

Kyoto University On-site Laboratory: INitiative for INtelligent ChemBioInformatics (IN-CBI)

General Information

- ◆ Approved in FY 2024
- ◆ Establishment in October 2024
- ◆ Established by the Institute for Integrated Cell-Material Sciences (iCeMS), Kyoto University Institute for Advanced Study (KUIAS), and backed by the Institute for Chemical Research
- ◆ Partner Institution: Indian Institute of Technology Roorkee
- ◆ Location: (Cross-bound type)
Indian Institute of Technology Roorkee, Roorkee, Uttarakhand, India (outbound)
KUIAS, Kyoto, Japan (inbound)
- ◆ Purpose: Scripting an ecosystem to develop intelligent medical tools for age-related diseases
- ◆ Functions: Establishment of a hybrid (physical and virtual) platform between Kyoto University and premier Indian research institutions to efficiently identify and exchange outstanding students and early career researchers for education

Positive ripple effects to the university's activities

- Collaborate with India's top-tier engineering and medical institutions to co-develop innovative chemical biology tools at Kyoto University.
- Cultivate a new generation of scientists through the exchange of top students and researchers, empowering them to contribute to the global scientific community.
- Create an environment in which Kyoto University can become a "first destination" for Indian students.

Activity Overview

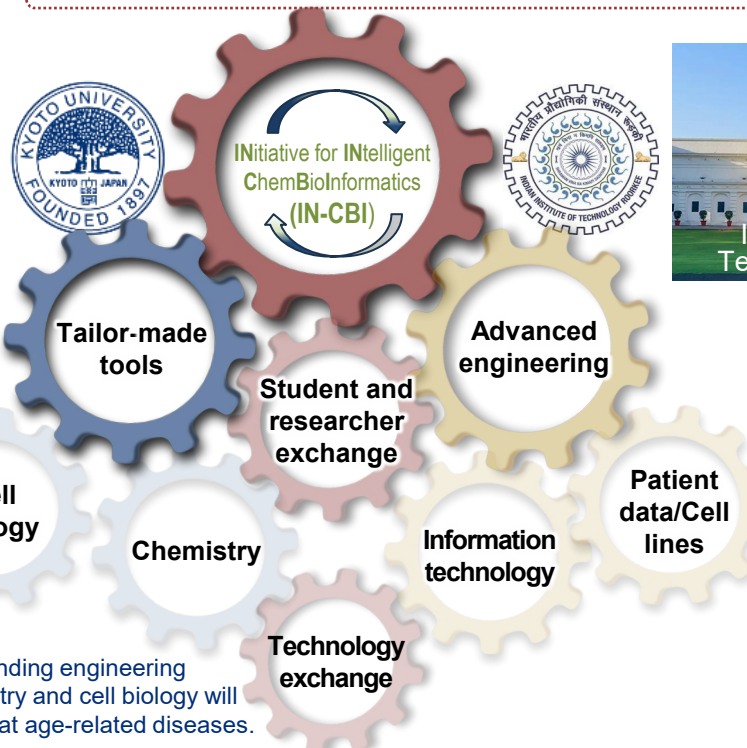
A hybrid (physical and virtual) cross-bound on-site laboratory for accelerating the development of intelligent (=programmable molecular design) chemical biology tools with the aim of advancing precision medicine

- Promoting research exchange and brain circulation as a hub between Kyoto University and the IIT network

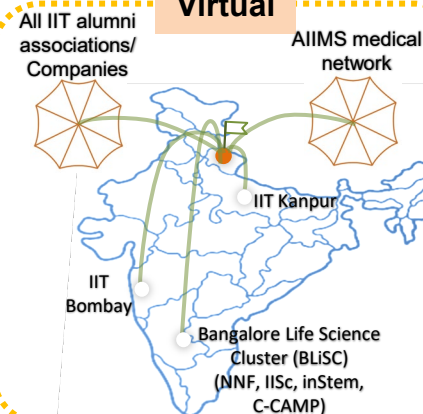


Physical

Provisional space by IIT Roorkee (3500 m²) and iCeMS (124 m²), cross-appointment of principal investigators, assignment of resident researchers by IIT and Kyoto University



Virtual



- ✓ Cross-border funding initiatives
- ✓ Sustainable mechanisms
- ✓ Network expansion
- ✓ Regional development contribution
- ✓ Engagement and outreach activities

- The synergistic effect of combining IIT Roorkee's outstanding engineering environment and Kyoto University's expertise in chemistry and cell biology will accelerate collaborative research to understand and treat age-related diseases.

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Main activities in FY 2025

1 Research Achievements

IN-CBI Head Namasivayam successfully fostered the joint research with IIT Roorkee Head Gopinath through joint supervision of three students. Together, they demonstrated that 1) carbon dot platforms enable mitochondrial regulation and oxidative stress control, 2) a mucoadhesive nanofiber patch achieves localized oral cancer therapy and 3) DNA origami pore for nucleobase detection in space biology. Three manuscripts are already published and their poster got first prize in Indian Government SPARC project.

2 Bridging Indo-Japan Collaboration and Young Researcher Exchange Programs

From Launch to scale: IN-CBI made steadfast progress to evolve as a ChemBioInformatics hub for aging research by building a sustained pipeline to enable high-quality early career researcher exchange through joint supervision, training, and outreach *via* strategic engagement with JST programs (LOTUS, Sakura Science) and KU-STAR.

Outreach lectures at IITs, embassy-led events, and national conferences significantly enhanced visibility and attracted top-tier candidates to Kyoto University.

Precision Analysis Center is being established at IIT Roorkee, supported by IIT alumni, industry-backed instrumentation, Tamil Nadu government engagement, a startup-oriented ecosystem, and future diaspora funding pathway.



Participants including JST President Hashimoto, at the "Gathering of Invited Young Indian Researchers in the LOTUS Programme" Embassy of India in Japan, Tokyo, July 28, 2025. Dr. Namasivayam and Mr. Kiran of the IIT Roorkee delivered invited talks as JST LOTUS host and student.



Gathering of Kyoto University Indian and International students at iCeMS for Diwali Festival and Symposium to advertise the scope and the activities of IN-CBI, October 22, 2025.



Dr. Namasivayam officially joined as 'Visiting Professor' at IIT Roorkee and a joint workshop with Prof. Subramaniam of the IIT Kanpur was held, January 2026.



Exchange students and researchers from IITs and Government getting Hands-on training at IN-CBI.



NNF Alumni Graduation at KU