing the Director's engagements, and facilitating media interactions.

During 2023-24, a dedicated workspace for the DSTU was established, equipped with the required infrastructure and resources to enable smooth functioning. The Unit is staffed by a Principal Private Secretary, a Senior Principal Scientist, three Senior Scientists, an Assistant Section Officer, a Technical Assistant, and a Staff Car Driver.

ADMINISTRATION



Left to right: 1st Row: Mr. P. Kalaiyarasu, Mr. Madhu K., Ms. Anija T S, Ms. Neethu S. Induchoodan (SO), Mr. G. Padmakumar (SO), Mr. Srinivasa Rao Yella (COA), Mr. K. L. Raja Shekar (PPS), Mr. Amit, Ms. Sajitha A. L.

Left to right: 2nd Row: Mr. Ramesh Kumar R. K., Ms. Arya Sasidharan, Ms. S. Devika, Ms. K. Preetha (SO), Ms. Sangeetha T. V.

Left to right: 3rd Row: Mr. Rithwik P. Das, Mr. Sajith P. S., Mr. Nithin C., Mr. Vishnu M. J., Mr. A. Sreekumaran

FINANCE AND ACCOUNTS



Left from first row: Mrs. Sheeba Saithu, Ms. Gayathri Jayan, Mrs. Anjali Rani (SO), Mrs. G. Geetha (SO), Mr. Shyam Sunder Singh (FAO), Mr. Sanjeev Sadanandan, Mr. Vishnu V.L., Mr. Sambhu Namboothiri

Left from Second row: Mr. Rejith P., Mr. Pranoy C. P., Mr. Madan Kumar C., Mr. Abhilash S., Ms. Chandra A., Mr. M. S. Krishnan Unni

STORES AND PURCHASE



Sitting from left to right:

Mr. Bhakthavalsalam G., Mrs. Latha L.,
Mr. Anil Kumar M, Mr. Shenbaganathan A.
(SPO), Mr. Raviswamy H. C. (SO),
Mr. Ghosh T. K.

Standing from left to right:

Mr. Anand Hari, Mrs. Geethu S., Mr. Arul
Prakash D., Mr. Ajayakumar B, Mr. Pavan
Kumar Meena

ENGINEERING SERVICES UNIT



NIIST DISPENSARY



Sitting from left to right:

Dr. Ansu A. Suresh (RMO),
Mrs. Sangeethalal E. P. (Staff Nurse)

The background of the image features a green-to-white gradient. Overlaid on this gradient are several white, organic, blob-like shapes of varying sizes and positions, creating a sense of depth and movement.

Events

India International Science Festival 2024

30 November – 3 December 2024, Guwahati

The 10th edition of the India International Science Festival (IISF 2024) was held from 30 November to 3 December 2024, at the Indian Institute of Technology (IIT) Guwahati, Assam. This marked the first time the festival was hosted in North East India. The event was organized by the Council of Scientific and Industrial Research (CSIR) and coordinated by CSIR-National Institute for Interdisciplinary Science and Technology (NIIST), Thiruvananthapuram. Key partners included the Department of Science and Technology (DST), Department of Biotechnology (DBT), Ministry of Earth Sciences (MoES), Department of Atomic Energy (DAE), Department of Space (DoS), IIT Guwahati, and Vijnana Bharati (VIBHA). The steering committee was chaired by Dr. N. Kalaiselvi, Secretary DSIR and Director General, CSIR and Dr. C. Anandharamakrishnan, Director, CSIR-NIIST was the Chief Coordinator and Nodal.

The India International Science Festival (IISF) 2024 was a grand celebration of science, technology, and innovation, blending education with creativity to inspire curiosity and empower youth across the nation. Through interactive exhibits, workshops, and thought-provoking talks, the festival connected scientists, students, teachers, and the public, bringing innovation to even the most remote communities. Special focus on women's development, teachers' empowerment, and North East India highlighted inclusivity and diversity in the nation's STI journey.

IISF 2024 showcased India's rise as a global hub for innovation, demonstrating affordable excellence, frugal innovations, and solutions for both domestic and international challenges. By nurturing talent, fostering collaboration, and celebrating scientific achievements, the festival affirmed India's leadership in Science, Technology, and Innovation, embodying the spirit of *Vasudhaiva Kutumbakam* and paving the way for future breakthroughs.

IISF 2024 was officially inaugurated by Dr. Himanta Biswa Sarma, Hon'ble Chief Minister of Assam in a grand opening ceremony presided over by Dr. Jitendra Singh, Hon'ble Minister for Science and Technology. Dr. V. K. Saraswat, Hon'ble Member, NITI Aayog, Shri Keshab Mahanta, Hon'ble Minister for Science, Technology and Climate Change, Govt. of Assam, Smt. Dasanglu Pul, Hon'ble Minister for Science and Technology, Govt. of Arunachal Pradesh, Prof. A. K. Sood, Hon'ble Principal Scientific Adviser to Govt. of India, and Secretaries to Government Departments graced the inaugural ceremony.

The theme of IISF 2024 was "Transforming India into a Science and Technology-driven Global Manufacturing Hub," aligning with national initiatives like "Make in India" and "Atmanirbhar Bharat." IISF 2024 involved 25 distinct events, with more than 150 technical sessions and panel discussions organized over 3 days. The magnanimity of the events could be understood from the presence of more than 500 resource persons and 7000+ registered participants attending the technical sessions. The total footfall for IISF 2024 over 4 days is estimated around 42,000, that averages to more than 10,000 attendees per day. More than 50% North East participation was ensured in almost all events at IISF 2024.

Given below are the thematic events organized as part of IISF 2024.

1. Curtain Raisers and Pre-IISF Events
2. Chandrayaan - The Museum of the Moon
3. Science-Technology-Defence-Space Exhibition – Sci-Tech Expo

4. Science Institutional Leaders Meet - Vision Sansad and Round Table on India as the Global Manufacturing Hub through Science and Technology
5. Focused S&T for the North East - Science Odyssey of the North East
6. Global Manufacturing Summit - Make in India, Make for the World
7. Students S&T Village - The New Nalanda
8. New Frontiers in S&T for Viksit Bharat 2047 - Pragya Bharat
9. Women's Development to Women-led Development in S&T - Nari Shakti
10. Ideas for Viksit Bharat - S&T Hackathon
11. Empowering the Youth - Young Scientists Conclave
12. Aspiring Educators and Teachers Workshop - The Gurukula
13. Innovation, Technology and Entrepreneurship - Mission Start-up
14. Transformation through New Age Technologies - Reimagining Bharat Exhibition
15. Meteorology, Oceanography and Ecology - Sagarika – The Tale of Earth Sciences
16. Global S&T Alliance - Science Beyond Borders
17. Science Literature Festival – Vigyanika
18. Nuclear Energy for Self-Reliant India - Fusion Forum – The Atomic Assembly
19. Student - Scientist Interaction Program - Face to Face with New Frontiers in S&T
20. National Social Organisations and Institutions Meet – NSOIM
21. Science through Games and Adventures - Science Safari
22. Science, Technology, Communication and Media - Media Conclave
23. North East Food Street - The Taste of the Hills
24. Laser Show - Saga of Science Chronicles

The Valedictory was conducted on 3 December 2024 at 2:00 pm at the Main Hall of IISF 2024. The session was chaired by Dr. (Mrs.) N. Kalaiselvi, Secretary, DSIR and DG, CSIR and inaugurated by Shri Keshab Mahanta, Hon'ble Minister for Science, Technology and Climate Change, Government of Assam. Dr. C. Anandharamakrishnan, Director, CSIR-NIIST and Chief Coordinator and Nodal of IISF 2024 delivered the welcome address and presented a brief report on IISF 2024. Dr. V. M. Tiwari, Director, CSIR-NEIST and Prof. Subhendu Sekhar Bag, Associate Dean, IIT Guwahati addressed the gathering. The winners of the Mega Expo and S&T Hackathon were honored in the session, which came to an end by a formal Vote of Thanks proposed by Shri P. A. Vivekananda Pai, Secretary General, Vijnana Bharati.

IISF 2024 masterfully blended scientific rigor with festive celebration, engaging participants across thematic sessions that featured active deliberations and collaborations. Nearly half of the events were new or redesigned, reflecting the scale and ambition of the festival. Showcasing India's prowess in affordable excellence and frugal innovation, IISF 2024 reinforced the nation's growing global stature in Science, Technology, and Innovation (STI) while inspiring both domestic and international audiences. With a special focus on North East India, the festival embraced diverse voices and fostered inclusive knowledge-sharing, highlighting India's emerging role as a global innovation hub, particularly in the manufacturing sector. By nurturing talent, encouraging collaboration, and celebrating creativity, IISF 2024 stood as a luminous testament to India's commitment to advancing science and technology for societal and global benefit.



13 May 2024

National Technology Day

CSIR-NIIST celebrated National Technology Day on 13 May 2024, beginning with an inaugural session at 11:00 AM. Dr. U.S. Hareesh, Head, HRAD, delivered the welcome address, followed by the Presidential Address by Director Dr. C. Anandharamakrishnan. A key highlight was the signing of an MoU between CSIR-NIIST and NIT Calicut, exchanged by Dr. Anandharamakrishnan and Prof. Prasad Krishna, Director, NIT Calicut, to promote collaborative research in advanced scientific domains. Prof. Krishna also delivered an engaging lecture and interacted with the student participants, expressing high expectations from the future generation of scientists. Dr. Joshy Joseph, Principal Scientist & Jigyasa Coordinator, proposed the vote of thanks. As part of the celebrations, CSIR-NIIST Jigyasa organised a Scientist-Student Interaction Program and R&D facility visits. The event saw the participation of 134 students (78 girls and 56 boys) from various schools and colleges.



19 July 2024 One Week One Theme (OWOT) Program

As part of CSIR's *One Week One Theme (OWOT)* programme on Chemicals and Petrochemicals, CSIR-NIIST organized a *National Thematic Conclave on Specialty Chemicals and Sustainable Packaging* on 19 July 2024. The conclave focused on advancements in specialty chemicals, sustainable polymers, and eco-friendly packaging solutions. Experts from academia, industry, and government deliberated on their environmental and industrial impacts, while highlighting innovations and fostering collaborations to accelerate deployment of sustainable technologies. The daylong event featured technical sessions, panel discussions, a Research Scholar Symposium with oral presentations, and R&D facility visits. Over 300 students and scholars from various institutions and CSIR-NIIST participated.



15 August 2024 Independence Day, 2024

CSIR-NIIST celebrated the 79th Independence Day on the 15th August, 2024. Director, CSIR-NIIST hoisted the national flag and staff, students and retired employees participated actively in the celebration.



19-22 September 2024 World Food India 2024

CSIR actively participated in *World Food India 2024*, a flagship event organised by the Ministry of Food Processing Industries. Coordinated by CSIR-NIIST, five CSIR labs — NIIST, CFTRI, NEIST, IHBT, and IICT — showcased their technologies and products at a dedicated 140 sq. m. central stall, ensuring maximum visibility. Start-ups that commercialised CSIR technologies also exhibited alongside. The CSIR stall drew significant attention from ministry officials, industry leaders, and international delegates. CSIR representatives also participated in sessions and panel discussions, delivering a key talk on *Sustainability in Food Packaging*.



17- 30 September 2024 Hindi Fortnight Celebration

Conducted on 17th to the 30th of September 2024. The celebration aimed at promoting the widespread appreciation and understanding of the Hindi language among staff, students, and contract staff within the institution. Various competitions like Tazveer Kya Kehati Hai, Memory Test, Hindi Essay writing, Poster Making, Antakshari, Hindi Solo Song and Hindi puzzle were also conducted during the celebration.



7 October 2024

CSIR & CSIR-NIIST Foundation Day- Open Day

CSIR-NIIST Jigyasa organized an *Open Day* on 7 October 2024 as part of the institute's Foundation Day celebrations. The event began with an inaugural ceremony featuring a welcome address by Dr. U.S. Hareesh and a presidential address by Director Dr. C. Anandharamakrishnan. Guest of Honor Dr. Atanu Ranjan Pal (CTO – Process, Tata Steel) addressed the audience, followed by the Foundation Day Lecture by Dr. Ashutosh Sharma, President, INSA, on "Science and Scientists in the New Millennium: Brave New World."

Key highlights included the signing of an MoU with Tata Steel Ltd., a technology transfer to Leafy Leather Pvt. Ltd., and the release of the *CSIR-NIIST Annual Report 2023–24*. The institute also felicitated long-serving employees, retirees, and meritorious students. Shri S. Antony Peter Raja delivered the vote of thanks. In the afternoon, Dr. Deeksha Awasthi delivered a session on "Research and Mental Resilience." The Open Day drew participation from 906 students and 72 teachers from 22 institutions, who toured research labs and engaged in science-themed games and activities.



8 October 2024

Swachhata Hi Sava Campaign, 2024

As a part of Swachhata Hi Seva Campaign, 2024 a mass cleanliness drive was conducted at CSIR-NIIST on 8th October, 2024. In addition to that, a cleaning programme was also organized at Nemom railway Station on 8th October, 2024.



17 October 2024

Inauguration of the Centre for Gold Assay and Hallmarking

The Centre for Gold Assay and Hallmarking at CSIR-NIIST in Thiruvananthapuram, Kerala, is a state-of-the-art facility dedicated to ensuring the authenticity and purity of gold jewelry. Officially inaugurated on October 17, 2024, by Dr. Jitendra Singh, Minister of State for Science and Technology, the Centre is equipped with advanced technologies like the Energy Dispersive X-Ray Fluorescence (ED-XRF) machine for non-destructive gold purity analysis and a laser engraving machine for precise hallmarks. Other key facilities include a cupola furnace for fire assay testing, an annealing furnace for controlled heat treatment, and precision weighing balances. These advanced tools ensure the highest standards of quality control and reliability in gold testing and hallmarking, fostering trust in the gold industry.



17 October 2024

Inauguration of the NIIST Exhibition Area

Dr. Jitendra Singh, Hon'ble Minister of Science & Technology, inaugurated the newly established exhibition area at CSIR-NIIST! This space showcases our cutting-edge research, innovations, and contributions across various fields.



8 January 2025 Inauguration of the VIP Lounge



Dr. (Mrs.) N. Kalaiselvi, Secretary DSIR and Director General CSIR, inaugurated the newly set-up state-of-the-art VIP Lounge at CSIR-NIIST. The facility is designed to provide a welcoming and comfortable environment for distinguished guests.

8 January 2025 Inauguration of the Glycemic Index Research Unit



Dr. (Mrs.) N. Kalaiselvi, the Director General of CSIR and Secretary of DSIR, officially inaugurated the Glycemic Index Research Unit at the campus on January 8, 2025. This newly established unit is dedicated to facilitating research in the areas of glycemic index, nutrient absorption behavior, and the dynamics of food digestion.

8 January 2025

Inauguration of the Single Crystal X-ray Diffraction Facility



Dr. (Mrs.) N. Kalaiselvi, Secretary, DSIR and DG CSIR, inaugurated the new X-Ray Diffraction Facility at CSIR-NIIST on 8th January 2025. The state-of-the-art Rigaku Oxford XtaLAB Synergy-S is equipped with a PhotonJet-S Cu-source, kappa goniometer, and a HPC hybrid photon counting detector for small molecule 3D structure analysis.

26 January 2025

Republic Day 2025

CSIR-NIIST celebrated the 76th Republic Day on 26th January, 2025. Director, CSIR-NIIST hoisted the national flag and staff, students and retired employees participated actively in the celebration.



28 February 2025

National Science Day 2025

CSIR-NIIST marked National Science Day on 28 February 2025 with a series of engaging events, including a Science Outreach Program, Energy Literacy Training, R&D Facility Visits, and Science Game Stations, aimed at fostering scientific curiosity and awareness. The event was inaugurated by Prof. Rohit Srivastava (Vigyan Shri 2024 awardee, IIT Bombay), who also delivered the National Science Day lecture, emphasizing the transformative role of science in societal progress.

A total of 465 students and 37 teachers from 14 institutions participated. A key highlight was the Energy Literacy Training session led by Dr. K. N. Narayanan Unni, Head, C-SET, attended by 265 students, who also pledged to adopt sustainable energy practices. Participants explored cutting-edge research labs and enjoyed interactive Science Game Stations that promoted critical thinking and scientific engagement. The celebration successfully inspired young minds to embrace science and sustainability.

3-9 March 2025

International Women's Day, 2025

The International Women's Day was celebrated at CSIR-NIIST. The events conducted as part of the programme focused on empowering women, promoting gender equality, and raising awareness about critical aspects of women's health, fitness, nutrition, and overall well-being. The celebrations saw enthusiastic participation from CSIR-NIIST staff, volunteers, and several distinguished speakers, creating an event that was both educational and motivational.



Vigilance Awareness Week-2024

As part of the observance of Vigilance Awareness Week 2024, a comprehensive three-month campaign on Preventive Vigilance was organized at CSIR-NIIST, Thiruvananthapuram, from 16th August to 15th November 2024. The campaign focused on five major areas—Capacity Building, Identification and Implementation of Systemic Improvement Measures, Updation of Circulars, Guidelines and Manuals, Timely Disposal of Complaints, and Dynamic Digital Presence.



A wide spectrum of activities and outreach programs were undertaken both within the Institute and beyond its campus to foster vigilance awareness among employees and the public. The key initiatives encompassed capacity-building workshops/sensitization sessions, and training programs for staff members; the implementation of online portals for guest house booking, project student intake, and the Project Management System (PMS) for the PME Division. A series of competitions such as debates, essay writing, elocution, quiz, poster designing, and cartoon drawing, were also conducted during the campaign period.

Bio-Electrochemical (BEC) Technology for Bio-Hydrogen (Green H₂) Production from Wastewater

Under the CSIR-Hydrogen Technology Mission (H2T), CSIR-NIIST developed a solar-assisted integrated bio-electrochemical reactor system (BEC) for the simultaneous production of green hydrogen and clean water from domestic/municipal wastewater. The BEC enhances the metabolic activity of electroactive biocatalysts by supplying key nutrients and electron donors/acceptors, promoting organic contaminant breakdown alongside bio-H₂ generation. A 2,000-litre pilot plant has been designed and commissioned at CSIR-NIIST. This innovative BEC technology offers a sustainable, green solution for hydrogen production coupled with efficient wastewater remediation.



IG, 2 G ethanol and biofuels – process development, analyses and pilot scale operation

Pilot scale demonstration and visit to BPCL, Ernakulam



Sanitation Capacity Building Programme for SEUF Officers

CSIR-NIIST organized a training program for officers of the Socio-Economic Unit Foundation (SEUF) focused on grey water treatment and solid waste management. The program aimed to enhance practical skills in managing household wastewater and promoting sustainable waste practices. Key technologies such as anaerobic digestion and composting were covered, enabling participants to implement effective community-level solutions. The initiative supports sustainable water use, resource recovery, and strengthened environmental stewardship at the grassroots level.



Introduction to Life Cycle Assessment Studies In Bioprocessing and Chemical Engineering – Phase II

Course coordinated at CSIR NIIST for participants from IITs, NITs Oil manufacturing companies and industry personnels.



13 मई 2024

राष्ट्रीय प्रौद्योगिकी दिवस

राष्ट्रीय प्रौद्योगिकी दिवस का आयोजन 13 मई 2024 को सीएसआईआर-एनआईआईएसटी में किया गया। राष्ट्रीय प्रौद्योगिकी दिवस समारोह का उद्घाटन सत्र पूर्वाहन 11:00 बजे हुआ, जिसमें डॉ. यू.एस. हरीश, प्रमुख, एचआरएडी, सीएसआईआर-एनआईआईएसटी ने स्वागत भाषण दिया, और डॉ. सी. आनंदरामकृष्णन, निदेशक, सीएसआईआर-एनआईआईएसटी ने अध्यक्ष भाषण दिया। डॉ. सी. आनंदरामकृष्णन और प्रोफेसर प्रसाद कृष्ण, निदेशक, एनआईटी, कैलिकट ने महत्वपूर्ण क्षेत्रों में शोध को बढ़ावा देने के लिए समझौता जापन का आदान-प्रदान किया। डॉ. सी. आनंदरामकृष्णन ने कहा कि यह साझेदारी एनआईटी-सी के छात्रों के लिए वैज्ञानिक क्षेत्रों में अनुसंधान के अवसर खोलता है। माननीय अतिथि प्रोफ. प्रसाद कृष्ण ने एक संवादात्मक व्याख्यान दिया और छात्रों के साथ बातचीत की। उन्होंने छात्रों से अपनी उच्च अपेक्षाएँ साझा कीं और उनकी सराहना की। डॉ. जोशी जोसफ, प्रमुख वैज्ञानिक एवं जिजासा समन्वयक, सीएसआईआर-एनआईआईएसटी ने धन्यवाद जापित किया। इस अवसर पर, सीएसआईआर-एनआईआईएसटी जिजासा ने वैज्ञानिक-छात्र संवाद कार्यक्रम और अनुसंधान एवं विकास सुविधाओं का दौरा आयोजित किया। विभिन्न शैक्षणिक संस्थानों के लगभग 134 छात्र (78 छात्राएँ और 56 छात्र) इस कार्यक्रम में शामिल हुए।

19 जुलाई 2024

एक सप्ताह एक थीम

सीएसआईआर के एक सप्ताह एक थीम कार्यक्रम के तहत, (चमड़ा सहित) और शैल रसायन (CLP) पर आधारित, सीएसआईओआर-राष्ट्रीय अंतर्विषयी विज्ञान तथा प्रौद्योगिकी संस्थान (सीएसआईआर-एनआईआईएसटी) ने 19 जुलाई 2024 को 'विशेष रसायन और संधारणीय पैकेजिंग पर राष्ट्रीय थीमेटिक कॉकलेव' का आयोजन किया। विशेष रसायन, संधारणीय बहुलक और पैकेजिंग समाधानों के क्षेत्रों में प्रगति पर विचार किया गया और उनके पर्यावरण एवं उद्योग पर प्रभाव पर विशेषज्ञ, वक्ता और प्रतिनिधियों द्वारा चर्चा की गई। इस अवसर पर नवीनतम वैज्ञानिक और तकनीकी नवाचारों को भी उजागर किया गया और उद्योग सहयोग को प्रोत्साहित किया गया ताकि अगली पीढ़ी की संधारणीय तकनीकों और उत्पादों को तेजी से लागू किया जा सके। साथ ही, सरकार, शैक्षणिक संस्थानों और उद्योग के बीच नेटवर्क बनाने के प्रयास किए गए ताकि प्रौद्योगिकी/निर्माण तत्परता स्तरों को बढ़ाया जा सके और विभिन्न हिस्सों के हितधारकों के बीच जागरूकता फैलायी जा सके। सीएसआईआर-एनआईआईएसटी में आयोजित इस कार्यक्रम में तकनीकी सत्र, पैनल चर्चा, शोध छात्र संगोष्ठी जिसमें शोध छात्रों द्वारा मौखिक प्रस्तुतियाँ शामिल थीं, और अनुसंधान एवं विकास सुविधाओं का दौरा शामिल था। विभिन्न संस्थानों और सीएसआईआर-एनआईआईएसटी के कुल 300 छात्र और शोधकर्ता इस पूरे दिन चलने वाले कार्यक्रम में शामिल हुए।

15 अगस्त 2025

स्वतंत्रता दिवस, 2025

सीएसआईआर-एनआईआईएसटी में 15 अगस्त 2025 को 79वाँ स्वतंत्रता दिवस मनाया गया। निदेशक, सीएसआईआर-एनआईआईएसटी द्वारा राष्ट्रीय ध्वज फहराया गया। इस अवसर पर संस्थान के कर्मचारियों, विद्यार्थियों तथा सेवानिवृत कर्मचारियों ने उत्साहपूर्वक एवं सक्रिय रूप से समारोह में भाग लिया।

22-19 सितंबर 2024

विश्व खाद्य भारत 2024

विश्व खाद्य भारत 2024 का आयोजन 19-22 September 2024 के दौरान नई दिल्ली के प्रगति मैदान स्थित भारत मंडपम में किया गया। यह खाद्य उद्योग का एक मेंगा आयोजन था, जिसका आयोजन खाद्य प्रसंस्करण उद्योग मंत्रालय (MoFPI) द्वारा किया गया। सीएसआईआर ने विश्व खाद्य भारत 2024 में भाग लिया, जिसमें सीएसआईआर की 5 प्रयोगशालाओं—सीएसआईआर-एनआईआईएसटी, सीएसआईआर-सीएफटीआरआई, सीएसआईआर-एनईआईएसटी, सीएसआईआर-आईएचबीटी तथा सीएसआईआर-आईआईसीटी—ने अपनी प्रक्रियाओं एवं उत्पादों का प्रदर्शन किया। इस प्रदर्शनी का समन्वय सीएसआईआर-एनआईआईएसटी, तिरुवनंतपुरम द्वारा किया गया। सीएसआईआर का प्रदर्शनी हॉल के केंद्र में अधिकतम दृश्यता के लिए 140 वर्ग मीटर क्षेत्रफल का एक समर्पित एवं विशिष्ट स्टॉल था। सीएसआईआर प्रयोगशालाओं के साथ-साथ, सीएसआईआर प्रयोगशालाओं से प्रौद्योगिकियाँ प्राप्त करने वाले स्टार्ट-अप्स ने भी अपने उत्पादों का प्रदर्शन किया। विभिन्न मंत्रालयों के वरिष्ठ अधिकारी, अग्रणी खाद्य उद्योगों के प्रतिनिधि तथा विदेशी प्रतिनिधिमंडलों ने सीएसआईआर स्टॉल का अभ्यास किया, जिससे प्रदर्शनी के दौरान स्टॉल पर निरंतर चहल-पहल बनी रही। इसके अतिरिक्त, सीएसआईआर ने विश्व खाद्य भारत के विभिन्न सत्रों एवं पैनल चर्चाओं का संचालन किया, उनमें भाग लिया तथा खाद्य पैकेजिंग क्षेत्र में सततता पर एक व्याख्यान भी प्रस्तुत किया।

17 से 30 सितंबर 2024

हिंदी पखवाड़ा समारोह

हिंदी पखवाड़ा समारोह का आयोजन 17 से 30 सितंबर 2024 के दौरान किया गया। इस समारोह का उद्देश्य संस्थान के कर्मचारियों, विद्यार्थियों तथा संविदा कर्मचारियों के बीच हिंदी भाषा के व्यापक प्रचार-प्रसार, सराहना एवं समझ को बढ़ावा देना था। समारोह के दौरान तस्वीर क्या कहती है, स्मृति परीक्षा, हिंदी निबंध लेखन, पोस्टर निर्माण, अंताक्षरी, हिंदी एकल गीत तथा हिंदी पहेली जैसी विभिन्न प्रतियोगिताओं का भी आयोजन किया गया।

7 अक्टूबर 2024

सीएसआईआर एवं सीएसआईआर-एनआईआईएसटी स्थापना दिवस - भ्रमण दिवस

सीएसआईआर-एनआईआईएसटी जिजासा ने 7 अक्टूबर 2024 को सीएसआईआर-एनआईआईएसटी स्थापना दिवस के अवसर पर भ्रमण दिवस का आयोजन किया। कार्यक्रम का शुभारंभ पूर्वाह्न 10:00 बजे उद्घाटन समारोह के साथ हुआ। डॉ. यू.एस. हरीश, प्रमुख, एचआरएडी, सीएसआईआर-एनआईआईएसटी ने सभी का स्वागत किया और डॉ. सी. आनंदरामकृष्णन, निदेशक, सीएसआईआर-एनआईआईएसटी ने अध्यक्ष भाषण दिया। कार्यक्रम के विशिष्ट अतिथि डॉ. अतनु रंजन पाल, मुख्य प्रौद्योगिकी अधिकारी (प्रोसेस), टाटा स्टील लिमिटेड, जमशेदपुर ने भी सभा को संबोधित किया। इसके पश्चात, मुख्य अतिथि डॉ. अशुतोष शर्मा, अध्यक्ष, इंडियन नेशनल साइंस एकेडमी; पूर्व सचिव, विज्ञान एवं प्रौद्योगिकी विभाग, भारत सरकार; इंस्टीट्यूट चेयर प्रोफेसर एवं INAE विश्वविद्यालय चेयर प्रोफेसर, आईआईटी कानपुर द्वारा 'नए सहस्राब्दी में विज्ञान और वैज्ञानिक: एक सशक्त नई दुनिया' विषय पर स्थापना दिवस व्याख्यान प्रस्तुत किया गया। इस अवसर पर सीएसआईआर-एनआईआईएसटी और टाटा स्टील लिमिटेड, जमशेदपुर के बीच समझौता जापन पर हस्ताक्षर किए गए, और सीएसआईआर-एनआईआईएसटी और लीफी लेदर प्राइवेट लिमिटेड, सूरत, गुजरात के बीच प्रौद्योगिकी हस्तांतरण भी संपन्न हुआ। कार्यक्रम के दौरान सीएसआईआर-एनआईआईएसटी की वार्षिक रिपोर्ट 2023-2024 का भी विमोचन किया गया। समारोह में परिषद में 25 वर्ष की सेवा पूर्ण करने वाले कर्मचारियों, वर्ष 2023-2024 के सेवानिवृत्त कर्मचारियों तथा एनआईआईएसटी परिवार के मेधावी विद्यार्थियों को सम्मानित

किया गया। औपचारिक सत्र का समापन श्री एस. आंटणी पीटर राजा, प्रशासनिक अधिकारी, सीएसआईआर-एनआईआईएसटी द्वारा धन्यवाद प्रस्ताव के साथ हुआ। अपराह्न सत्र में डॉ. दीक्षा अवस्थी, संस्थापक, दीक्षा लाइफ एवं ग्लोबल मैंटल हेल्थ एंबेसडर ने 'अनुसंधान और मानसिक सुदृढ़ता' विषय पर व्याख्यान दिया।

इस कार्यक्रम में 22 संस्थानों (1 विद्यालय और 21 महाविद्यालय) से लगभग 906 विद्यार्थी (307 छात्र और 599 छात्राएँ) तथा 72 शिक्षक (29 पुरुष और 43 महिलाएँ) सम्मिलित हुए। प्रतिभागियों ने सीएसआईआर-एनआईआईएसटी की अनुसंधान सुविधाओं एवं प्रयोगशालाओं का भ्रमण किया तथा खेल स्टेशनों में भी भाग लिया।

8 अक्टूबर 2024

स्वच्छता ही सेवा अभियान, 2024

स्वच्छता ही सेवा अभियान, 2024 के उपलक्ष्य में 8 अक्टूबर 2024 को सीएसआईआर-एनआईआईएसटी में बड़े पैमाने पर स्वच्छता अभियान आयोजित किया गया। इसके अतिरिक्त, 8 अक्टूबर 2024 को नेमम रेलवे स्टेशन पर भी स्वच्छता कार्यक्रम का आयोजन किया गया।

17 अक्टूबर 2024

स्वर्ण मूल्यांकन एवं हॉलमार्किंग केंद्र का उद्घाटन

केरल के तिरुवनंतपुरम स्थित सीएसआईआर-एनआईआईएसटी में स्थापित स्वर्ण परख एवं हॉलमार्किंग केंद्र स्वर्ण आभूषणों की प्रामाणिकता एवं शुद्धता सुनिश्चित करने हेतु समर्पित एक अत्याधुनिक सुविधा है। इस केंद्र का उद्घाटन 17 अक्टूबर 2024 को डॉ. जितेन्द्र सिंह, माननीय राज्य मंत्री (विज्ञान और प्रौद्योगिकी) द्वारा किया गया। यह केंद्र अविनाशात्मक स्वर्ण शुद्धता विश्लेषण के लिए एनर्जी डिस्पर्सिव एक्स-रे फ्लोरेसेंस (ED-XRF) मशीन तथा सटीक हॉलमार्क अंकन हेतु लेजर उत्कीर्णन मशीन जैसी उन्नत प्रौद्योगिकियों से सुसज्जित है। अन्य प्रमुख सुविधाओं में अग्नि आमापन परीक्षण के लिए क्यूपोला भट्टी, नियंत्रित ऊष्मा उपचार के लिए अनीलन भट्टी, तथा उच्च परिशुद्धता तौल तराजू शामिल हैं। ये उन्नत उपकरण स्वर्ण परीक्षण एवं हॉलमार्किंग में गुणवत्ता नियंत्रण और विश्वसनीयता के सर्वोच्च मानकों को सुनिश्चित करते हैं तथा स्वर्ण उद्योग में विश्वास को सुदृढ़ बनाते हैं।

17 अक्टूबर 2024

एनआईआईएसटी प्रदर्शनी क्षेत्र का उद्घाटन

डॉ. जितेन्द्र सिंह, माननीय विज्ञान एवं प्रौद्योगिकी मंत्री ने सीएसआईआर-एनआईआईएसटी में नवस्थापित प्रदर्शनी क्षेत्र का उद्घाटन किया। यह क्षेत्र हमारे अत्याधुनिक शोध, नवाचारों और विभिन्न क्षेत्रों में किए गए योगदानों को प्रदर्शित करता है।

8 जनवरी 2025

वीआईपी प्रतीक्षालय का उद्घाटन

डॉ. (श्रीमती) एन. कलैसेल्वी, सचिव डीएसआईआर एवं महानिदेशक, सीएसआईआर, ने सीएसआईआर-एनआईआईएसटी में नवस्थापित अत्याधुनिक वीआईपी प्रतीक्षालय का उद्घाटन किया। यह सुविधा विशिष्ट अतिथियों के लिए एक स्वागतयोग्य और आरामदायक वातावरण प्रदान करने के उद्देश्य से अभिकल्पित की गई है।

8 जनवरी 2025

ग्लाइसीमिक इंडेक्स अनुसंधान इकाई का उद्घाटन

डॉ. (श्रीमती) एन. कलैसेल्वी, महानिदेशक, सीएसआईआर एवं सचिव, डीएसआईआर ने 8 जनवरी 2025 को परिसर में ग्लाइसीमिक इंडेक्स अनुसंधान इकाई का औपचारिक उद्घाटन किया। यह नवस्थापित इकाई ग्लाइसीमिक इंडेक्स, पोषक तत्वों के अवशोषण व्यवहार और खाद्य पाचन की गतिशीलता के क्षेत्रों में अनुसंधान को बढ़ावा देने के लिए समर्पित है।

8 जनवरी 2025

एकल क्रिस्टल एक्स-रे विवर्तन सुविधा का उद्घाटन

डॉ. (श्रीमती) एन. कलैसेल्वी, सचिव, डीएसआईआर एवं महानिदेशक, सीएसआईआर ने 8 जनवरी 2025 को सीएसआईआर-एनआईआईएसटी में नई एक्स-रे विवर्तन सुविधा का उद्घाटन किया। अत्याधुनिक Rigaku Oxford XtaLAB Synergy-S उपकरण में PhotonJet -S Cu-source, काप्पा गोनियोमीटर और छोटे अणुओं की त्रि-आयामी संरचना विश्लेषण के लिए HPC हाइब्रिड फोटॉन काउंटिंग डिटेक्टर जैसी सुविधाएं उपलब्ध हैं।

26 जनवरी 2025

गणतंत्र दिवस, 2025

सीएसआईआर-एनआईआईएसटी में 26 जनवरी 2025 को 76वाँ गणतंत्र दिवस समारोह मनाया गया। निदेशक, सीएसआईआर-एनआईआईएसटी द्वारा राष्ट्रीय ध्वज फहराया गया तथा कर्मचारियों, विद्यार्थियों और सेवानिवृत्त कर्मचारियों ने समारोह में सक्रिय रूप से भाग लिया।

28 फरवरी 2025

राष्ट्रीय विज्ञान दिवस 2025

सीएसआईआर-एनआईआईएसटी ने 28 फरवरी 2025 को राष्ट्रीय विज्ञान दिवस मनाने के उपलक्ष्य में कार्यक्रमों की एक व्यापक शृंखला का आयोजन किया। इन आयोजनों में विज्ञान आउटरीच कार्यक्रम, ऊर्जा साक्षरता प्रशिक्षण, सुविधा भ्रमण तथा विज्ञान गेम स्टेशन शामिल थे, जिनका उद्देश्य वैज्ञानिक जागरूकता एवं ज्ञान को बढ़ावा देना था।

कार्यक्रम का उद्घाटन प्रो. रोहित श्रीवास्तव, विज्ञान श्री-2024 पुरस्कार प्राप्तकर्ता एवं हिमांशु पटेल, चेयर प्रोफेसर, आईआईटी बॉम्बे द्वारा किया गया। उन्होंने राष्ट्रीय विज्ञान दिवस व्याख्यान भी प्रस्तुत किया। प्रो. श्रीवास्तव के भाषण में समाज की प्रगति में विज्ञान एवं प्रौद्योगिकी की महत्वपूर्ण भूमिका पर प्रकाश डाला गया तथा उपस्थित प्रतिभागियों को नवाचार अपनाने के लिए प्रेरित किया।

इस कार्यक्रम में 14 संस्थानों से 465 विद्यार्थी एवं 37 शिक्षक शामिल हुए। प्रतिभागियों को सीएसआईआर-एनआईआईएसटी की विभिन्न अनुसंधान इकाइयों एवं अत्याधुनिक सुविधाओं का भ्रमण करने का अवसर प्राप्त हुआ, जिससे उन्हें नवीनतम वैज्ञानिक कार्यों और नवाचारों की जानकारी मिली।

दिन के प्रमुख आकर्षणों में से एक ऊर्जा साक्षरता प्रशिक्षण रहा, जिसे डॉ. के. एन. नारायणन उन्नी, प्रमुख, सी-सेट, सीएसआईआर-एनआईआईएसटी द्वारा आयोजित किया गया। इस सत्र में 265 विद्यार्थियों ने भाग लिया। प्रशिक्षण का मुख्य उद्देश्य ऊर्जा संरक्षण, सततता तथा ऊर्जा संबंधी चुनौतियों के समाधान में विज्ञान

की भूमिका पर जागरूकता बढ़ाना था। इस अवसर पर विद्यार्थियों ने जिम्मेदार ऊर्जा व्यवहार अपनाने की शपथ भी ली।

कार्यक्रम में विज्ञान खेल स्टेशन भी थे, जहां छात्रों ने मजेदार और शैक्षिक खेलों में भाग लिया, जो उनके वैज्ञानिक ज्ञान और समस्या-समाधान क्षमता को परखता है। सीएसआईआर-एनआईआईएसटी में राष्ट्रीय विज्ञान दिवस समारोह विज्ञान और ऊर्जा साक्षरता में रुचि बढ़ाने में अत्यंत सफल रहे, और छात्रों को अपने चारों ओर की दुनिया के बारे में आलोचनात्मक रूप से सोचने के लिए प्रेरित किया।

9-3 मार्च 2025

अंतरराष्ट्रीय महिला दिवस 2025

अंतरराष्ट्रीय महिला दिवस का आयोजन सीएसआईआर-एनआईआईएसटी में 3 से 9 मार्च 2025 तक किया गया। कार्यक्रम के अंतर्गत आयोजित गतिविधियों का उद्देश्य महिलाओं को सशक्त बनाना, लिंग समानता को बढ़ावा देना और महिलाओं के स्वास्थ्य, फिटनेस, पोषण और समग्र कल्याण के महत्वपूर्ण पहलुओं के प्रति जागरूकता फैलाने पर केंद्रित था। इस आयोजन में सीएसआईआर-एनआईआईएसटी के कर्मचारियों, स्वयंसेवकों और कई प्रतिष्ठित वक्ताओं ने उत्साहपूर्वक भाग लिया, जिससे यह आयोजन शैक्षिक और प्रेरक दोनों रूपों में सफल रहा।

16 अगस्त से 15 नवम्बर 2024

सतर्कता जागरूकता सप्ताह 2024-

सतर्कता जागरूकता सप्ताह 2024 के अवसर पर, सीएसआईआर-एनआईआईएसटी, तिरुवनंतपुरम में 16 अगस्त से 15 नवम्बर 2024 तक निवारक सतर्कता पर एक व्यापक तीन महीने का अभियान चलाया गया। यह अभियान पाँच प्रमुख क्षेत्रों पर केंद्रित था—क्षमता निर्माण, प्रणालीगत सुधार उपायों की पहचान और क्रियान्वयन, परिपत्र, दिशा-निर्देश और मैनुअल का अद्यतन, शिकायतों का समय पर निपटान, और गतिशील डिजिटल उपस्थिति।

संस्थान के भीतर और परिसर के बाहर दोनों ही जगहों पर कर्मचारियों और जनता में सतर्कता जागरूकता बढ़ाने के लिए विभिन्न गतिविधियाँ और आउटरीच कार्यक्रम आयोजित किए गए। प्रमुख पहलों में कर्मचारियों के लिए क्षमता निर्माण कार्यशालाएँ/संवेदनशीलता सत्र और प्रशिक्षण कार्यक्रम शामिल थे; अतिथि गृह बुकिंग, परियोजना छात्र भर्ती, और पीएमई डिवीजन के लिए प्रोजेक्ट प्रबंधन प्रणाली के ऑनलाइन पोर्टलों का कार्यान्वयन भी किया गया। अभियान अवधि के दौरान वाद-विवाद, निबंध लेखन, वक्तृत्व, प्रश्नोत्तरी, पोस्टर डिजाइनिंग और कार्टून ड्राइंग जैसी प्रतियोगिताओं की भी श्रृंखला आयोजित की गई।

अपशिष्ट जल से जैव-हाइड्रोजन (ग्रीन H₂) उत्पादन के लिए जैव-विद्युत्रासायनिक (BEC) प्रौद्योगिकी

सीएसआईआर- हाइड्रोजन प्रौद्योगिकी मिशन (H2T) परियोजना के अंतर्गत सौर-सहायित एकीकृत जैव-विद्युत्रासायनिक रिएक्टर प्रणाली (BEC) विकसित की गई, जिसका उद्देश्य प्रचुर मात्रा में उपलब्ध घरेलू/नगर निगम के अपशिष्ट जल से एक साथ जैव-हाइड्रोजन और स्वच्छ पानी का उत्पादन करना है। विकसित BEC प्रौद्योगिकी का लक्ष्य विद्युत्रासायनिक रूप से सक्रिय जैव-उत्प्रेरक की चयापचय गतिविधि को बढ़ाना है, जिसके लिए अवयवी/अकार्बनिक पोषक तत्व, इलेक्ट्रॉन स्वीकर या दाता प्रदान किए जाते हैं। यह प्रक्रिया जैव-हाइड्रोजन उत्पादन और स्वच्छ जल सूजन के लिए जैविक संदूषकों के ऑक्सीकरण या अपचयन को उत्तेजित करती है। विकसित प्रक्रिया के आधार पर, सीएसआईआर-एनआईआईएसटी में BEC पायलट संयंत्र (क्षमता:

2000 लीटर) को डिजाइन और कमीशन किया गया। BEC प्रौद्योगिकी को ग्रीन H2 उत्पादन और अपशिष्ट जल के उपचार के लिए उन्नत टिकाऊ हरित तकनीक के रूप में उपयोग किया जाता है।

SEUF अधिकारियों के लिए स्वच्छता क्षमता निर्माण कार्यक्रम

सीएसआईआर-एनआईआईएसटी ने सामाजिक-आर्थिक इकाई फाउंडेशन (SEUF) के अधिकारियों के लिए एक क्षमता निर्माण कार्यक्रम आयोजित किया, जिसमें धूसर जल उपचार और ठोस अपशिष्ट प्रबंधन प्रौद्योगिकियों पर विशेष ध्यान दिया गया। इस प्रशिक्षण का उद्देश्य प्रतिभागियों के घरों के अपशिष्ट जल, विशेष रूप से स्नान, धोने और कपड़े धोने से उत्पन्न धूसर जल के प्रबंधन के साथ-साथ सतत ठोस अपशिष्ट प्रबंधन प्रथाओं को लागू करने में उनके ज्ञान और व्यावहारिक कौशल को बढ़ाना था।

कार्यक्रम में प्रमुख तकनीकों जैसे अवायवीय पाचन और कम्पोस्ट बनाने को शामिल किया गया, जिससे अधिकारी समुदाय स्तर पर प्रभावी अपशिष्ट उपचार को बढ़ावा देने के लिए आवश्यक तकनीकी ज्ञान से सुसज्जित हुए। उनकी क्षमता को मजबूत करके, यह पहल सतत जल उपयोग को समर्थन देती है, पर्यावरणीय प्रदूषण को कम करती है, और अपशिष्ट धाराओं से संसाधन पुनर्प्राप्ति को प्रोत्साहित करती है। यह प्रयास सुदृढ़ स्वच्छता प्रणालियों के निर्माण और समुदाय स्तर पर पर्यावरणीय जिम्मेदारी को बढ़ावा देने में योगदान देता है।



Awards & Recognitions

AWARDS



Dr. C. ANANDHARAMAKRISHNAN

Rashtriya Vigyan Shri Puraskar 2024
Tata Transformation Prize 2024



Dr. ANJINEYULU KOTHAKOTA

Fulbright-Nehru Academic and Professional Excellence Fellowship 2024
Prof. Gurcharan Singh Bains Award 2024



Dr. R. B. RAKHI

MRSI Medal 2024
Woman Achiever in Science 2025
(St. Theresas'College, Ernakulam, Kerala)



Dr. JUBI JOHN

Thieme Chemistry Journals Award – 2025



Dr. T. P. D. RAJAN

National Metallurgist Award 2023
(Ministry of Steel)



Dr. ACHU CHANDRAN

SERB-SIRE Fellowship (2024)
Best Published Paper Award (IIM)
Finalist (Manohar Parrikar Yuva Scientist Award; 2024)



Dr. SUBRATA DAS

Scientific High Level Visiting Fellowship (French Institute in India; IFI)



Ms. SANGEETHA MOHAN

Prof. Dr. A. Hisham Endowment Award in Phytochemistry-2024



Ms. AVIJA AJAYAKUMAR

SERB-Overseas Visiting Doctoral Fellowship

AWARDS

POSTER & ORAL PRESENTATIONS

Dr. Parijat Pallab Jana First prize for the oral presentation; International Conference on Science, Technology and Applications of Rare Earths (ICSTAR-2024), Thiruvananthapuram.

Ms. Riya Martin Best Poser Presentation Award; National Seminar on Neoteric Advances in Chemical Sciences (NACS 2024), Thiruvananthapuram.

Ms. Pavithra V. Prabhu Best paper award in Chemical Sciences; 37th Kerala Science Congress organized by KSCSTE, Thrissur.

Mr. Muhammad M. Best Poster Presentation Award: 78th Annual Technical Meeting of the Indian Institute of Metals (IIM ATM 2024), Bengaluru.

Dr. Simi V. S. Best Poster Presentation Award; International symposium on "Transformational Technologies in Materials and Manufacturing" and 78th Annual Technical Meeting of the Indian Institute of Metals (IIM-ATM 2024), Bengaluru.

Mr. Sumith S. Best Paper Presentation Award; the Research Scholars' Symposium on "Metals, Materials, and Manufacturing" organized by the Indian Institute of Metals (IIM) Trivandrum Chapter.

Ms. Mumthaz Salim Best Poster Award; 15th International IUPAC Conference on Polymer-Solvent Complexes and Intercalates (Polysolvat-15), Kolkata.

Ms. Akhila N. S. RSC Material Advances Best Poster Award; 15th International IUPAC Conference on Polymer-Solvent Complexes and Intercalates (POLYSOLVAT 15), Kolkata.

Ms. Devikrishna K. S. Best Oral Presentation Award; 23rd Prof. K.V. Thomas Endowment National Seminar on 'Frontiers in Materials Science'

Ms. Nandhana Sudhakaran Best Poster Award; APA-EPNOE-GFL International Conference 2024 on 'Polymers for Advanced Technology', Jaipur.

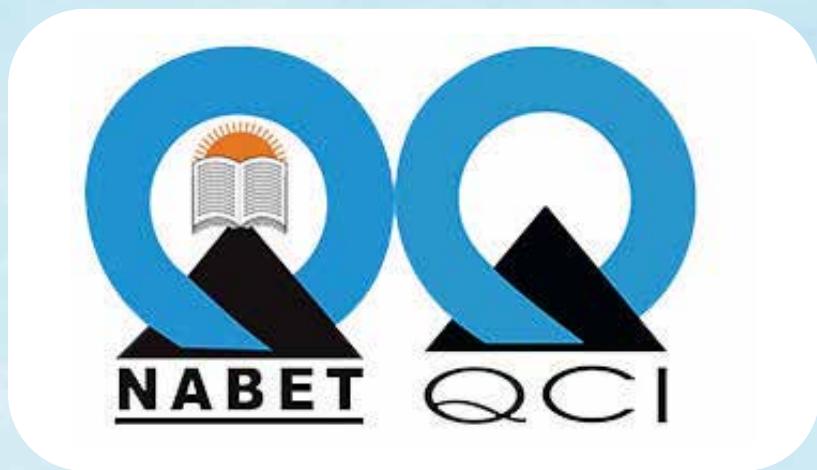
Ms. Anjana E. I. Poster Presentation Award; International Conference on Science, Technology, and Applications of RARE EARTHS (ICSTAR-2024), Thiruvananthapuram.

Ms. Anagha Ramesh M. Best Poster Award; National Conference on Recent Trends in Materials Science and Technology (NCMST-2024), Thiruvananthapuram.

National Accreditations

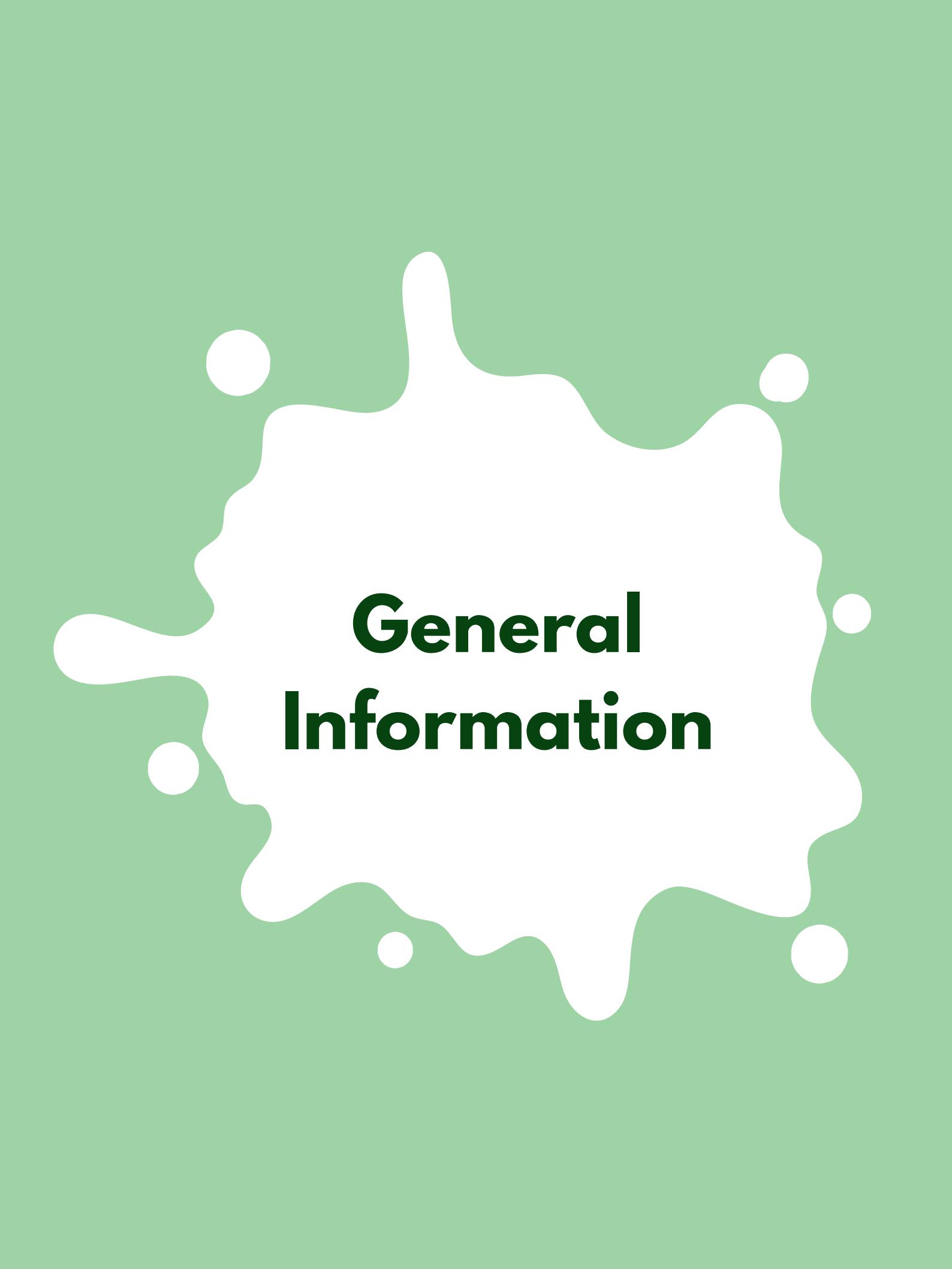


The ETD laboratory at CSIR-NIIST has been granted with EIC/FSSAI-NABL integrated accreditation for the testing of quality parameters as well as contaminants including Dioxin like POPs and heavy metals in various food, feed, water and environmental matrices. This major achievement reinforces the institute's national leadership in quality testing and regulatory compliance. CSIR-NIIST is the only NABL accredited laboratory in India for the measurement of odour in ambient air. The accredited facility has enabled revenue generation through sample analysis and created eligibility for Environmental Impact Assessment (EIA) projects, for which NABL accreditation is a prerequisite.



The Environmental Technology Division of CSIR-NIIST has been accredited with three new sectors by the Quality Council of India - National Accreditation Board for Education & Training (QCI-NABET) with the certificate no. NABET/EIA/24-27/RA 0333 dated June 12, 2024 valid through March 17, 2027. The current accredited sectors are

- i. Mining of minerals (open cast only)
- ii. Ports, harbours, dredging and break waters



General Information

Deputation

Sl. No.	Name	Present Designation	Place of visit
1	Dr. Vijayakumar C	Sr. Principal Scientist	Poland
2	Dr. K Madhavan Nampoothiri	Chief Scientist	Hungary
3	Dr. Binod P	Principal Scientist	Italy
4	Dr. C Anandharamakrishnan	Director	Indonesia
			Egypt
5	Dr. Adersh Asok	Senior Scientist	Germany, Austria & Switzerland
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