

Minutes of the 2nd Meeting of the Research Advisory Committee (RAC) Meeting

Date: 26th May 2026

Time: 17:30-18:30 hrs IST

Mode: Hybrid Mode

Members Present:

S.N.	Name of Members	Designation	Membership
1	Rudra Pratap	Vice-Chancellor	Chairperson
2	Srikant Srinivasan	Professor & Dean of Academics	Member
3	Malini Balakrishnan	Professor & Director, Centre for Water Security (CWS)	Member
4	Vishal Garg	Professor & Director, Indorama Ventures Center for Clean Energy, Plaksha University	Member
5	Chaitanya Lekshmi Indira	Associate Professor & Director, Centre for Equitable and Personalized Healthcare (CEPH)	Member
6	Shashank Tamaskar	Associate Professor & Director, Centre for Sustainable and Precision Agriculture (CSPA)	Member
7	Ravi Jasuja	Director, Translational Research & Discovery, BWH, Harvard Medical School	Member
8	Anthony Watanabe	Chief Sustainability Officer, Indorama Ventures PCL	Member
9	Vijay Chandru	Professor & Co-founder and Chairman of Strand Life Science	Member
10	Chiranjib Bhattacharyya	Professor, Indian Institute of Science, Bangalore	Member
11	Venkat Padmanabhan	Managing Director, Microsoft Research India	Member
12	Sunita Chauhan	Professor & Dean of Research, Plaksha University	Member Secretary

Leave of Absence:

S.N.	Name of Members	Designation	Membership
1	Ravi Jasuja	Director, Translational Research & Discovery, BWH, Harvard Medical School	Member
2	Anthony Watanabe	Chief Sustainability Officer, Indorama Ventures PCL	Member

Opening Remarks of the Chairperson:

In his opening remarks, Vice Chancellor and Chairperson of the RAC, Prof. Rudra Pratap, welcomed the members to the meeting and outlined its objectives: to review the progress made by the research centers since the previous RAC meeting and to discuss future directions for thematic and translational research initiatives. He also noted that the University's research activities are primarily driven by four thematic research centers, along with individual faculty-led grants and projects.

Thereafter, the Chairperson requested the member secretary to proceed with agenda (Annexure-I).

The meeting commenced after getting confirmation that the quorum was complete.

Confirmation of minutes of the 1st meeting

The minutes of the 1st meeting of the Research Advisory Committee (RAC), held on 4th September 2025, were circulated to the members. As no comments were received, the RAC confirmed and approved the minutes. The minutes of the meeting are placed in Annexure no II.

Agenda Item#1: Updates on thematic high-impact research outputs from the four research Centers at Plaksha (IVCCE, CWS, CSPA, and CEPH).

Indorama Ventures Center for Clean Energy (IVCCE)

Prof. Vishal Garg presented updates from the Indorama Ventures Center for Clean Energy. He informed the committee that the center had refined its vision and mission statement, with the vision focused on "decarbonizing, democratizing, and digitizing energy for India and

beyond.” The mission emphasizes policy leadership, interdisciplinary research, partnerships, and entrepreneurship. The center’s research focus areas were presented as- urban microclimate, decarbonization of residential cooling and smart buildings and smart microgrids.

Key updates:

- Support provided for the Hyderabad Heat Action Plan and cool roof policy initiatives in Andhra Pradesh, in collaboration with NRDC and government agencies. Launch of a funded project to install cool roofs in 1000 low-income homes in Delhi.
- Strong student engagement with nearly 20 undergraduate students involved in clean energy research projects. The student team secured first prize at a national hackathon in Delhi.
- Organization of the flagship conference “Reimagining Buildings in Tri-City” on sustainable urban development.
- The Centre positioned itself as a “solutions lab for the energy transition,” focusing on policy engagement, startups, collaborations, talent development, and testbeds.

Discussion:

Prof Venkat Padmanabhan raised questions regarding long-term pathways to scale technologies and enable their deployment at the state and national levels. In response, **Prof. Garg** noted that the Centre aims to expand its impact through policy integration, startup incubation, and the development of training ecosystems.

Prof Vijay Chandru suggested exploring collaborations in AI-based heatwave forecasting and climate analytics. The discussions also addressed heatwave mitigation strategies and preventive policy interventions, including the adoption of cool roofs.

Center for Water Security (CWS)

Prof. Malini Balakrishnan presented updates from the Center for Water Security, highlighting its focus on developing sustainable and scalable solutions for urban water security through two core pillars: monitoring and treatment. Key initiatives included water quality monitoring, urban stream rejuvenation, autonomous monitoring vehicles, development of chromium and arsenic sensors, pathogen monitoring, robotic-enabled systems, membrane-based treatment technologies, solvent-resistant forward osmosis for pharmaceutical wastewater, and algal-bacterial sewage treatment systems. The Center identified urban stream rejuvenation as its primary strategic focus area.

Key updates:

- Creation of a centralized water quality data repository using scientific publications and LLM-based extraction methods. Mapping of a 70 km urban stream flowing from Chandigarh towards the River Ghaggar. Collaboration discussions with the University of Chicago.
- Use of geospatial visualization and physics-guided interpolation for predictive water quality analytics.
- Preparation of a position paper on AI-guided reservoir management in collaboration with IIT Gandhinagar and the AI Rescue startup. Case studies on dams in Gujarat, Maharashtra, and Punjab are supported by the ATE Chandra Foundation.

Discussion:

Prof Vijay Chandru discussed the potential to extend heavy-metal monitoring systems to applications in pathogen surveillance and wastewater monitoring. **Prof Malini Balakrishnan** emphasized the importance of pathogen monitoring in sewage-contaminated streams and elaborated on the use of wastewater surveillance for antimicrobial resistance studies. She also highlighted the development of tryptophan-based sensors for detecting signatures of microbial contamination.

Prof Venkat Padmanabhan appreciated the Center's work and recommended a clearer articulation of its positioning, core strengths, and measurable impact metrics, particularly in relation to data repositories and predictive analytics. **Prof Malini Balakrishnan** emphasized the need for robust pollution mapping, centralized datasets, and decentralized treatment solutions to strengthen intervention planning and improve urban water management.

Center for Sustainable and Precision Agriculture (CSPA)

Prof Shashank Tamaskar provided updates from the Agriculture Center, highlighting research focused on food security and sustainable agriculture.

Key updates:

- Development of low-cost sucrose sensors for sugarcane harvest optimization and farmer-oriented testing solutions, commercialization through the start-up 'Agmitra', deployment with sugar mills across Uttar Pradesh, Maharashtra and Punjab.
- Discussed work on soil carbon sequestration using fungal accelerants, AWD sensor systems for paddy cultivation, reduction of methane emissions and water use, and carbon credit-linked agricultural interventions.

- CSPA supports two student-led startups, including an agri-finance startup focused on agricultural price intelligence, and nearly 40 student researchers, along with international collaborations with Purdue University.
- Research publications at leading AI conferences, including AAAI, WACV, and CVPR, were also highlighted.

Discussion:

Prof. Vijay Chandru initiated discussions on biofuel generation from sugarcane. **Prof. Shashank Tamaskar** highlighted research opportunities in bioethanol production, including the development of sensors for fibre-content analysis in sugarcane. The discussion also covered strain optimization for converting agricultural waste into biofuels as well as biotechnology-based solutions to address Red-Rot disease, which causes significant annual yield losses in sugarcane crops.

Prof Venkat Padmanabhan raised the scalability challenges of ground-based sensors and suggested exploring remote sensing and satellite-based imaging approaches. **Prof. Shashank Tamaskar** highlighted the Centre's ongoing work in satellite and drone imagery, Agri Foundation Models, low-cost ground-truth sensors, and self-supervised learning for agricultural applications. He also noted collaborations with Purdue Research, CoreStack, IIT Delhi, and the Tessera initiative.

Center for Equitable and Personalized Healthcare (CEPH)

Prof Chaitanya Lekshmi Indira presented updates from CEPH, focusing on diagnostics and therapeutics for non-communicable diseases. The center's key research focus areas were presented as: vitro diagnostics, digital health and AI diagnostics, microfluidics and lab-on-chip systems, personalized medicine, multi-omics and radiomics integration, and disease biomarker sensing platforms.

Key updates:

- Highlighted progress on catecholamine sensing platforms for the early detection of cancers and neurodegenerative disorders, with long-term goals focused on combined dopamine, adrenaline, and noradrenaline detection.
- Support received through the Infra-chip program and a research collaboration in Ireland for the development of integrated sensing circuits was also discussed.
- Research into silicon fibroin-based biomaterials for wound healing, bone-on-chip, and liver-on-chip applications was highlighted.

- Under the digital health initiative, work on ethnic variation in breast cancer, using patient germline variant mapping and population landscape analysis was discussed.
- The team is also exploring sodium and potassium sensing technologies for diagnostic applications using blood and urine.

Agenda Item#2: Thematic Discussion on Cancer Research Programs

Discussion on Plaksha Oncology Research (POR)/ Consortium Grants

Prof. Sunita Chauhan presented the growing cancer burden in India, highlighting the sharp rise in cases, rising mortality, and the challenges of late-stage detection and the lack of nationwide screening programs. The discussion emphasized the need for a concerted, multidisciplinary approach that integrates diagnosis, therapy, surgery, and disease management through a multimodal, AI-based healthcare platform.

She then presented her Explainable AI (XAI)-based framework, patient-specific biomechanical digital twins, robotics-assisted ultrasound and biopsy workflows, and precision imaging approaches for structured, standardized data acquisition. She explained the proposed framework, developed in collaboration with Plaksha colleagues and external partners that involves the integration of the following:

- Comprehensive patient data from EMR/EHR and laboratory records
- Multi-modal medical imaging data such as X-rays, CT, MRI, mammograms, and ultrasound and radiomics based analyses
- Integrated multi-omics profiles such as genomics, proteomics, and metabolomics

The proposed framework aims to support:

- Early diagnosis (including mass screening)
- Personalized treatment and Therapeutic optimization
- Digital twins for diagnostics, therapeutics and surgical planning including robotics-assisted biopsy systems
- Clinical decision support systems (CDSS)
- Automated medical reporting, summarization and clinical documentation

Key highlights:

- National statistics showing an increasing cancer burden in India
- Special emphasis on breast cancer prevalence and late-stage detection in Punjab (as a representative case at the beginning and then exploring other cancer types such as lungs, liver, colorectal etc.)
- Development of multimodal AI-based healthcare platforms in integrating:

- Multi-Radiomics
- Explainable AI
- Multi-omics
- Digital twins
- Liquid Biopsy and clinical/lab data
- Experimental validation
- Multicenter studies and CDSS
- LLM/NLP pipelines
- Collaborative networks involving- IIT Delhi, IIT Jodhpur, Ashoka University, PGIMER Chandigarh, Homi Bhabha Cancer Research Hospital and Research Centre (TMC), Sir Ganga Ram Hospital, AIIMS Bathinda. Several industry collaborators such as MolBio Diagnostics and Prognosis Medical Systems; Himsoft Solutions, Trivitron Healthcare (P) Ltd etc. were also mentioned.

Prof Chauhan then presented a “One Health” consortium concept that she lead and developed with several Plaksha colleagues. The proposition integrates water security, precision agri-tech, human and animal health for symptomatic/asymptomatic early disease detection and treatment ecosystems. The proposal was submitted to Wadhvani Innovation Network (WIN) initiatives under a hub-and-spoke collaborative model.

Discussion:

Prof Vijay Chandru added that the increasing incidence of breast cancer among younger women may be associated with hereditary breast and ovarian cancer syndromes. He further suggested incorporating detailed family history and pedigree information into the clinical data collection process to strengthen hereditary risk assessment and patient profiling. **Prof Sunita Chauhan** added that triple-negative breast cancers are more prevalent among younger women and are comparatively more difficult to treat. The discussion emphasized the importance of testing not only the BRCA1 and BRCA2 genes, but also additional genes associated with hereditary breast and ovarian cancers. **Prof Vijay Chandru** referred to a published large-scale cohort study on hereditary breast and ovarian cancer in India and offered to share the reference study for further insights. All participants acknowledged the complexity of the overall workflow and agreed that further detailed discussions would be taken offline.

Prof Vijay Chandru sought clarification on the scope of the multi-omics measurements being used in the research framework. **Prof Sunita Chauhan** shared that the multi-omics work supports research on breast cancer, ALS, cardiovascular diseases, and diabetes, helping bridge clinical data and mechanistic studies. She explained that the multi-omics approach integrates genomics, transcriptomics, and proteomics to provide a

comprehensive, molecular-level understanding of diseases. **Prof Chiranjib Bhattacharyya** discussed ongoing work on X-ray analysis, explainability, and LLM-based medical imaging application. He highlighted challenges in AI-driven diagnostics where predictions from X-ray images remained accurate, but the generated explanations were sometimes unreliable. **Prof. Chauhan** further shared updates on AI-enabled portable X-ray systems for lung disease screening and broader infectious diseases monitoring applications from her previous work on COVID. **Prof Chiranjib Bhattacharyya** discussed the relevance of ageing- and longevity-related research, highlighting opportunities for collaboration in multi-omics, ovarian cancer, and healthy ageing studies, while emphasizing the challenges of integrating ageing research, disease understanding, and large-scale biological data analysis.

Prof. Vijay Chandru also referred to ongoing interest and support for longevity-focused initiatives and related research ecosystems. He shared that he chairs the data integration subcommittee under the National One Health Mission and suggested that Plaksha's One Health work could potentially be featured through the Mission's outreach platforms once the framework is further refined. He also offered to connect Prof Sunita Chauhan with Dr. Sangeeta Agarwal from the Office of the Principal Scientific Advisor for continued engagement on One Health initiatives.

Actionable Items:

Introducing Thematic RAC Meetings

Plan future RAC meetings around specific themes to foster focused collaboration along with impact metrics.

Closing Remarks:

The meeting concluded with appreciation from the RAC members for the progress made across centers, particularly in interdisciplinary research, student engagement, translational activities, startup development, and consortium-based initiatives. Members encouraged the teams to continue refining strategic focus areas and scaling impactful research outcomes.

The Chair confirmed that the quorum was maintained throughout the meeting. With no further items on the agenda, the meeting concluded, and the Chairperson thanked all members and expressed deep appreciation for their valuable contributions.



Annexure- I

Please find **agenda** of the Research Advisory Committee (RAC) of Plaksha University which is scheduled for **26th May 2026 (17:30-18:30 hrs. IST)**.

Time hrs. (IST)	Speaker	Agenda Item
17:30 – 17:40	Prof. Rudra Pratap, Vice Chancellor	<ul style="list-style-type: none"> Welcome Address and Opening Remarks Updates on research directions & new paradigms (e.g. through newly established School(s), Space Robotics program etc.)
17:40 – 17:55	Prof. Sunita Chauhan, Dean of Research, Chair	<ul style="list-style-type: none"> Updates on strategic plans and future directions: e.g. targeted cancer programs and other research initiatives. Strategic Research collaborations and highlights Updates on research statistics and OoR facilitation
17:55 – 18:15	Prof. Vishal Garg, Prof. Malini Balakrishnan, Prof. Shashank Tamaskar, Prof. Chaitanya Lekshmi Indira, Research Centre Directors	<ul style="list-style-type: none"> Updates on thematic high-impact research outputs from the research Centres (IVCCE, CWS, CSPA, and CEPH).
18:15 – 18:30	All Members	<ul style="list-style-type: none"> Committee Deliberations and Open Discussion – future directions
18:30	Vice Chancellor/Chair	<ul style="list-style-type: none"> Concluding Remarks



ANNEXURE-II

Minutes of Meeting: 1st Research Advisory Council Meeting

The 1st Meeting of the Research Advisory Council was held in online mode on September 04, 2025, at 17:30

S.N.	Name of Members	Designation	Membership
1	Rudra Pratap	Vice-Chancellor	Chairperson
2	Srikant Srinivasan	Professor & Dean of Academics	Member
3	Malini Balakrishnan	Professor & Director, Centre for Water Security (CWS)	Member
4	Chaitanya Lekshmi Indira	Associate Professor & Director, Centre for Equitable and Personalized Healthcare (CEPH)	Member
5	Vishal Garg	Professor & Director, Indorama Ventures Center for Clean Energy, Plaksha University	Member
6	Shashank Tamaskar	Associate Professor & Director, Centre for Sustainable and Precision Agriculture (CSPA)	Member
7	Ravi Jasuja	Director, Translational Research & Discovery, BWH, Harvard Medical School	Member
8	Anthony Watanabe	Chief Sustainability Officer, Indorama Ventures PCL	Member
9	Vijay Chandru	Professor & Co-founder and chairmen Strand Life science	Member
10	Chiranjib Bhattacharyya	Professor, Indian Institute of Science, Bangalore	Member
11	Venkat Padmanabhan	Managing Director, Microsoft Research India	Member
12	Sunita Chauhan	Professor & Dean of Research, Plaksha University	Member Secretary

Opening Remarks of the Chairperson:

Vice Chancellor **Professor Rudra Pratap** welcomed all members of the Research Advisory Council to the inaugural meeting of the Research Advisory Council at Plaksha University. The meeting focused on establishing a framework to guide the university's research agenda.

Professor Rudra Pratap opened the session with introductions from faculty members, including Prof. Sunita Chauhan, Prof. Malini Balakrishnan, Dr. Chaitanya Lekshmi Indira, Prof. Vishal Garg, Dr. Shashank Tamaskar, and Prof. Srikant Srinivasan, who shared their roles and research interests.

The discussions emphasized the university's commitment to tackling critical interdisciplinary challenges in areas such as **energy, water security, health, and agriculture**, with a strong focus on **translational research** to ensure that academic insights meaningfully address societal issues.

Prof. Rudra Pratap presented the vision for Plaksha University's research agenda, highlighting the importance of tackling interdisciplinary problems that can lead to societal impact. The university aims to

create research centers independent of teaching programs, concentrating on critical issues like energy, water security, health, and agriculture. Additionally, there will be a strong emphasis on translational research to convert basic research into practical applications and products.

Thereafter, the Chairperson requested the member secretary to proceed with the agenda.

The meeting commenced after confirmation that the quorum was complete. The agenda items were taken up for consideration and approval by the Research Advisory Council.

Agenda 1: Overview of Research Landscape and Facilities at Plaksha University

Prof. Sunita Chauhan, Dean of Research, detailed the initiatives of several research centers at Plaksha University, highlighting their focus on sustainable development. The Indorama Ventures Centre for Clean Energy emphasizes urban energy optimization, while the Centre for Equitable and Personalized Healthcare aim to improve accessibility and affordability in healthcare. Additionally, the Centre for Sustainable and Precision Agriculture utilize advanced technologies for crop management, and the Centre for Water Security addresses water treatment and monitoring.

Prof. Chauhan highlighted the Interdisciplinary and Transdisciplinary Approach as- Teaching and research are integrated at Plaksha. Undergraduate students are engaged in research from the beginning of their studies. Teaching programmes are interdisciplinary, while research goes beyond disciplinary boundaries to become transdisciplinary, addressing sustainable development goals with India-centric relevance. Prof. Sunita Chauhan highlighted the importance of balancing basic research with translational research, with an enabling ecosystem that fosters start-ups, industry collaborations, and technology transfer. The aim is to deliver India-centric solutions with global relevance.

Prof. Sunita presented an overview of the laboratories and facilities supporting the research Centres at Plaksha. The following were highlighted:

- **Clean Energy Lab:** This lab includes the smart buildings lab with a simulation studio for energy and daylight studies, facilities for testing cool roof materials, and systems for monitoring and optimising energy usage in buildings.
- **Dixon IoT Lab:** This lab is working on edge devices, networking, and advanced monitoring systems (such as multiple camera systems). This lab is equipped with testing and analysing instruments, along with manufacturing facilities including 3D printers and spectroscopy tools.
- **Water Facilities:** This lab consists of analytical equipment, and test units for FO (forward and reverse osmosis), supporting sustainable water monitoring and treatment initiatives.
- **MolBio In-Vitro Diagnostics Lab:** This lab consists of clean room for cell culture and molecular biology facility for cellular-level interventions and diagnostics.
- **Advanced analytical characterization facility:** This lab housed high end equipment for analysis and characterization and omics/multi-omics platforms for advanced health diagnostics.
- **Robotics Lab:** This lab addresses surface, underwater, and aerial robotics. Expertise includes aerial vehicles, farm/indoor rovers, humanoids, and underwater robotics systems.
- **Digital Twin Technology Lab:** It was highlighted that high-speed, large-memory, high-spec systems are available and are being used across multiple centres for advanced research requirements.

The details are placed in Annexure-I.

Agenda 2: Research Initiatives at Plaksha University

Prof. Sunita Chauhan detailed their funding strategies, highlighting both extramural and intramural grants, including support for startups and seed funding for labs. Prof. Sunita updated the members that research funding at Plaksha is being mobilised through multiple channels, including government and industry-sponsored extramural grants, CSR support, and consultancy-based intramural projects.

She added that almost all faculty receive start-up grants on joining, with additional seed support provided to labs and centres to establish facilities. She also highlighted active participation in proposals to external foundations such as the Bill & Melinda Gates Foundation, Wadhvani Innovation Network.

Research Funding and Outcomes

She also highlighted the proposal success ratio, i.e., 20.5%, and noted that more than 45 proposals are being submitted/ awaiting results. Additionally, she reported research outcomes, including 90 publications and various conference participations over the past three to four years.

Key Outcomes:

- 90+ publications, 15 book chapters, and 32 conference proceedings within 3 years.
- 45 proposals submitted (~₹102 Cr), with ₹21 Cr already approved (20.5% success rate).
- Research funding commitment: ₹62 Cr (₹29.45 Cr received).

Doctoral Research

Prof. Sunita Chauhan mentioned that the university currently has students across four specialized majors along with representation from Humanities (3) and other areas. A significant number of research students come from the Biosciences stream (about 12), with others in Robotics and Autonomous Systems (5), Data Science (2), and Computer Science (4) and Mathematics (2). She emphasized that this diverse cohort enables strong interdisciplinary and transdisciplinary outputs.

Prof. Sunita also mentioned that most research students are provided opportunities for fieldwork within India and are supported for international exposure, citing examples of placements at Erasmus University, Purdue University, Goethe Institute Frankfurt, and Duisburg in Germany.

UG Research

Prof. Sunita presented the Innovation Lab and Grand Challenges (ILGC) project as a unique signature initiative of Plaksha, distinguishing it from other universities in India. She explained that the program runs in two levels—ILGC 123 (first three semesters) and ILGC 456 (later semesters). In the initial three semesters, almost all students participate, working together on conceptual frameworks aligned with sustainable goals, before moving into more specialized individual or group projects in subsequent semesters.

She also shared notable achievements, including student participation and recognition at international hackathons and prestigious conferences such as Intellisys and MICAI. She further noted that some students have taken entrepreneurial paths, with two groups creating spin-offs and one venture (ThinkLude) already generating revenue. Additionally, she informed members that undergraduate students are actively engaged in research internships, with about 85 students participating in 2024 alone.

Collaborations

Prof. Sunita highlighted the strong collaborations established by Plaksha, both nationally and internationally. On the domestic side, partnerships include IIT Madras, IIT Bombay, IIIT Hyderabad, and several government institutions and foundations. Internationally, Plaksha has already forged MoUs with leading institutions such as Brigham and Women's Hospital (for an IVD project with the CEPH Centre), Cornell University, Purdue University, University of Pennsylvania, UC Berkeley, and most recently UCBM.

Thereafter, Prof. Chauhan requested **Dr. Roshan (Deputy Registrar – Research)** to present the vision, mission, and functions of the Office of Research. The Office is committed to enabling faculty to focus on advancing research by providing structured support.

Key Functions:

- Funding – Scoping, proposal development, submission, activation, award management, financial management till closure of the project.
- Research Infrastructure, lab operations, Certification.
- Procurement and infrastructure support.
- IP management and legal agreements with collaborators.
- Ethics and biosafety compliance committees.
- Science communication and visibility for research outputs.

The details are placed in Annexure-II.

Agenda 3: Overview of Research Centers at Plaksha University

Prof. Sunita Chauhan presented the overview of the Research Centers of the Plaksha University as follows:

1. Indorama Ventures Centre for Clean Energy by Prof. Vishal Garg

- Focus: Supporting India's transition to a net-zero carbon, self-reliant and energy-secure future.
- Key Areas: Urban microclimate modelling, decarbonizing night-time residential cooling, smart buildings and homes, smart microgrids.
- Infrastructure: Open testbeds for researchers, startups, and policymakers.

2. Centre for Water Security by Prof. Malini Balakrishnan

- Focus: Ensuring sustainable access to clean water with emphasis on urban ecosystems.
- Key Areas: Autonomous monitoring of water bodies, advanced sensor deployment, and resource-efficient treatment technologies.
- Ongoing Project: Rejuvenation of the Chandigarh–Ghaggar urban stream, integrating health impact studies.

3. Centre for Sustainable & Precision Agriculture by Prof. Shashank Tamaskar

- Focus: Affordable precision agriculture technologies and data-driven farming practices to improve farm yield and sustainability.
- Key Areas: Drone-based yield estimation, IoT-enabled soil and crop monitoring, biotechnology-based interventions.
- Achievements: Collaboration with sugar mills in UP, soil carbon sequestration projects, startup spin-off 'Agmitra', collaborations with Purdue and Italian institutes.

4. Centre for Equitable & Personalized Healthcare by **Prof. Chaitanya Lekshmi Indira**

- Focus: Development of diagnostic and therapeutic technologies for non-communicable diseases.
- Key Areas: Lab-on-chip devices, biosensors, wound-healing biomaterials, digital pathology with omics integration.
- Collaborations: MolBio Diagnostics, Bosch, partner hospitals, and biotech industries.

5. Dixon IoT Lab by **Prof. Srikant Srinivasan**

- Focus: IoT innovation for cross-domain applications (energy, water, agriculture, health).
- Key Areas: Edge computing, AQI monitoring, traffic management, high-frequency real-time data analysis.
- Support: CSR-funded by Dixon Technologies; active undergraduate student participation.

Discussions

Prof. Ravi Jasuja initiated the discussion by enquiring whether there exists a structured framework for faculty to be exposed to each other's expertise, or a regular forum for faculty interaction with a defined agenda rather than fluid or ad-hoc meetings.

In response, Prof. Rudra Pratap mentioned that research review meetings and Centre meetings already provide such platforms, and additionally, fortnightly informal sessions are organized where one faculty member presents their work for about twenty minutes. These sessions are intended to generate engagement and foster collaboration by allowing colleagues to explore how their expertise could be applied to each other's research.

Prof. Vijay Chandru emphasized the importance of strengthening industry-academia collaboration. He suggested exploring models where industry partners directly sponsor joint faculty appointments with structured collaborative programs directed towards commercialized outcomes, as research often risks being misaligned with actual industry needs.

Responding to this, **Prof. Rudra Pratap** affirmed that Plaksha is open to such initiatives and recalled that the University had previously explored a joint appointment with Google in 2021, which could not materialize due to logistical reasons. He further informed the committee that one company has already committed to such a model, and the University is keen to expand this approach with more industry partners.

Adding to the discussion, **Prof. Sunita Chauhan** highlighted the potential of engaging "Professors of Practice" with prior industry experience to bridge academic and industry ecosystems, while also stressing the need to carefully balance academic freedom with industry collaboration. Building on this, Prof. Vijay Chandru reiterated the idea of structured industry-academic faculty appointments and shared the MIT UROP model for undergraduate research as a potential reference.

Prof. Venkat Padmanabhan advised cautious engagement with industry, pointing out the risks of over-dependence. He underlined the importance of "use-inspired basic research" and developing a collaborative team culture as guiding principles. He cautioned against over-indexing in industry, emphasizing that Plaksha should retain the license to create knowledge independently. He noted that the Plaksha research overview is impressive and raised questions on the rationale behind the four focus areas—whether they were chosen for maximum impact, faculty interests, or competitive advantage through existing partners such as hospitals.

Prof. Venkat Padmanabhan also cited UC Berkeley's culture of developing tools like the Spark big data system, which shaped the industry. Using Apache Spark as an example, he noted it addressed genuine needs for high-speed, cost-effective data processing and evolved into Databricks. He highlighted that academic success often becomes personalized, limiting collaboration, and asked how Plaksha is building a culture that enables multiple people to work together, share credit, and tackle large, challenging problems collectively. He emphasized focusing on research and solutions addressing real-world problems rather than explorative searches with limited practical value, underscoring the importance of solving practical problems with original solutions rather than merely adapting existing ones.

On how the Centres were chosen, **Prof. Rudra Pratap** explained that Plaksha had an Academic Advisory Board in existence even before the university started operations in 2021, with many leaders involved. When the founders planned the university, they deliberated on areas important for India. While these four Centres are important globally, these problems were chosen after careful consideration.

On the concern of over-indexing on industry, Prof. Rudra Pratap said this is a continuous focus, and advice from colleagues has been never to lose sight of fundamental research. He noted that securing funding for fundamental research in India is becoming difficult, as agencies like DST, DBT, and MeitY increasingly require demonstrable outputs. He added that while Plaksha must protect fundamental research, the gap in translating discoveries into useful applications is also significant, and the university is deliberately working to balance both, even without a magic formula.

Prof. Rudra Pratap also said that fostering a collaborative research culture is important. He noted that traditionally, research recognition has been individual-focused, but large groups can work together without being afraid of getting drowned. He emphasized that even in big projects, there is room for individuality, and what is accomplished together is much more than the sum of its parts. He added that currently, there is no existential threat to this approach, and people are continuously thinking about coming together.

Prof. Vijay Chandru emphasized that the goal can be to aim for the “user-inspired” basic research. He highlighted two key points. First, on undergraduates getting into research, he shared the MIT model through the Undergraduate Research Opportunities Programme. By the end of the freshman year, every undergraduate finds a mentor and is encouraged to explore research during that year. Students then continue with their mentor through their undergraduate studies, allowing them to do substantive work and integrate research into their academic training. He noted this approach works very routinely at MIT.

Second, Prof. Vijay Chandru also spoke about the importance of the office of research. Drawing from his experience at Purdue, he described how each department in the School of Engineering had its own “business office” to identify proposal opportunities, profile faculty, and connect with funding agencies like NSF or defence research organizations. The office helped faculty sketch proposals, manage budgets, submit applications, and follow up, which allowed faculty to generate funding (around \$200,000 per year in the 1980s) to run small labs.

Prof. Rudra Pratap stated that he took the lead in setting up the Office of Research at Plaksha. Drawing from his experience as Deputy Director at IISc, he established the office in 2019, even with just 9–10 faculty members in the first year. He emphasized the importance of having this support structure for faculty, and now the office is doing providing an extraordinary role and has grown to 3–4 people working to provide that support.

Prof. Ravi Jasuja expressed concern about students wanting to become entrepreneurs in their first or second year, emphasizing the “I have a startup day” bandwagon. He highlighted that the real differentiator of any startup is innovation, which cannot be achieved in six months. Faculty must serve as exemplary models, demonstrating perseverance and that genuine science leads to innovation. Referring to the Spark example, he noted it did not start as a company. He stressed that role models should be faculty who have persevered for decades—such as studying one enzyme mechanism that may lead to a new antifungal—rather than dropouts replicating existing platforms like Amazon. He added that this spirit of perseverance and dedication to innovation is crucial and should be exemplified in faculty culture, reminding faculty of this principle in every meeting.

Prof. Chiranjib Bhattacharya described this research meeting as a magnificent step in learning and expressed his intent to see it succeed. His first question was on measuring metrics—how research success should be evaluated. He noted that while end-of-five-year success is clear, intermediate successes are hard to measure, and publications are a poor metric, though TRL levels 1–3 may help. His second question concerned startups, cautioning against early-stage ventures like ‘Chai Point’ and emphasizing focus on deep-tech startups. He asked whether the next generation is being mentored toward innovation and deep tech, acknowledging the challenge. He suggested leveraging Plaksha’s advantage of mentorship by CEOs and founders, proposing a conference to deliberate on 21st-century challenges that mentors would invest in, feeding into meaningful research. He also highlighted his interest in data and computing, noting its absence in discussions and potential to attract global attention, and asked whether anyone from Plaksha is applying for grants like the Sony Grant.

Prof. Rudra Pratap highlighted that the upcoming Binny Bansal School of AI will focus significantly on data and computing, with participants hearing extensively on these topics. He mentioned that the Office of Research continuously circulates, and filters grant opportunities, which are then shared with faculty to support their research initiatives. It was noted that professors from Plaksha have applied for grants, including the Sony Grant, but were unable to clear the first round of the selection process.

Prof. Vijay Chandru noted that agriculture has become a focus largely due to the location in Punjab. On the health side, he highlighted that Punjab is the cancer capital of India, with a high prevalence of liquid cancers, likely linked to carcinogens used in farming. He suggested that the molecular biology group could focus on this area, especially as immunotherapies are showing promising results for liquid cancers. Regarding the MolBio Lab, he inquired whether the work involves only microfluidics or also incorporates a digital layer for control and optical scanning. He explained that combining microfluidics with digital control and optical scanning constitutes Electro-wetting, emphasizing the importance of integrating both layers for advanced applications.

Dr. Chaitanya responded that currently, the lab is focused on microfluidics and is at an early stage. They are optimizing optical and electrochemical platforms separately and developing channels for very small fluid flows. While these avenues are being explored to enable next-generation measurements, the team is still in the platform development stage and has not yet integrated these methods. She confirmed that they may investigate using very thin layers for detection in future work. Prof. Sunita Chauhan mentioned that a comprehensive proposal on oncological research has been written and is currently shared with the Institutional Advancement team. She noted that while forming collaborative groups with Tata Memorial, the program covers both solid carcinomas as well as liquid cancers.

Prof. Vijay Chandru advised that Plaksha should really look at Schmidt, Futures and Schmidt Sciences. He noted that Schmidt’s philanthropy and Schmidt Sciences, fund a lot of university-driven projects and so on. He added that it’s a very impressive cohort of mentors and so on that come in, because of Schmidt himself. Prof. Vijay Chandru added that within India, the Zero guys are very interested. He mentioned that Rainmatter, Rainmatter Foundation, and Rainmatter Investments are very focused on sustainability again.

Dr. Anthony Watanabe proposed that future RAC meetings should be more focused on collaboration and thematic dialogues. He also suggested including circular economic research as one of the themes for future deliberations.

Prof. Rudra Pratap thanked everyone for their suggestions and time.

Closing Remarks

Prof. Rudra Pratap thanked RAC members for their valuable input. He acknowledged the importance of balancing fundamental and translational research, while strengthening industry, government, and international collaborations. Consensus was reached to conduct the next RAC meeting with extended time for thematic deep-dives and collaborative discussions.

Actionable Items

- **Launch Targeted Cancer Research Programs**
Develop focused research initiatives on liquid cancers prevalent in Punjab, integrating molecular biology, immunotherapy, and environmental studies.
- **Introduce Thematic RAC Meetings**
Plan future RAC meetings around specific themes (e.g., circular economy, deep tech, cancer research) to foster focused collaboration along with impact metrics.



Prof. Sunita Chauhan
Member Secretary, Research Advisory Council
& Dean of Research, Plaksha University

