

The Translational Research Playbook

A compendium of models and enablers of translational research as identified from leading Indian S&T institutions



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of translational research as identified from
leading Indian S&T institutions

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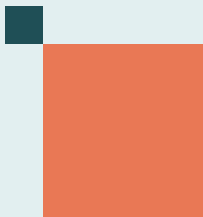
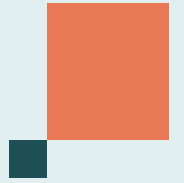
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About FAST India

Foundation for Advancing Science and Technology (FAST India) is a non-profit institution of excellence dedicated to building capacity and advancing policy solutions that foster scientific enquiry and research, and facilitate the creation, dissemination, and translation of new scientific knowledge. FAST's mission is to catalyze India's ascent to become a top three S&T nation.

FAST India has four key verticals - Government, Institutions, Industry, and Science Communication. Ashish Dhawan (Founder, The Convergence Foundation) and Varun Aggarwal (Founder, Aspiring Minds and The Change Engine) are the key promoters of FAST. Our Board of Advisors includes distinguished S&T luminaries such as Prof. Tarun Khanna (Jorge Paulo Lemann Professor at Harvard Business School), Prof. K. Vijay Raghavan (Former Principal Scientific Adviser), and Dr. Soumya Swaminathan (Former Chief Scientist at WHO), who are committed to guiding our mission.



Foreword

Science and technology in India have always thrived on the ingenuity and resilience of our researchers, entrepreneurs, and institutions. Yet, for too long, the pathways from laboratory discovery to societal impact have been fragmented and uncertain. Translational research—where ideas are not only generated but also deployed for the public good—has become essential for nations that aspire to have both economic growth and societal well-being.

This playbook on translational research at India's leading S&T institutions is a timely and important effort. It brings together lessons from diverse contexts, offering insights into how universities and research centres can reimagine their role—not just as knowledge creators, but as catalysts of innovation, enterprise, and impact. By capturing pioneering initiatives, institutional practices, and enabling mechanisms, this compendium highlights the remarkable progress already underway across India.

The story of science is never linear. It is shaped by serendipity, by questions that wander off the expected path, and by people who see connections where others see boundaries. Translational research flourishes in such an environment—not through rigid plans alone, but through cultures that encourage curiosity, leadership that embraces risk, and institutions that allow chance discoveries to find their way to the world. Having been closely involved with most of the institutions covered

in this report, at some point of time during my career, I can say that they have succeeded through a combination of design and accident but one thing that is common across all of them is that they dared to take the first step.

The task before us is to make translational research not an exception, but the norm. Doing so requires nurturing cultures that value risk-taking, building institutional structures that enable partnerships with industry and society, and ensuring that policy and funding frameworks reward outcomes beyond academic metrics alone. Above all, it requires empowering our young researchers and entrepreneurs to see their work as part of a larger mission: advancing knowledge while serving humanity.

I hope this work will inspire institutions, policymakers, and innovators to deepen their commitment to research translation. The stories and practices showcased here remind us that when science meets society, the results can be transformative—not only for India, but for the world.

K VijayRaghavan

Former Principal Scientific Adviser
to the Government of India

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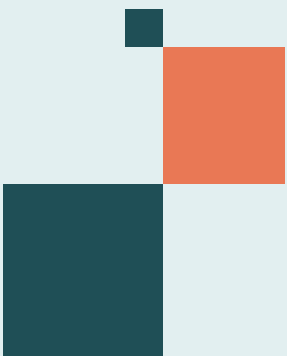
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About the Study

This study intends to capture innovative interventions in research translation at leading Indian S&T institutions. It brings together pioneering initiatives as well as core enablers that work across different actors in a university ecosystem, with the objective to enhance research outcomes in the form of industry deployments, startups, patents, licensing etc. We hope this compendium of success stories of institutions will help catalyze India's research translation efforts.

FAST India believes there is a need to identify and study best practices from successes in Indian Institutions and create public goods in the form of case studies for utilization by the ecosystem of Indian educational and research institutions. While success models in the West and even in our rapidly growing Asian neighbours are well researched, we need to enrich this understanding with Indian examples.

Who this report is for:

- For institute Directors, Deans of R&D and R&D offices to learn about models and programs that they could build at their own institute to enhance research translation.

- For S&T policy makers and students to be up-to-date with the efforts towards research translation in India.
- For researchers to learn about relevant programs that they could apply to.
- For industry leaders to learn about possible pathways to collaborate with and boost targeted research with high quality deep science and technology institutes.

S&T Institutions covered (scope of the report):

- **Top 4 National Institute Ranking Framework (NIRF) Institutions (Overall and Research Category)**
IISc Bangalore, IIT Madras, IIT Delhi and IIT Bombay.
- **Technology Incubators of research institutes**
CCAMP/NCBS and Venture Centre/NCL Pune.
- **Private and Public Private Partnership (PPP) institutions**
BITS Pilani and IIIT Hyderabad.



Note:

Our study is currently limited to the above eight Indian S&T institutions and their initiatives. While there might be other institutions that have similar interventions or their own set of unique models, they are currently not part of the scope of this report. FAST India may release another report in the future that covers other such institutions.

Methodology

Shortlisting Institutions

We shortlisted the institutions using a mix of criteria including NIRF rankings (research), presence of translational research initiatives and recommendations from sector experts.

Ensuring Diversity

While selecting the institutions, we ensured representation across:

- **Ownership:**
Public and Private Institutions
- **Type:**
Engineering and Pure Research Institutions
- **Geography:**
Across India

Data Collection

Qualitative insights from multiple in-depth consultations from faculty and heads of specific initiatives at the selected research institutions.

Quantitative parameters using publicly available data in their annual reports and website. For the parameters that were not publicly available, we sourced the information directly from our point of contact at the institution.



Executive Summary

India's journey towards becoming a global leader in science and technology hinges on its ability to translate cutting-edge academic research into impactful real-world applications.

This report, developed by FAST India, explores how leading Indian S&T institutions are pioneering this effort through innovative translational research initiatives.

It captures both differentiated practices and foundational enablers that together build effective research-to-market ecosystems.

The study offers a diverse range of approaches and strategies by covering top-ranking:

- **Public institutions:**
IISc Bangalore, IIT Madras, IIT Delhi, IIT Bombay
- **Premier incubators:**
C-CAMP, Venture Center
- **Private institutions:**
BITS Pilani, IIIT Hyderabad

Key findings

01

Institutions are going beyond traditional academic models

Translational research ecosystems are being strengthened through a mix of bold, outcome-oriented programs and targeted policies. These include:

- PhD programs for research commercialization: PhD DRIVE and IMPACT program at BITS Pilani
- Faculty entrepreneurship models: Project Titanium at IIT Bombay and Lab2Mkt at Venture Center
- Long-term industry collaborations: FSID at IISc Bangalore and Credit Point System at IIT Madras Research Park
- Dedicated teams of scientists and engineers for translation: Discovery Innovation Accelerator at C-CAMP and Product Labs at IIIT Hyderabad

02

Establishing dedicated translational structures

Impact is higher when dedicated and autonomous structures focused on translation or industry-academia collaboration are set up. Unlike traditional academic departments or centralized R&D offices, these specialized entities—such as translational research centers, Product Labs, or Centres of Excellence—operate with greater flexibility, responsiveness, and mission alignment.

03

Collaborative models with industry

These are being institutionalized through long-term partnerships, co-location of R&D labs, and credit point systems (e.g., IIT Madras Research Park) that mandate and reward research engagement.



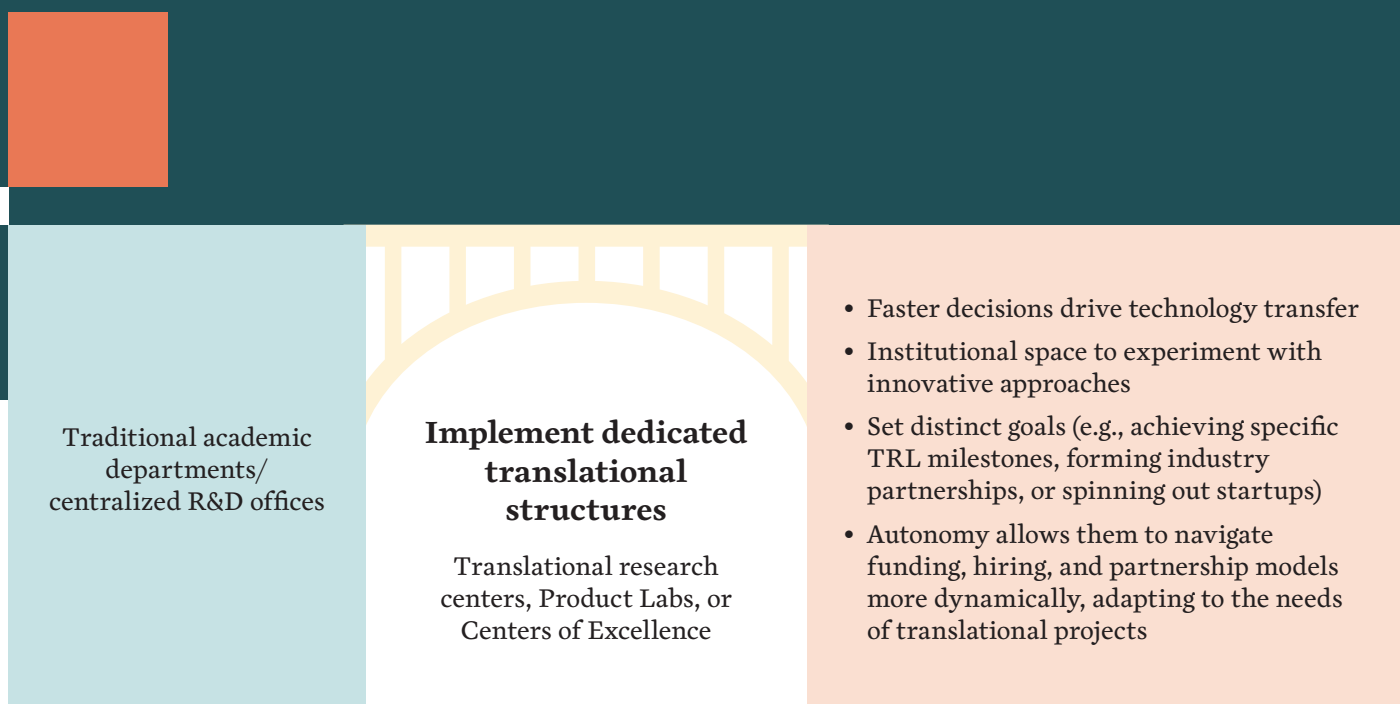


Figure 1:
Dedicated translational structures bridge the gap between research and commercialization

04

Getting the basics right through foundational infrastructure

Technology Transfer Offices (TTOs), incubators, and IP Cells have emerged as critical pillars for any institution serious about building its translational capacity. These entities help bridge the gap between academic output and commercial adoption through licensing, startup formation, and strategic industry linkages.

05

Institutional leadership and culture is the key differentiator

While infrastructure and funding are essential, it is visionary leadership and an enabling institutional culture that ultimately determine the success of translational research. Institutions that foster a mindset of innovation, risk-taking, and entrepreneurship—led by directors, deans, and faculty champions—are far more likely to translate research into real-world impact.

06

Challenges remain

Particularly around industry confidence, funding gaps for deep-tech ventures, absence of contract manufacturing, and a lack of commercialization expertise within academic ecosystems. Addressing these bottlenecks will require coordinated policy efforts and continued ecosystem capacity building.

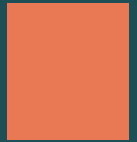
Based on this study, FAST India recommends the following for enhancing translational research at institutions:

- 1. Pair Basic Science and Translation Institutions**
Enable partnerships between basic science institutes and commercialization-focused entities (e.g., NCL-Venture Center, NCBS-C-CAMP) with clear inter-institutional tech transfer policies.
- 2. Establish Dedicated Translation Teams**
Create teams of translation scientists and industry liaison officers to bridge TRL 4–9 gaps and facilitate industry-oriented R&D.
- 3. Ensure Transparent Reporting of Translation Outcomes**
Mandate public reporting of disaggregated data on industry partnerships, spin-offs, faculty entrepreneurship, and commercial revenue. Institutions can only improve what they are measuring.
- 4. Enable Researcher and Business Co-founder Pairing**
Facilitate structured team formation for deep-tech startups by matching researchers with entrepreneurial co-founders (e.g., Project Titanium at IIT Bombay).
- 5. Develop Domain-Specific Clusters**
Anchor regional clusters around institutional strengths (e.g., Bengaluru Life Science Cluster) to catalyze academia-industry synergy.
- 6. Establish Contract Manufacturing Facilities for Scale-Up**
Shared CMFs can bridge critical infrastructure gaps for institutions and SMEs, enabling faster product prototyping, reducing risk, and accelerating the path from research to market.
- 7. Institutionalize Long-Term Translation Strategy**
Define and align a sustained vision for translation outcomes beyond leadership tenures, tying it to incentives for HoDs and Deans.
- 8. Offer Training and Mentorship for Faculty and Researchers**
Provide structured support to faculty and researchers for navigating the commercialization journey and TRL transitions.
- 9. Design Targeted Faculty Incentives**
Institute targeted and specific incentives for faculty that encourage commercialization.
- 10. Introduce Faculty Tracks for Research, Teaching, or Entrepreneurship**
Adopt differentiated career tracks (e.g., BITS Pilani model) that align with individual faculty interests and institutional goals.

India's translational research story is still unfolding. But the initiatives highlighted here point toward a promising shift—from publications to patents, from research to real-world relevance, and from academic excellence to national impact.

Understanding Translational Research





From Lab to Market: The Case for Translational Research

Translational research involves turning basic research knowledge and innovations into real-world application. While these applications may benefit human health and society as a whole, it is not considered a necessity as a part of our study. The term originates from the life sciences and biotechnology, but is not confined to those disciplines.

The importance of converting research into real-world products and applications that lower cost, improve productivity, and solve existing societal problems cannot be overstated. The creation of new products and services can be greatly accelerated by matching research goals with market demands. This would then result in deep-tech and deep-science entrepreneurship and economic development by creating new jobs and industries, and improving growth and productivity (Murdock and Stephenson 3).

However, there are still many challenges in this process, and most of the academic research and innovation done at research institutions never ends up reaching the market. A FAST India study on India's State of Science found that when compared to the US and China, India fares better in institutional ranking and publications as compared to translational indicators. For example, India's high-tech exports as a % of total trade is 4.4%, compared to 9.4% of the US (a 2.1x difference), and 32.4% (a 7.4x difference) of China. Additionally, the number of unicorn startups in India is 68, compared to 625 in the US (a 9.2x difference), and 312 in China (a 4.6x difference). Encouragingly, the government has begun taking steps to foster research translation—an important foundation on which a stronger innovation ecosystem can be built.



Figure 2:
High-tech exports as a % of total trade for India, China, and the US

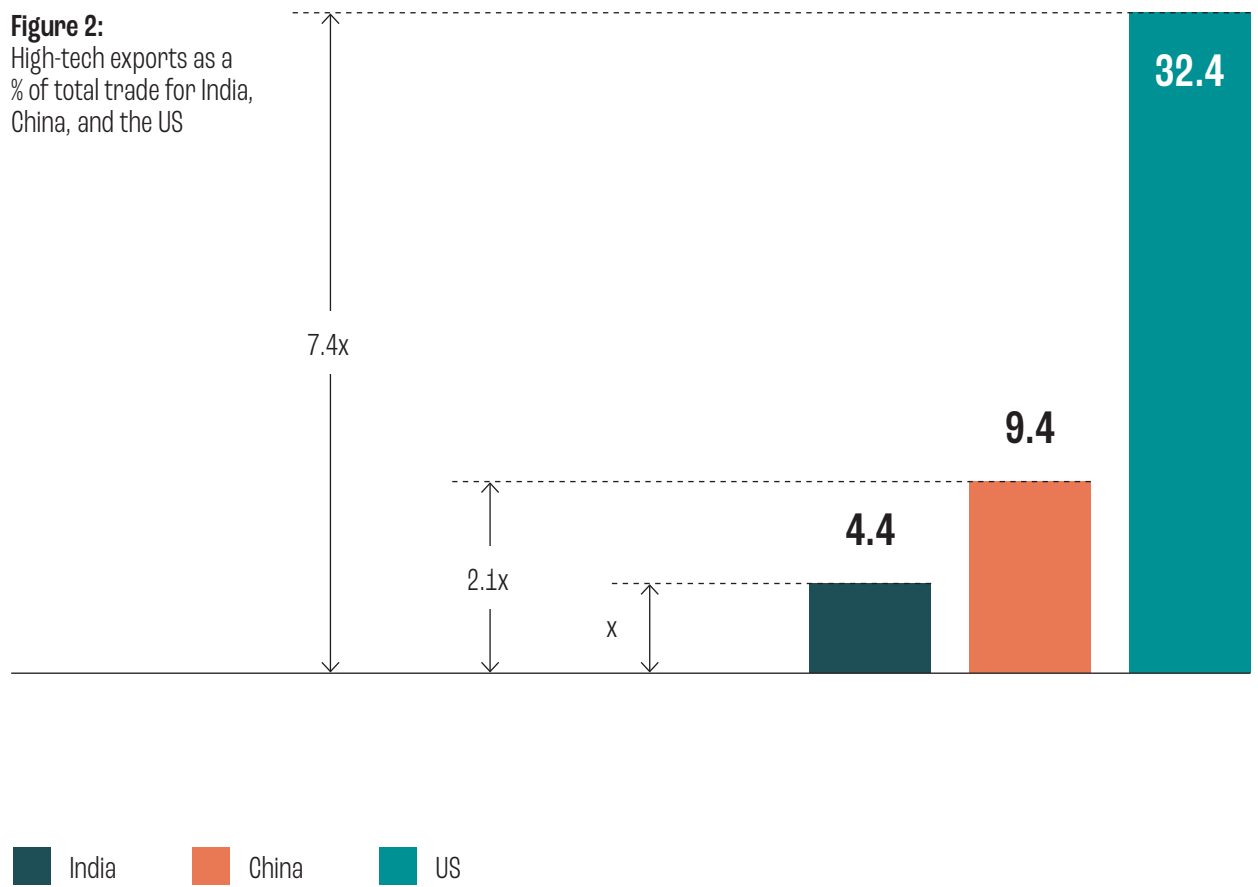
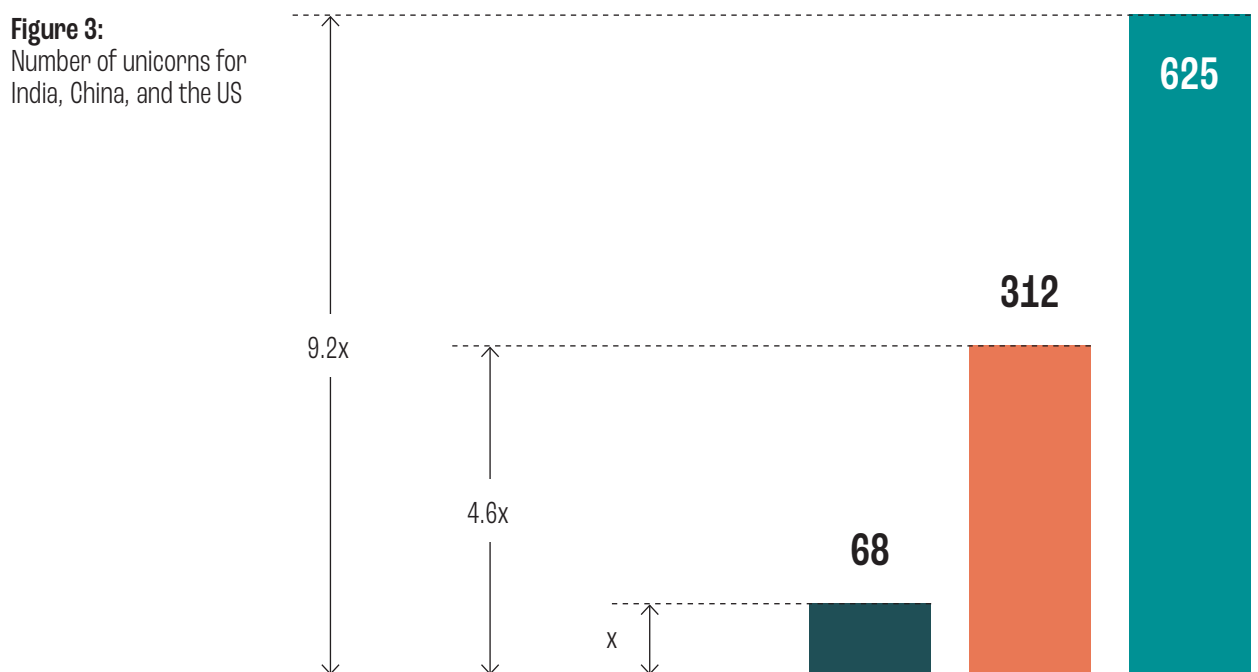


Figure 3:
Number of unicorns for India, China, and the US



Government Initiatives

In India, the government programs aimed towards translation are majorly in biotechnology and the life sciences. For example, the Translational Health Science and Technology institute was set up by the Department of Biotechnology (DBT) in 2010 - an autonomous institute for translational research in the health sciences. Similarly, the Indian Council of Medical Research (ICMR) has an Innovation & Translation Research Cell dedicated to identifying translational leads and from academic research and facilitating their translation from laboratory to clinical applications. Another initiative of the DBT was the setting up of the Centre for Cellular and Molecular Platforms (C-CAMP), a centre conceptualized with the mandate of enabling and catalyzing research and innovation in the life sciences.

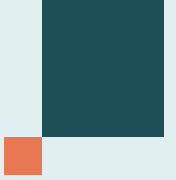
The Office of the Principal Scientific Adviser (OPSA) has also set up Science & Technology (S&T) Clusters in various cities, which play a role in facilitating industry-academia collaboration. These clusters aim to create strong linkages between academic institutions, national and state research laboratories, as well as industry, start-ups, MSMEs, etc. Currently, there are eight S&T knowledge clusters active across India (listed below) that aim to bring together academia, R&D institutions, and industry to solve challenging problems of their respective regions.

- Andhra Pradesh Medtech Zone (AMTZ Vizag)
- Bengaluru Science and Technology Cluster (BeST)
- Bhubaneswar City Knowledge and Innovation Cluster (BCKIC)
- Delhi Research Implementation and Innovation Cluster (DRIIV)

- Jodhpur City Knowledge and Innovation Cluster (JCKIC)
- Panjab University - IIT Ropar Regional Accelerator for Holistic Innovations (PI-RAHI)
- Pune Knowledge Cluster (PKC)
- Research and Innovation Circle of Hyderabad (RICH)

The strong push towards entrepreneurship by the government has resulted in rapid startup growth in India through initiatives such as Startup India, Digital India, Atal Innovation Mission, and the National Innovation and Startup Policy (NISIP). Currently, there are over 150,000 registered startups and over 100 unicorns. There has also been a rapid growth of startup incubators, with more than 1,100 incubators in the country as of 2024 (Jha and Rajan 3). Incubators play a crucial role in research translation - by providing resources, mentorship, and networking opportunities to early-stage deep-tech and deep-science ventures.

With increasing government support for research and development (R&D) in India—through initiatives such as the Science, Technology and Innovation Policy (STIP), the Anusandhan National Research Foundation (ANRF), and the Research Development and Innovation Fund (RDIF)—there is a timely opportunity for academic and research institutions to learn from each other and strengthen their efforts to translate research into market-ready products. By equipping researchers with the necessary resources and support systems, institutions can play a key role in driving innovation-led economic growth for the country.



The Research Translation Process

Research translation at an academic institution is a complex and hard problem. It requires multiple teams and stakeholders working together to create a conducive environment that allows translation to take place. First, there needs to be a long-term vision and strategy from the leadership of the institution. Translation needs to be made a priority, and there should be a strong willingness to create opportunities and eliminate roadblocks.

Next, programs need to be designed that allow researchers to conduct their research with an aim towards commercialization. Once the research has been conducted, pathways need to be developed for the translation of the research to take place.

This can be through a dedicated team of translation scientists which build on the research done, an expert team of tech transfer professionals who guide the researchers on the most appropriate pathway for commercialization, or incubators which encourage researchers to convert their research into a deep-tech or deep-science startup.

Post this, there needs to be support from an administrative body which handles the post-deal management - supporting the industry partner in implementing the technology for their specific use case, ensuring that royalties and licensing fees are collected timely, and supporting the startup with mentorship and industry and funding connections. The revenues earned through the commercialization support provided should then be reinvested for future commercial development activities.

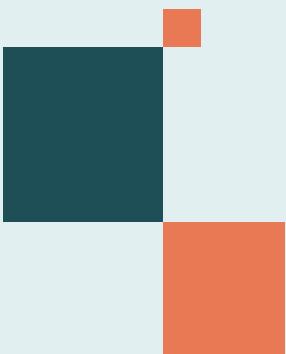


Figure 4:
The research translation process in academic
and research institutions

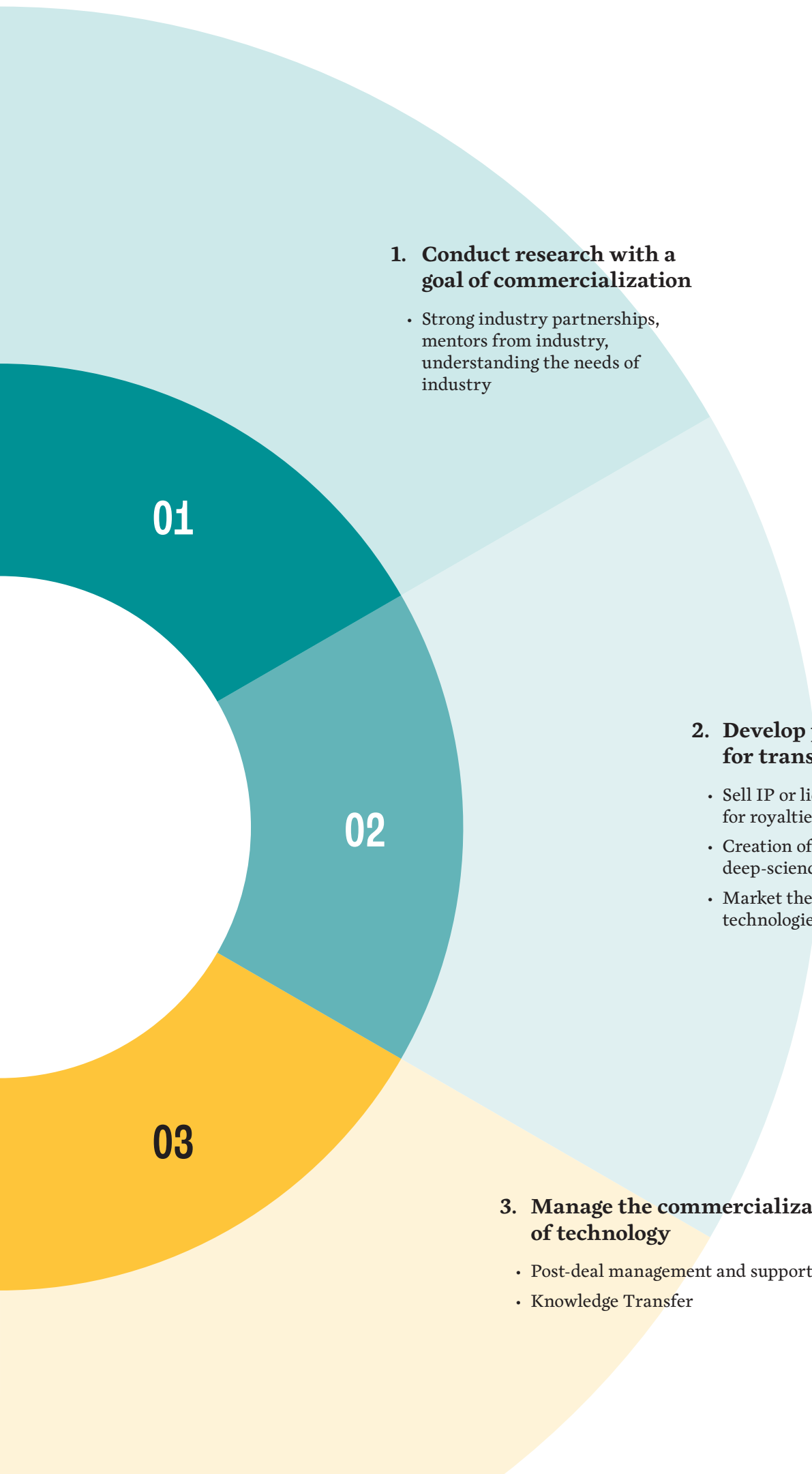


5. Strategize and create a vision for translation

- Create a culture that encourages risk and asking for support
- Design programs and policies aimed towards commercialization of research

4. Reinvest revenues

- Reinvest revenues earned through royalties/tech licensing/equity in incubated startups



1. Conduct research with a goal of commercialization

- Strong industry partnerships, mentors from industry, understanding the needs of industry

01

2. Develop pathways for translation

- Sell IP or license technology for royalties/equity
- Creation of deep-tech/ deep-science startups
- Market the available technologies to industry

02

3. Manage the commercialization of technology

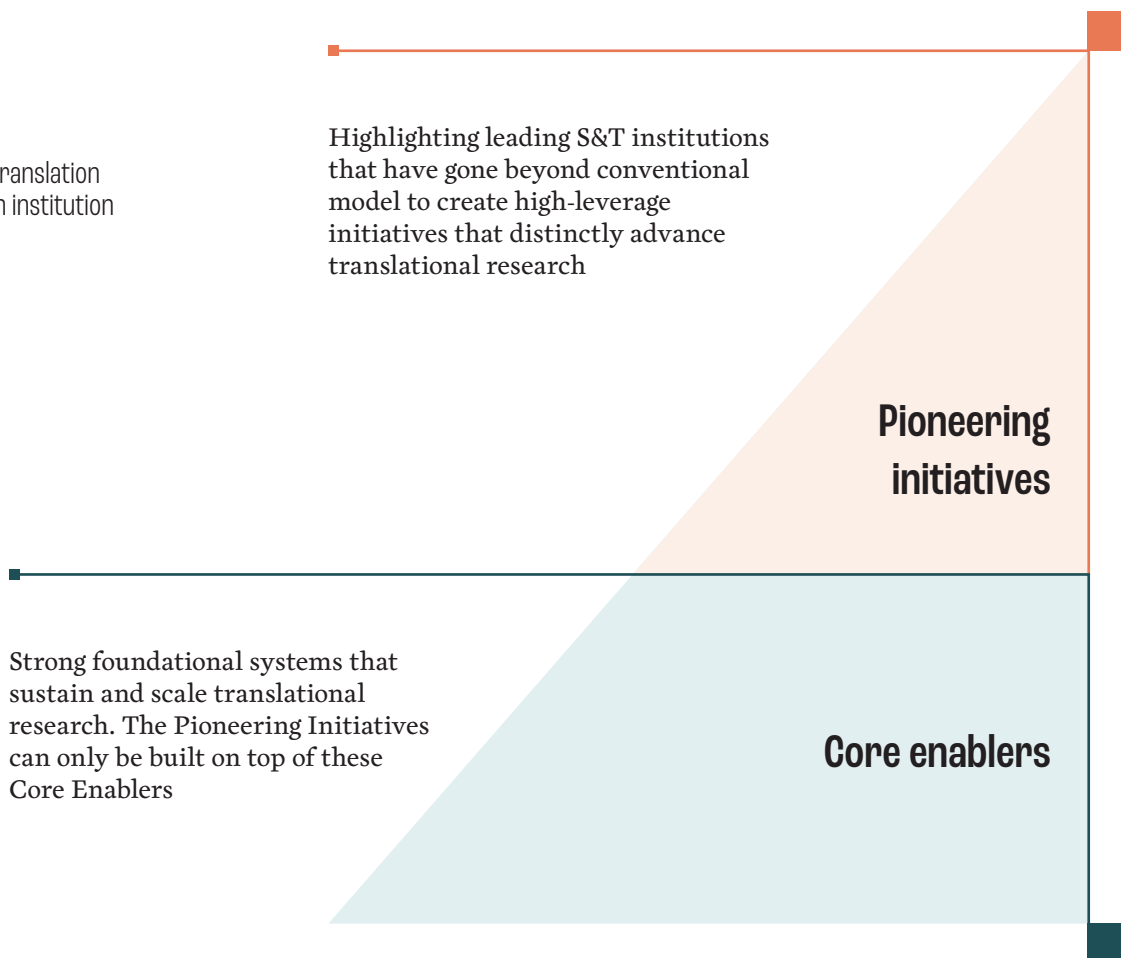
- Post-deal management and support
- Knowledge Transfer

03

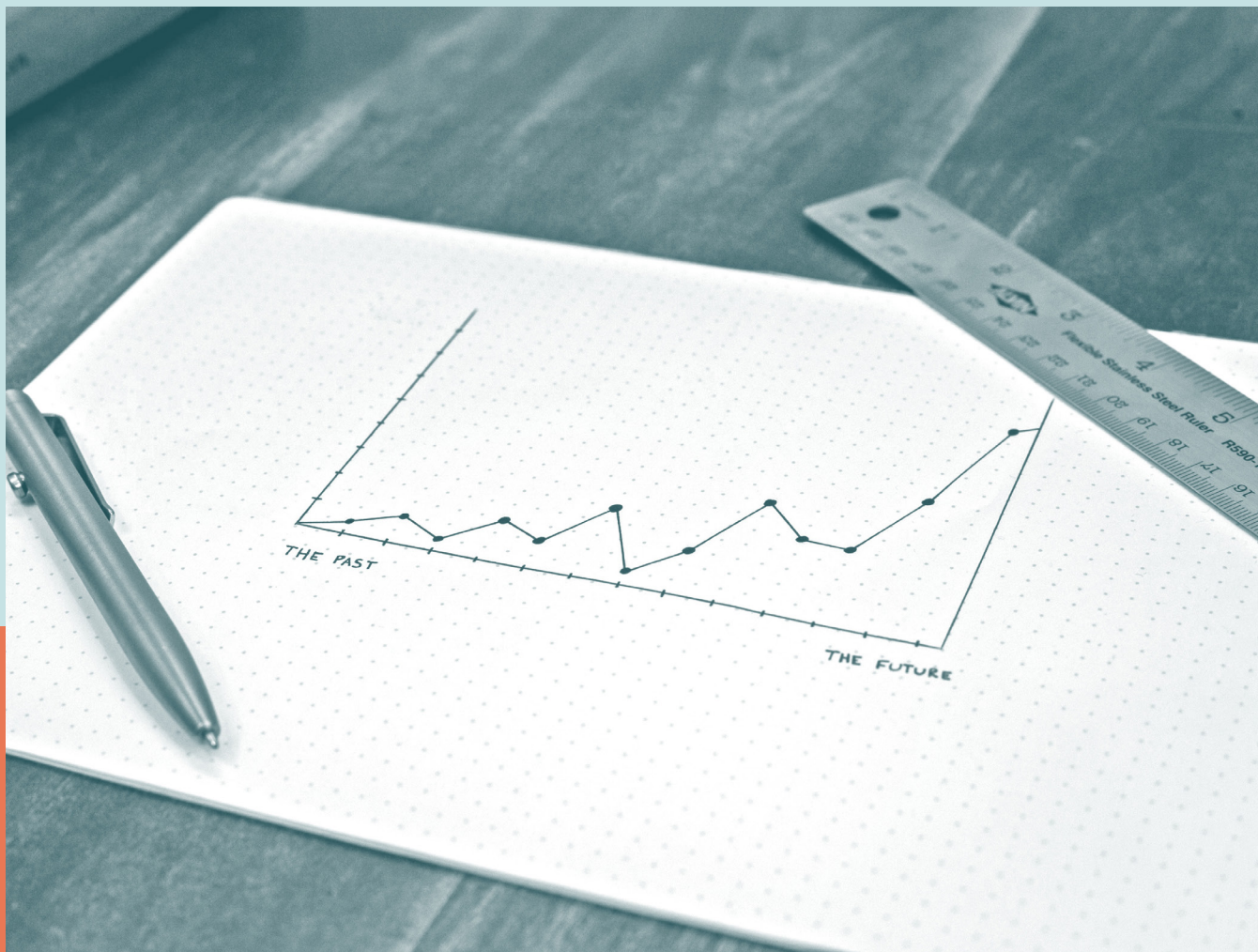
This report particularly focuses on S&T academic and research institutions and their role in facilitating research translation. It captures pioneering initiatives and core enablers at a select-few leading S&T institutions that attempt to transform academic research into real-world applications and products.

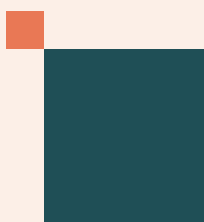
We hope that this report will serve as inspiration for institutions to learn from each other's practices and initiatives, as well as serve as a guide for institutions who aim to increase their translation output.

Figure 5:
The Research Translation
Ecosystem in an institution



Measuring Translational Research Outcomes at top Indian S&T Institutions





In the following section, we present the quantitative translational research outcomes of the eight S&T institutions covered in the report¹. A short introduction on all the institutions is given in Annexure 1.

The metrics showcased below illustrate the extent and nature of each institution's progress in terms of startup success, industry engagement, and licensing/royalty income earned. However, it is important to note that the institutions vary greatly in size, scope, and objectives. Therefore, a one-to-one direct comparison is not possible.

Table 1:
Quantitative parameters measuring translational research outcomes of the S&T institutions covered in the report

Startups

Parameter	Institutions							
	IIT Bombay	IIT Delhi	IIT Madras	IISc Bangalore	C-CAMP	BITS Pilani	Venture Center	IIIT-H
Total number of deep-tech startups incubated till date	262	150+	365	118	500+	84	300+	250+
Total valuation of startups incubated ²	USD 3.6 billion	~USD 500 million	USD 6 billion	USD 373 million+	USD 1.6 billion	~USD 1 billion	Not available	USD 170 million+
Revenue generated by incubated and active startups (for FY 23-24)	INR 3000 crore+	~INR 320 crore	INR 4000 crore	Not available	Not available	INR 2.89 crore	INR 300 crore+	INR 30 crore

¹ These parameters have been sourced from the institute's annual report, website or via FAST's POC at the institute.

² Please note that the data on valuation of startups has been provided by the respective institutes and is only for the startups incubated at their incubation cell. The method used for calculation of the total valuation of startups incubated may vary significantly for each institute. For example, IISc Bangalore only tracks this number if a startup had raised capital through institutional investors and a proper valuation was done. As of date, 23 IISc incubated startups have raised funding and the valuation is over USD 373 million.

Industry engagement

Parameter	Institutions							
	IIT Bombay	IIT Delhi	IIT Madras	IISc Bangalore	C-CAMP	BITS Pilani	Venture Center	IIIT-H
Research funding and income earned from industry (for FY 23-24)	INR 171.2 crore	INR 37.24 crore	INR 584.9 crore	INR 96.6 crore	Not valid	INR 6.61 crore	Not valid	INR 3.96 crore
Number of research projects with industry (for FY 23-24)	Not available	137	Not available	188	100-150	55	Not available	16

Tech transfer

Parameter	Institutions							
	IIT Bombay	IIT Delhi	IIT Madras	IISc Bangalore	C-CAMP	BITS Pilani	Venture Center	IIIT-H
Income earned through royalty/licensing/tech transfer (for FY 23-24)	INR 3.35 crore	INR 5.43 crore	INR 1.5 crore	INR 4.7 lakh	INR 40-50 lakh	INR 1 lakh	Not available	0
Number of royalties/licensing agreements/tech transfer (for FY 23-24)	17	11	18	8	~10	1	Not available	0

Pioneering initiatives and differentiated practices





India's leading S&T institutions have gone beyond conventional models to create high-leverage initiatives that distinctly advance translational research.

These pioneering practices—ranging from industry-mentored PhD programs to innovative frameworks like research credit systems and dedicated translational units—signal a shift toward outcome-driven, industry-aligned, and startup-enabling ecosystems.

This section highlights unique interventions that exemplify institutional risk-taking, structural innovation, and strategic alignment with market and societal needs, setting new benchmarks for others to emulate.




The programs/practices have been clubbed under specific themes based on their approach and objective. Any individual/institution wanting to achieve a certain outcome can learn about specific programs designed for that purpose.

PhD programs aimed at creating real-world applications

Theme 1

1.1

PhD Program leading to Deep-tech Research, Innovation, Value generation & Entrepreneurship (PhD DRIVE)

	Institute	BITS Pilani
	Beneficiaries	PhD students
	Outcome	Creation of deep-tech startups by PhD students

About

The PhD Drive (Deep-tech Research, Innovation, Value generation & Entrepreneurship) program was launched by BITS Pilani in 2024. The PhD program aims to result in the creation of a startup based on the research done during the PhD. Its objective is to increase the number of deep-tech and deep-science startups that will solve pressing societal and business problems.

The PhD Drive program was built on the understanding that doctoral students spend three to four years working intensively on a specific scientific or technological problem, gaining deep expertise in a highly specialized area. This makes them well-positioned to translate their research into impactful solutions. Moreover, studies show that startups founded by individuals with postgraduate education are more likely to succeed—for instance, a study published in the *Journal of Technology Transfer* shows that founders with doctoral-level education were more likely to secure equity investment and achieve successful exits (Ratzinger et al. 774). With the right support, PhD researchers can become ideal founders of deep-tech and deep-science startups. A program focused on research commercialization can provide them with the guidance, resources, and motivation needed to bring their innovations to market.



Features

- The PhD Drive program differs from its contemporary PhD programs in that there is an expectation that there should be an IP associated with the PhD project. There is an explicit expectation to demonstrate a Technology Readiness Level (TRL) of 4-5 (product tested in a controlled environment) by the end of the fourth year. While it is not a requirement for the PhD student to start their own company, the hope is that at least a few of the projects will lead to the creation of deep-tech and deep-science startups.
- To enable students to focus on commercialization efforts, the program offers relaxation in teaching duties, allowing them more time to develop and advance their projects.
- The program provides a higher monthly stipend of INR 65,000 compared to typical PhD programs.
- Currently, there are 14 students enrolled in the program, with six to ten candidates planned to be selected for the next cohort. Various Centers of Excellence (CoEs) such as BITS BiocyTiH, Anuradha and Prashanth Palakurthi Centre for Artificial Intelligence Research (APPCAIR), and Center for Research Excellence in Semiconductor Technologies (CREST) fund the PhD Drive program.
- The program has shown some promising results in a short span, with four candidates receiving seed funding.
- Students also get access to the Technology Business Incubator at BITS Pilani in exchange for five percent equity stake.
- The program has an ambitious goal of incubating 100 deep-tech startups by 2030.

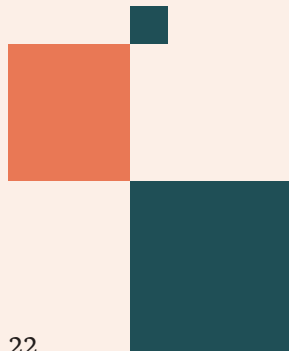
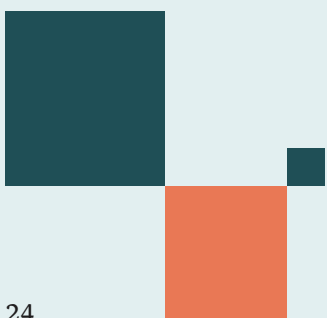
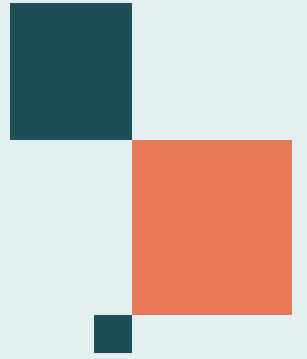





Figure 6:
Journey of a PhD candidate who is part of the PhD DRIVE program at BITS Pilani (Source: PhD Drive website)





1.2

Industry Mentored PhD Program in Advanced and Cutting-Edge Technologies (IMPACT)

	Institute	BITS Pilani
	Beneficiaries	PhD students/industry professionals
	Outcome	Solutions to industry's research problems

About

The Industry Mentored PhD Program in Advanced and Cutting-Edge Technologies (IMPACT) is a PhD program launched in 2024 in which all research problems are derived directly from real-world industry problem statements. The PhD program attempts to form a strong linkage between industry and academia with a specific focus on innovative research aligned with ongoing work and demands of industry.

Features




- **The PhD program is open to practicing professionals who want to pursue high impact and industry-relevant research at their company leading to a PhD degree with BITS Pilani.** There is also an option for fresh PhD students to be co-guided by BITS Pilani and company scientists as a part of the program.
- Currently, there are eight industry professionals enrolled in the PhD, while there are 10 fresh PhD students who are working with industry.
- BITS has established a strong partnership with Wipro Research, with 20 doctoral students sponsored to work on cutting-edge technologies such as smart hydraulics, machine vision, robotics, water treatment, etc. The problem statements for the projects have been sourced from Wipro itself, with regular reviews and discussions.
- The program provides flexibility to the student to divide their time between working at the company and working at BITS as per the requirements of their project.

Dedicated team of translation scientists to make research industry-ready

Theme 2

2.1

Discovery to Innovation Accelerator

	Institute	Centre for Cellular and Molecular Platforms (C-CAMP)
	Beneficiaries	Faculty or scientific team in a government or privately funded organization
	Outcome	Translation of novel technologies into industry-ready form

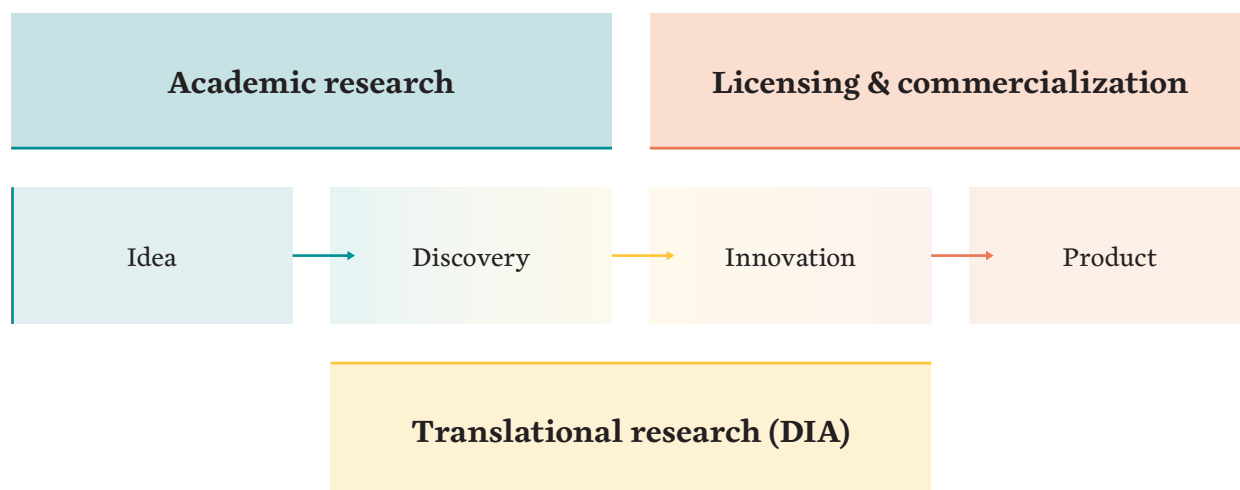
About

The Discovery to Innovation Accelerator (DIA) - a program run by the Centre for Cellular and Molecular Platforms (C-CAMP) - is a unique initiative with the objective of translating academic discoveries to industry-ready technologies in the life sciences. C-CAMP is a section 8 company set up as an initiative of the Department of Biotechnology as a part of the Bangalore Life Science Cluster (BLiSC). It was set up with the mandate to play a catalytic role in promoting research translation and fostering innovation in the life sciences.

The DIA program acts as an accelerator and catalyst in the research ecosystem by creating a mechanism for research translation and filling a crucial gap in the translation roadmap. It works with premier institutes and scientists across India which provides it access to deep science discoveries at an early stage. Following this, the in-house experts at C-CAMP work with industry and academic contributors to de-risk the innovations and translation into industry-ready forms.

Figure 7:

Journey to commercialization for research project in DIA (Source: C-CAMP website)

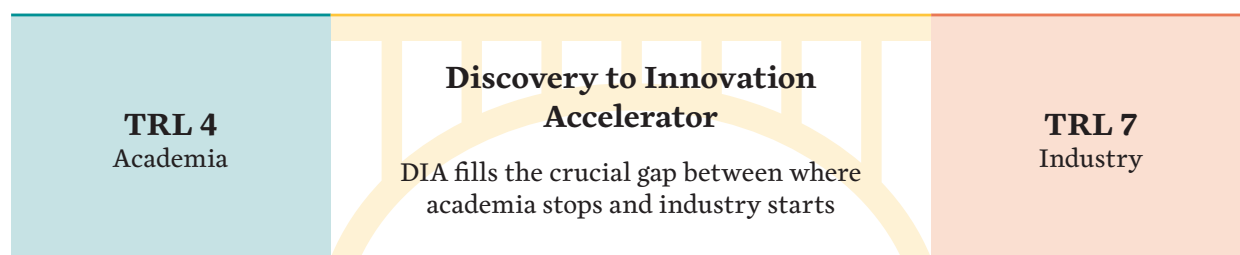


Features

- **DIA operates in the critical gap between academia and industry** - it starts where academia stops and stops where industry starts. Most academic research rarely progresses beyond TRL 4 or 5, and it is rare for faculty to take up entrepreneurship. To address this gap, DIA puts out calls to researchers to submit their innovations, as well as to industry to share their R&D challenges. It is then able to effectively assess which innovations could be converted into industry-ready technologies.
- The proposals selected for translation are then jointly developed by the inventor and the DIA team. An agreement is signed with the applicant/inventor(s) and their organisation, which serves as an academic partner in the project. The project is undertaken collaboratively with inputs from the academic partner, subject experts, and the industry.

Figure 8:

The DIA fills the crucial gap between where academia stops and industry starts





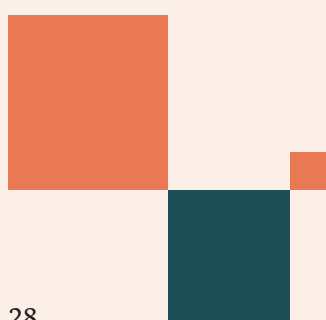
- Generally, academics don't want to undergo the two to three year journey of translating their science themselves. This results in most of the research never moving beyond a publication or IP. DIA's team of **translation scientists** build on the academic research done and take it to the level where industry can adopt it. More details on translation scientists is given in Annexure 3.
- C-CAMP follows a documented practice of industry interest - **all projects are driven by inputs from industry**. Industry is kept involved in the entire process. Right from the start, industry is asked about their needs and requirements. As industry priorities may also change with time, the engagement is dynamic and constant.
- The developed industry-ready innovations and the associated IP/trade secrets/know-how are jointly shared between C-CAMP and the academic partner, with the aim of commercialising it to the relevant industry.
- DIA has evaluated more than 600 projects and licensed more than 10 technologies to date.
- DIA is funded by the Office of the Principal Scientific Adviser, as well as the Pratiksha Trust, established by Mr Kris Gopalakrishnan and Mrs Sudha Gopalakrishnan.

Team structure

The DIA team has multiple subdivisions within it:

- **Program Management Team**
A team of two members overseeing the overall program, putting out the calls for application, and coordinating with the applicants.
- **Project Management Team**
A team of two members overseeing the individual projects being done.
- **Industry Liaison Team**
a team of three members that constantly engages with industry to understand their needs.
- **Lab/Scientific Team**
A team of of 15 to 20 translation scientists which works on the translation work undertaken.

The DIA program is also supported by an IP and Tech Transfer Team which is an external team that takes care of the legal aspects of licensing.





C-CAMP
Pratiksha

CALL FOR PROPOSALS

C-CAMP Translation Challenge
Seeking Academic Discoveries Addressing Industry Problem Statements

15 Industry Problem Statements

Healthcare

- Novel biological/chemical molecules against inflammation, metabolic disorders, and cancer
- Innovative adjuvants for vaccines and immunotherapies
- Novel Antibody-Drug Conjugates (ADC)
- New linkers to create ADC
- Thermostable biologics through novel bioprocess or formulation
- Solutions against acne-causing microorganisms
- Nature-derived ingredients to modulate chronic skin inflammation
- Endotoxin detection and removal methods during bioprocessing
- PoC device for screening, detection and diagnosis of TB, cancer & blood disorders

Agriculture and Allied

- Bioherbicides targeting invasive weeds
- Phage-based solutions for disease control in agriculture and livestock
- Novel biopesticides against pathogens
- Detection of mycotoxins in agricultural produce
- Prevention of spoilage in agricultural produce
- Technologies for large-scale production of Germacrene D, Menthofuran Sabinene Hydrate & Viridiflorol

Scan for more details on problem statements

Open Call High-impact proposals that are not limited to the above industry problem statements can be submitted

How will C-CAMP take your science forward

- Research Translation
- Industry Adoption

APPLY HERE
<https://ccamp.res.in/translation-challenge>

Submission Deadline June 20, 2025

www.ccamp.res.in/dia-attractlife | dia_applications@ccamp.res.in | +91-80-6718 5105/5106

Figure 9:

Communication material used by the DIA team for seeking industry problems and call for proposals for research projects (Source: C-CAMP website)



C-CAMP
Centre for Cellular and Molecular Platforms

Seeking Industry Problem Statements

Selected problem statements submitted will shape custom translation research anchored at C-CAMP

Healthcare Agriculture Environment

Looking for problem statements from industry to build into impactful solutions

Submit your problem statements here: <https://forms.office.com/r/XrpH1uF6Yy>

Let's drive innovation together!

Deadline 15th April

2.2




Product Labs

About

Product Labs at the Indian Institute of Information Technology, Hyderabad (IIIT-H) is the market relevant product engineering arm of the technology transfer office (TTO). It assists in the translation of innovations into products, processes, and services. Its focus is on developing market relevant product prototypes - in collaboration with industry partners - from the research output of the labs at IIIT-H.

Features

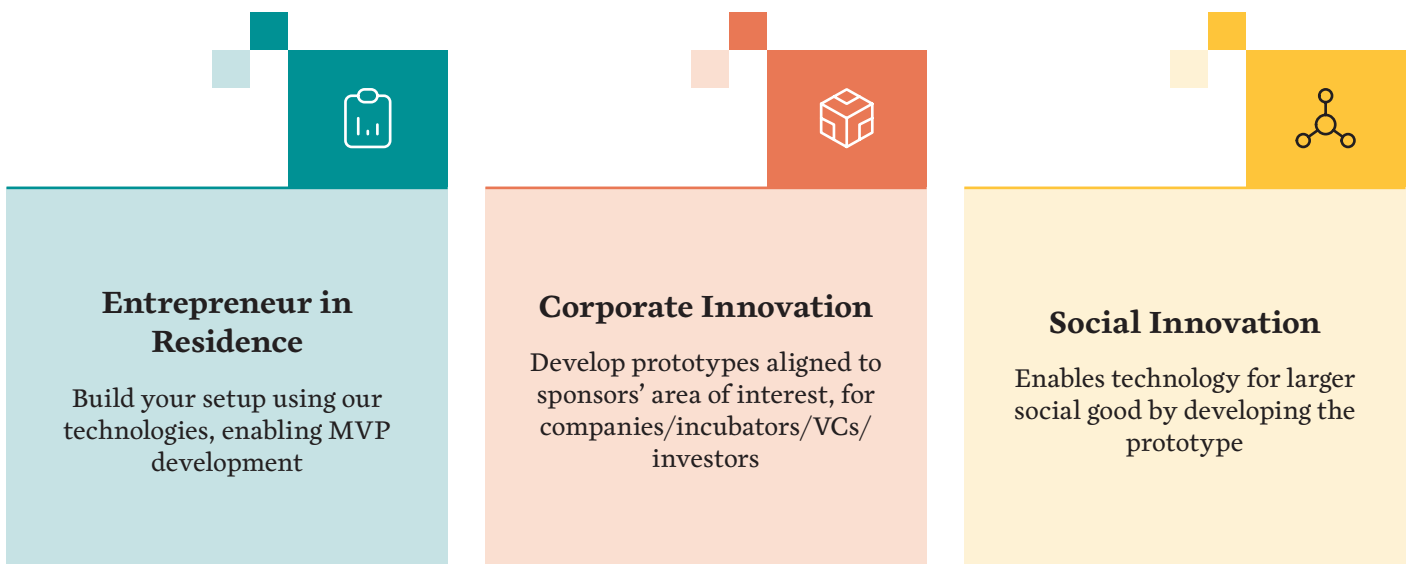
- Product Labs was established in 2018 within the institute’s technology transfer office. The focus of Product Labs is to enable market/licensing readiness of institute research. So far, it has developed 10 technologies that have been licensed to startups.
- The team also curates and brings relevant market/business insights to the institute and defines products based on market potential.

	Institute	International Institute of Information Technology (IIIT-H)
	Beneficiaries	Faculty and researchers
	Outcome	Product prototypes for industry partners

- It was built from the need to showcase a tangible prototype/demo of the faculty’s research work output to industry, rather than just a research paper. The initial idea was to attach a professional engineering team to the research group. The engineering team will help the research team with the prototyping and coding. This idea eventually evolved to Product Labs.
- The team at Product Labs has **eight high quality product engineers and translation specialists** who develop market relevant product prototypes from the research output of the labs at the institute.

Figure 10:

Three different tracks under which the products are designed and licensed as part of the Product Labs at IIIT Hyderabad






Long-term industry-academia collaboration

Theme 3

3.1

CORE Labs by Foundation for Science, Innovation, and Development (FSID)

	Institute	IISc Bangalore
	Beneficiaries	Faculty and researchers
	Outcome	Research projects with industry

About

FSID was incorporated on 8th August 2020 as a Section 8 Company under the Companies Act, 2013. Promoted by Indian Institute of Science, it has now grown to become a single window of access for all stakeholders to the deep science and deep tech knowledge within IISc. It provides a 360-degree set of offerings that facilitates the delivery of its objectives.

FSID has multiple engagement models to support different stakeholders, these include:

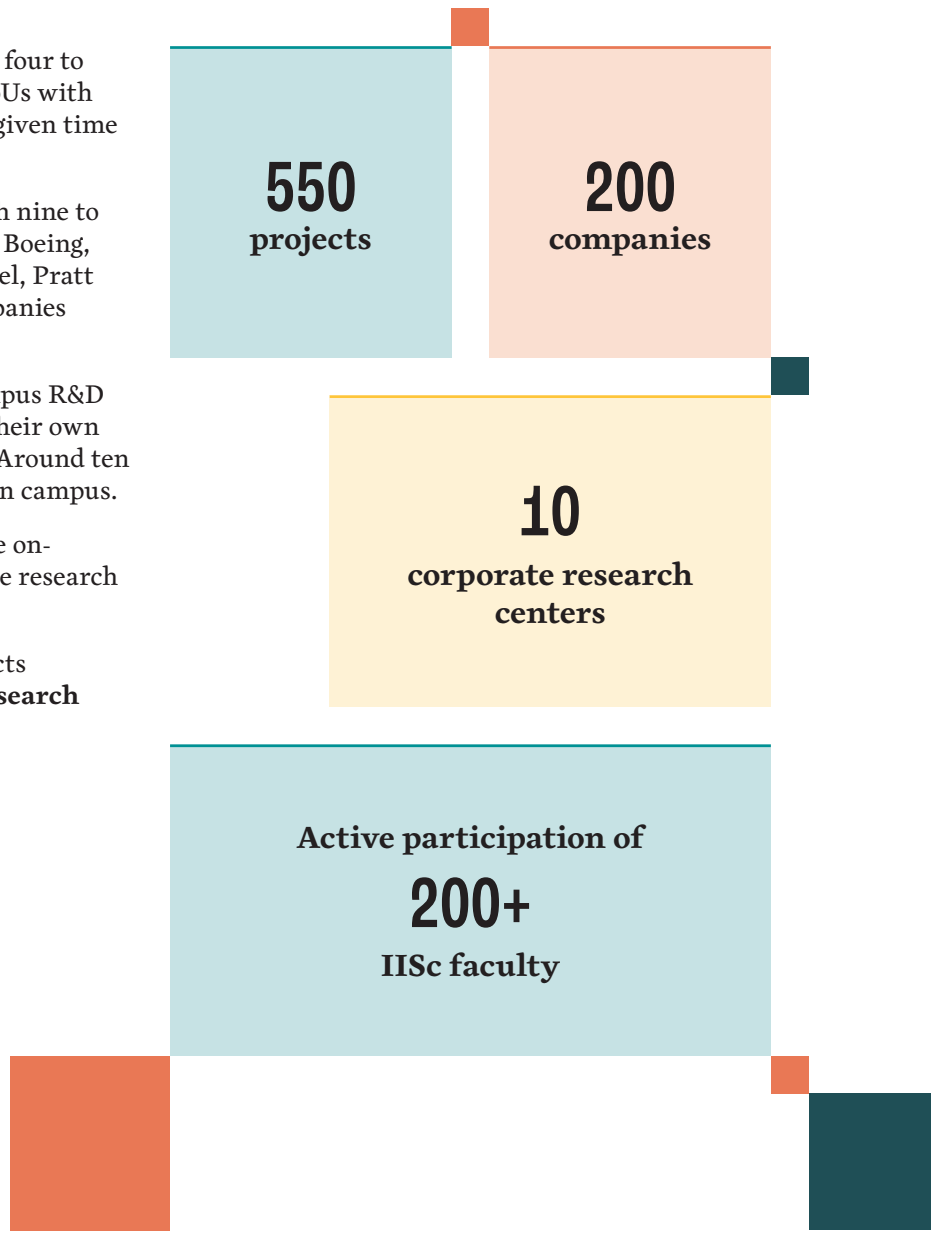
1. **CORE Labs**
A window for the industry to have access to some of the best scientific minds at IISc
2. **STEM Cell**
Domain agnostic deep science incubator
3. **TIME**
Product development for established MSME industries
4. **SEED**
Research and products predominantly focused on agriculture and allied activities
5. **Strategic Programs**
Bootstraps multiyear complex projects of national importance funded by the Government of India, Government of Karnataka and government entities

When enterprises seek out IISc faculty and researchers with significant and intriguing questions that have scientific knowledge at their core, FSID creates a platform for collaborative research to solve them, as part of the CORE Labs initiative.

Features




- FSID collaborates with industry through long-term research projects. They do not take up consulting assignments.
- **Long term relationships** (minimum four to five years) are established through MoUs with companies. 150 to 160 projects at any given time at IISc are funded by industry.
- Unilever is the oldest engagement with nine to ten projects ongoing at the same time. Boeing, British Telecom, BHEL, TCS, Tata Steel, Pratt & Whitney are some of the other companies working with FSID.
- Companies can establish their on-campus R&D labs which can either be managed as their own labs or through faculty collaboration. Around ten such R&D labs are currently present on campus.
- Companies that have established these on-campus labs have a mandate to provide research grants three times their rent.
- The majority of FSID’s industry projects (82%) **involve co-development of research proposals** with industry partners

Figure 11:
Industry R&D engagement by FSID till date
(Source: FSID website)



3.2

Credit Points System by IIT Madras Research Park

	Institute	IIT Madras
	Beneficiaries	Faculty, students and researchers
	Outcome	Research projects with industry

About

The IIT Madras Research Park (IITMRP), established in 2010, exemplifies a transformative model of fostering innovation through seamless collaboration between academia and industry. It was India's first university-based research park and is a Section 8 not-for-profit company promoted by IIT Madras.

The ecosystem created at the Research Park encompasses the infrastructure, incubators, industry research labs, Centres of Excellence (CoEs), students and research scholars, faculty and field experts. The Credit Point System is a proprietary system created by IITMRP that

is designed to mandate and encourage active collaboration between industry clients of the Research Park and IIT Madras. It ensures companies stay driven to engage with IIT Madras while leveraging the benefits of being in the proximity of one of India's top S&T institutions.

Features

- Companies occupying space in the Research Park must earn 100-150 credit points per 1,000 sq. ft. of space annually
- For example, an R&D company which occupies 10000 sq. ft. of space in the Research Park, has to meet the requirement of 1000 credit points in a year - which can be fulfilled by earning points through collaboration with IITM.
- The credit points requirement of the companies can be met by 28+ varied methods of joint collaboration with IITM like joint R&D projects, consultancy, filing of joint patents etc. The list of the various collaboration pathways are listed in Annexure 2.
- Non-compliance leads to penalties or eviction.
- The collaboration clause is included in rental agreements, making credit requirements auditable by the R&D companies' risk management committees.

Figure 12:
Industry R&D engagement by IIT-M Research Park till date
(Source: IIT Madras Research Park inputs)

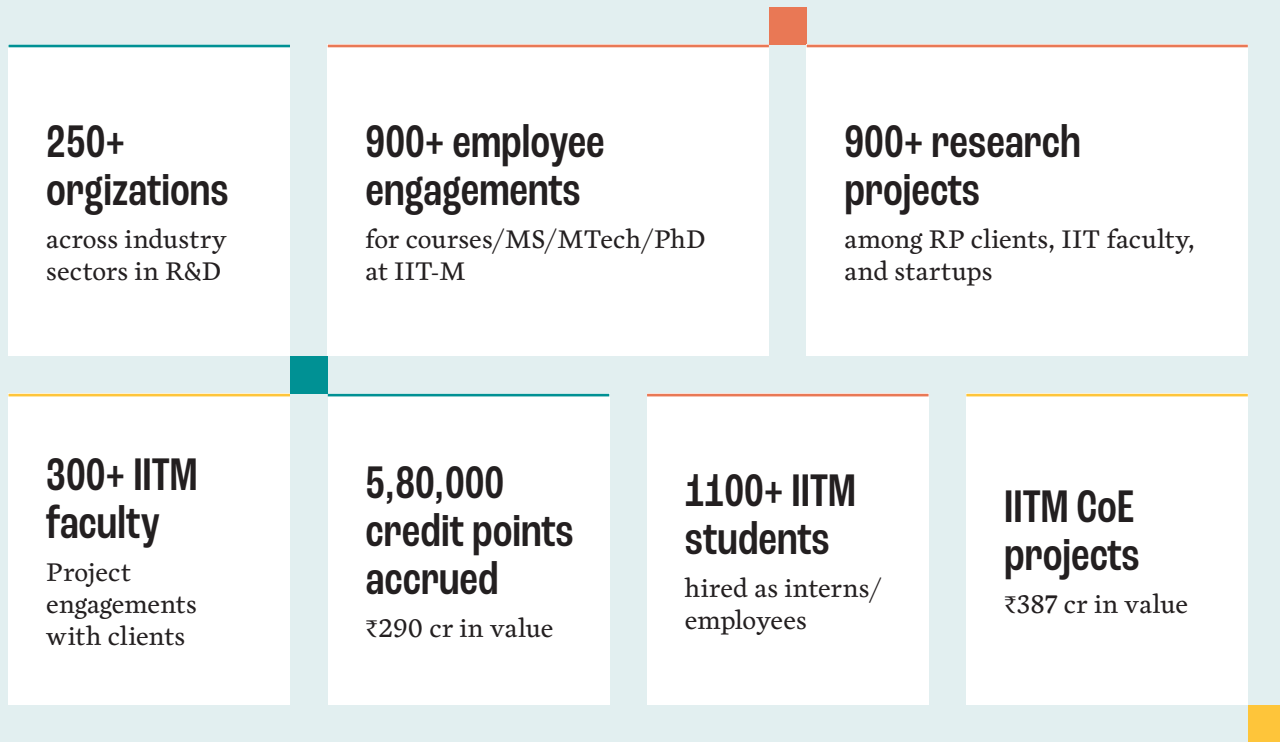
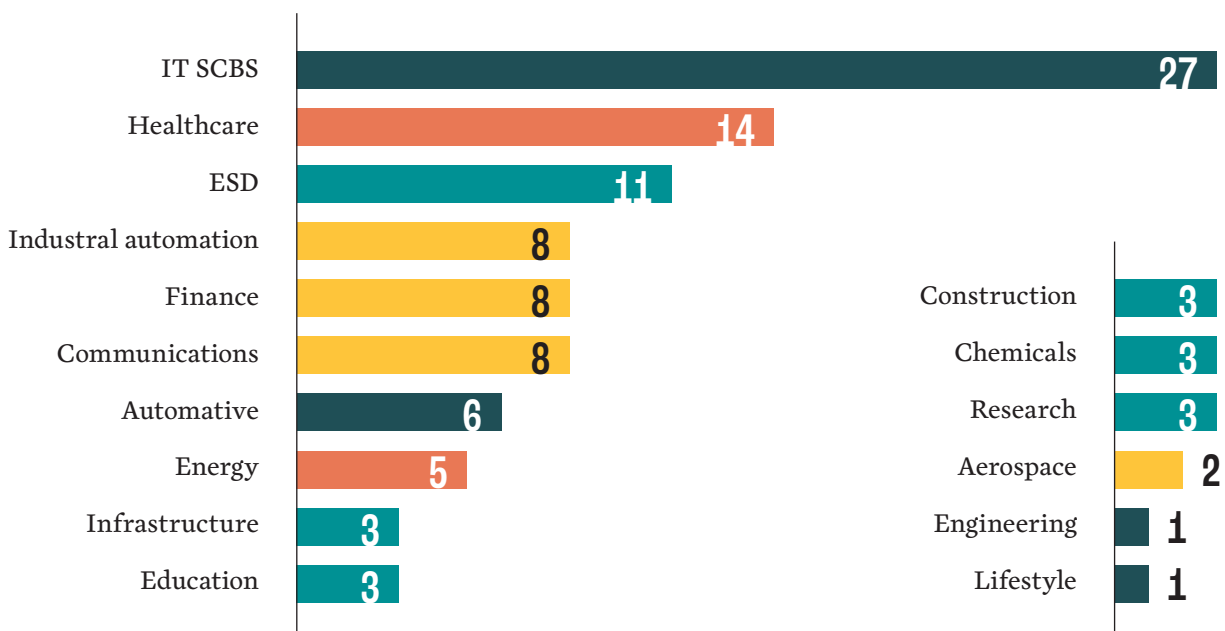


Figure 13:
Sector wise break-up of industry R&D clients at IIT Madras Research Park
(Source: IIT Madras Research Park inputs)






Programs to incentivise faculty entrepreneurship

Theme 4

4.1

Project Titanium by Society for Innovation and Entrepreneurship (SINE)

	Institute	IIT Bombay
	Beneficiaries	Faculty
	Outcome	Startups

Around 7%
of IIT Bombay's professors are engaged in entrepreneurship

About

Society for Innovation and Entrepreneurship (SINE), is an umbrella organization at IIT Bombay for fostering entrepreneurship and nurturing tech start-ups. It administers a business incubator which provides 'start to scale' support for technology based entrepreneurship and facilitates the conversion of research activity into entrepreneurial ventures. Set up in 2004, it is registered as a society under the Societies Registration Act, 1860.

Launched in May 2024, Project Titanium is an initiative by SINE to revolutionize deep-tech research into emerging startups led by professors from IIT Bombay. The core motivation was to **create a structured pathway and provide bespoke assistance** for professors and research teams to commercialize their high-potential innovations.

Conceptualized by a group of IIT Bombay alumni, Project Titanium was initiated with a strong belief in the potential of deep tech research to create massive socio-economic impact.

Participants in Project Titanium

- Technical Co-founder**
 Innovators and researchers at IIT Bombay who are working on intellectual properties (IPs) with a TRL of three or higher. This includes sectors like smart manufacturing, healthcare, robotics, sustainability, clean energy, AI, ML, AR, VR, and more. Faculty members, research scholars, and innovators associated with the institute are eligible to participate.
- Business Co-founder**
 Aspiring founders/ex-entrepreneurs/senior professionals/corporate leaders/domain experts/alumni community who would be willing to work full-time with the startup alongside the technical co-founder. The business co-founder is responsible for taking the research from the lab to the market. This includes developing a go-to-market strategy, handling operations, building business partnerships, securing customers, and raising additional funding.

Support offered in Project Titanium



Figure 14: Support package offered as part of Project Titanium by SINE, IIT Bombay

Other features

- **Flexible equity structure**

Titanium provides a flexible equity structure where innovators, business co-founders, and mentors receive shares based on their contributions. Technical co-founders (usually the innovators) and business co-founders typically receive equal equity stakes, while mentors are given equity from the advisory pool. The exact distribution is decided during team formation, ensuring alignment with the goals of the startup.

- **Personalized Assistance**

Teams receive personalized, one-on-one assistance tailored to their specific needs. Each team's requirements are carefully evaluated and supported individually, without grouping them into bulk cohorts.

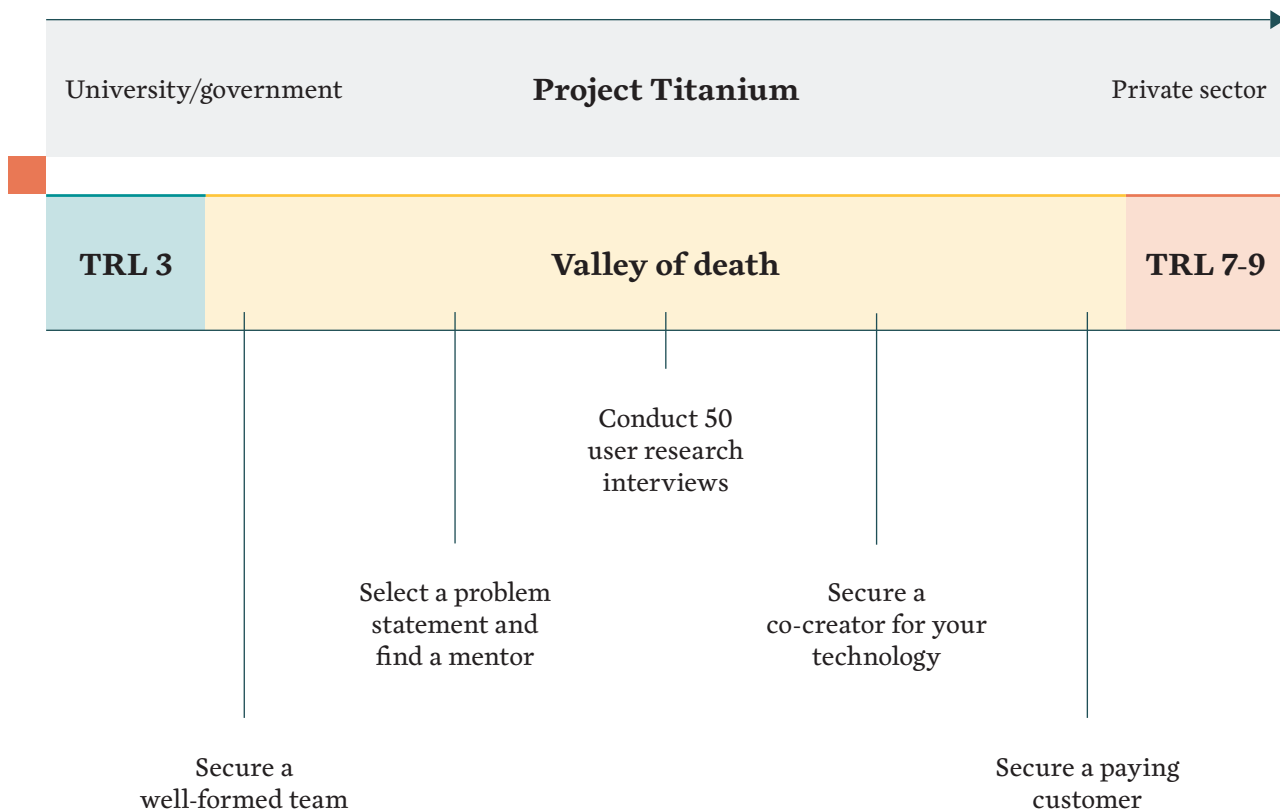
- **Fundraising and Industry Connects**

Titanium provides active assistance in customer acquisition by leveraging its network of industry partners, investors, and advisors to help secure early adopters and partnerships. Based on the progress and potential of the startup in the first year, the Titanium Program will assist in raising further funds by connecting the startup with investors, venture capitalists, and other funding opportunities.

- **Simplified, milestone-based grant disbursal over one year**

There are no limitations on the usage of the grant money - it can be used towards remuneration or other necessary expenses for the progress of the TRL levels. The grant money of INR 50 lakhs is given over a period of one year (in tranches of Rs. 10 lakhs) as per the following milestones:

Figure 15:
How Project Titanium helps bypass the Valley of Death

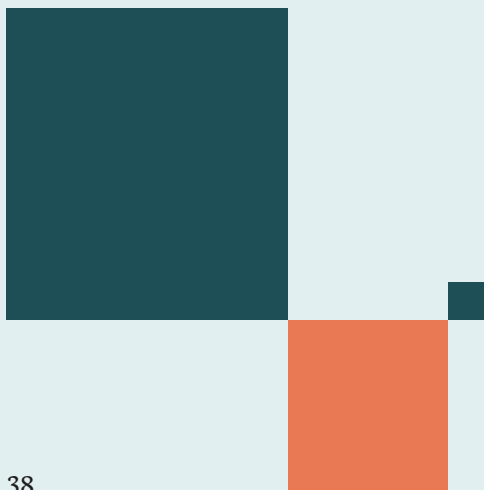


- **Source of Funds**

Two distinguished alumni, Rajesh Jain, Founder and Managing Director of Netcore (B. Tech, Electrical Engineering, 1988) and Ramesh Mangaleswaran, Senior Partner Emeritus at McKinsey & Company (B.Tech., Metallurgical Engineering, 1989) have funded Project Titanium.




- **Some research projects supported under Project Titanium**

Till date, six startups have been awarded the Titanium grant. The first ever Project Titanium awardees include startups like Rheoheme and Ferry Lifesciences. Rheoheme is developing a low cost and low maintenance diagnostic platform for sickle cell disease, malaria and complete blood count for lower and middle-income countries. Ferry Lifesciences is developing a novel microfluidics device coupled with internet of things capabilities that can diagnose and treat anaemia - the commonest nutritional deficiency globally and a condition that affects every one of two Indian women.



4.2

Lab2Mkt by Venture Center

	Institute	Venter Center
	Beneficiaries	NCL faculty
	Outcome	Startups

About

Venture Center is a section 8 non-profit company set up in 2007 as an initiative of the National Chemical Laboratory (NCL) under CSIR's scheme "Scheme for setting up incubation centers in CSIR laboratories". It was incorporated as an Entrepreneurship Development Center and is the first CSIR incubator.

Lab2Mkt is Venture Center's flagship early-stage technology commercialisation program which has been running since 2009. The Lab2Mkt program aims to bridge the gap between innovation and startup creation. Its efforts extend to even before the faculty is ready to start their own venture, by actively reaching out to scientists and encouraging them to commercialise their ideas. Post this, it provides support to them ranging from institutional policy support to mentorship and funding.

Features

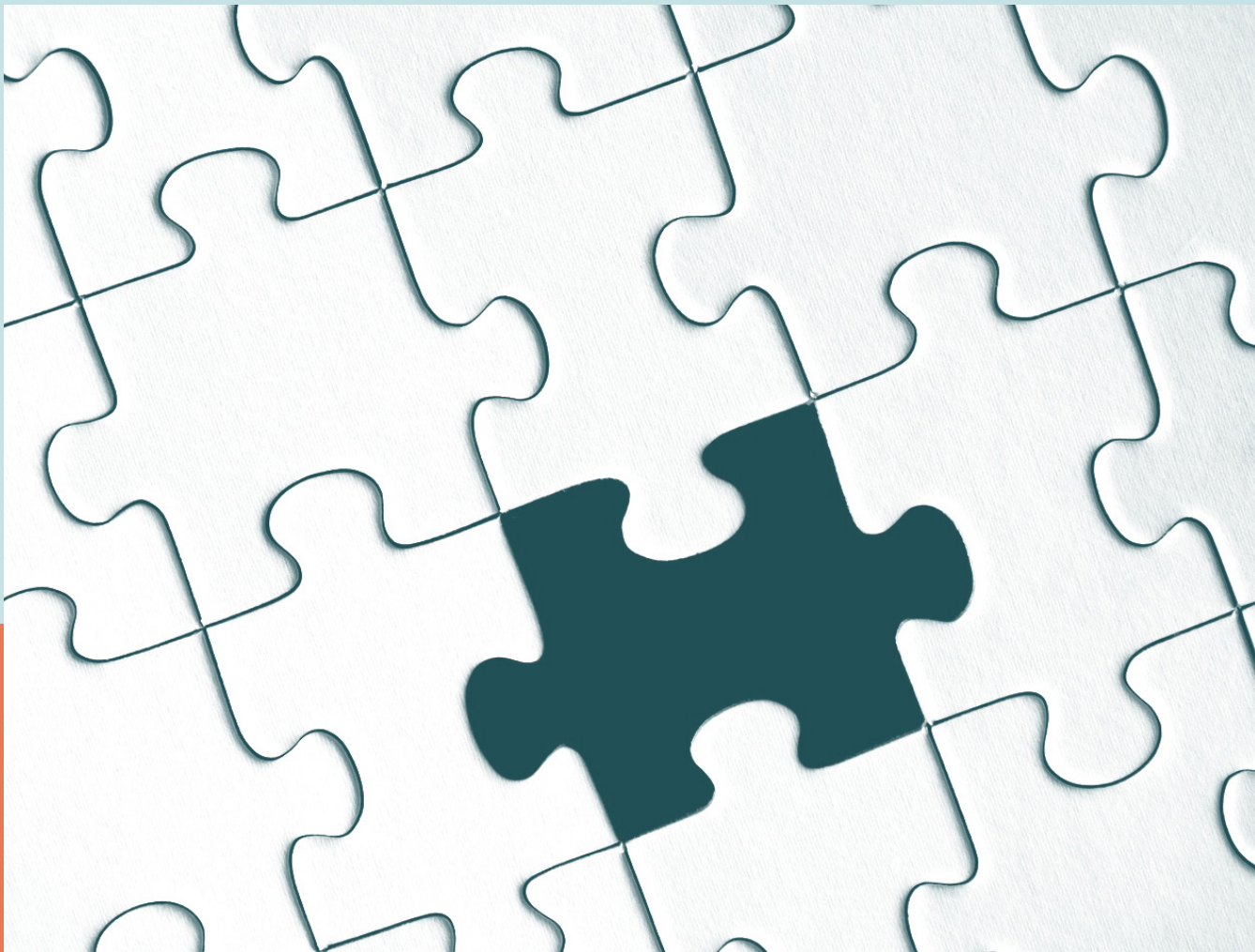
- Under the Lab2Mkt program, Venture Center has framed a comprehensive policy to allow technology licensing from CSIR-NCL to Venture Center and further sub-licensing the same from Venture Center to the startup. The policies are framed such that NCL receives compensation in the form of royalties over time. Venture Center monitors the Lab2Mkt portfolio companies to ensure adherence to this framework.
- Under the Lab2Mkt program, each company will have one founder from NCL, who typically is an NCL scientist and at least one more non-NCL co-founder to manage business functions. This structure creates a team with complementary expertise while allowing NCL scientists to manage their responsibilities at NCL as well as towards the startup.
- Venture Center provides support to the NCL scientists in filing the application for the Scientist Entrepreneurship Scheme (SES) - a scheme that CSIR scientists must apply to before they can start their own ventures. It also plays a crucial role in scouting the research that could be commercialised from NCL, and encouraging

the scientists to embark on the entrepreneurship journey. Post this, Venture Center assists the scientists with building a team, setting up their startup, finalising ownership structure, raising funds, and pitching for grants. It further supports the startup with mentorship, for prototyping, regulatory requirements in product development, designing their preliminary business model, etc.

- The Lab2Mkt program has so far led to the creation of 11 spin-offs through research done by scientists at NCL. The companies are listed below:
 - a. **Abhiruchi Probiotics**
A health and wellness company involved in developing probiotic products
 - b. **Genrich Membranes**
Manufactures Hollow Fiber membranes for gas and niche liquid separation applications
 - c. **Module Innovations**
Building diagnostic solutions for infectious disease and antimicrobial resistance
 - d. **Barefeet Analytics**
Expertise in the broad areas of trace analysis from food, produce, biofluids, and pharmaceuticals. Provides analytical testing facilities for their clients.
 - e. **Green Pyramid Biotech**
A health and wellness startup that produces products such as vegetable and fruit wash, meat wash, sanitizers, and body wash.

- f. **Fluorogent Analytics**
Developing fluorescence-based reagents and diagnostic kits for early detection of biomarkers which can warn against cardiovascular disease, Alzheimer's, schizophrenia, among other health conditions.
- g. **ZeroPlast**
Developed an alternative to single-use plastic which will break down completely and safely in home compost bins and natural soil environments.
- h. **Rechargion**
Developing sustainable, affordable, and green energy storage solutions in the form of Sodium-ion batteries and Lithium-sulfur batteries.
- i. **OrthoCrafts**
A material science focused startup developing affordable biomedical devices for Indian and foreign markets.
- j. **Serigen**
A tissue regeneration products company, leveraging the materials science of natural silk proteins to develop novel biomedical products.

Core enablers and essential practices





The focus of this section is proven models that are widely recognized as necessary components for any institution serious about building its translational capacity. While pioneering initiatives set institutions apart, it is the presence of strong foundational systems that sustains and scales translational research.

The essential practices—such as robust incubation support, active technology transfer offices, and an enabling leadership culture—form the backbone of any effective research translation ecosystem.

If an institution is just starting out in building its translational research capacity it should first focus on putting together these core enablers that will form the base over which specific, differentiated initiatives can be built. The following sections will act as a guide on what these systems look like, how they can be built and some examples from Indian S&T institutions that have successfully designed such systems over the past few years.

Technology Transfer Office and IP Cell

Introduction

A Technology Transfer Office (TTO) is a specialized department within academic institutions or research organizations for managing the transfer of technology and knowledge from research and development activities to practical applications in the market (DST-Centre for Policy Research et al. 1). These offices play a crucial role in facilitating the commercialization of innovative ideas, transforming them into tangible products and services that benefit society.

The DST-Centre for Policy Research at Panjab University conducted a study to understand the national and international technology transfer topography. The study highlighted the crucial role

TTOs play in bridging the gap between academia and industry and in generating value from scientific knowledge, and identified critical gaps and challenges faced by TTOs in higher education and research institutions in India.

It found that many TTOs in India lack a clearly defined team structure and require capacity building and training for their professionals (11). They also face issues such as a lack of specific legislative norms dedicated to technology transfer at the national level, with only institute-level guidelines existing (58). Financially, very few TTOs in India are self-sustainable, primarily relying on government funding (34).

Outline of the Technology Transfer Process

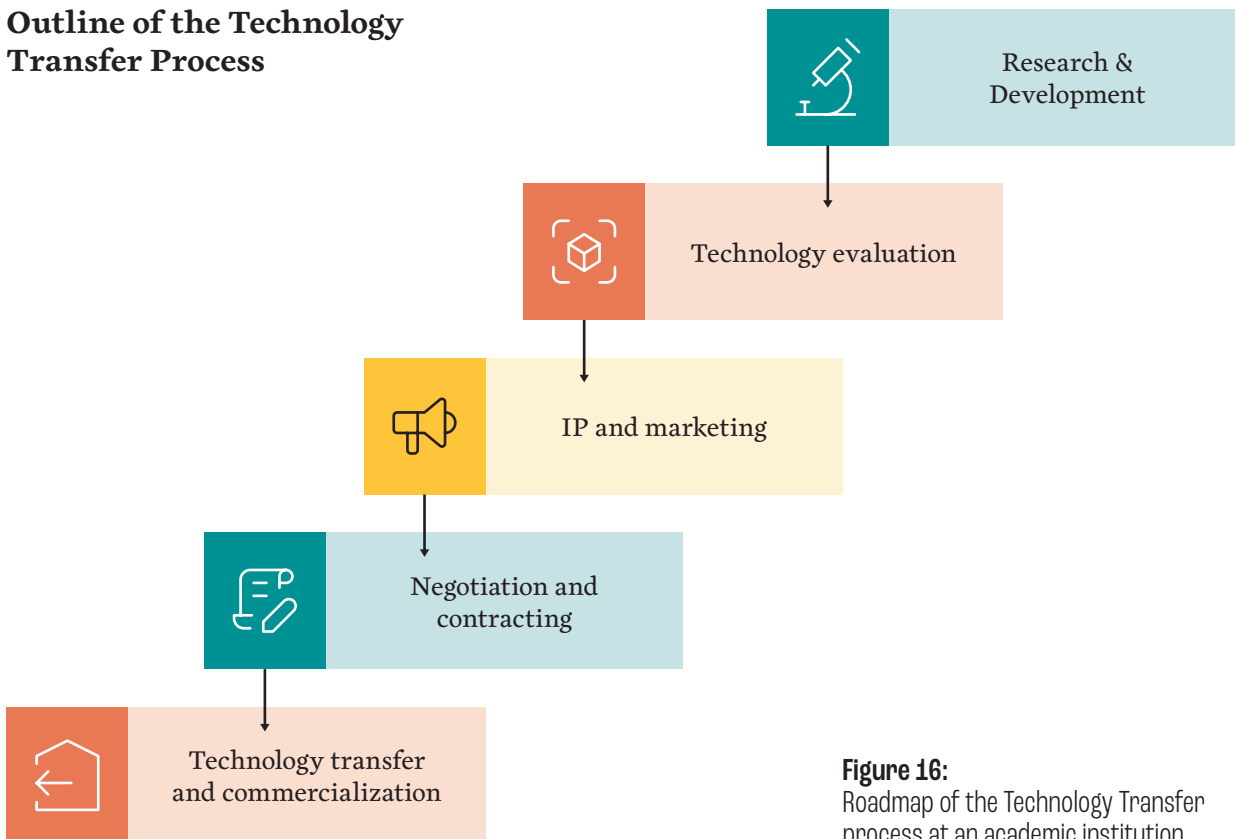


Figure 16: Roadmap of the Technology Transfer process at an academic institution

1. Research & Development

This initial phase primarily involves problem identification, selection of aligning technology, and presenting potential solutions, culminating in laboratory work and prototype development. While researchers drive the R&D, the TTO’s role begins in identifying and assessing the commercial potential of nascent inventions. TTO staff may assist researchers in identifying funding opportunities for technology development, including government grants and private investment. They also provide guidance on intellectual property (IP) protection early in the development cycle, ensuring that

new creations are adequately safeguarded. Proactive TTOs aim to integrate with the research process to ensure that outputs have market relevance.

2. Technology evaluation

In this step, the TTO is responsible for assessing the potential of technology, including its Technology Readiness Level (TRL). TTO staff evaluate key factors such as novelty, market demand, and patentability to determine the invention’s commercial viability. This assessment also includes technology economic assessment and understanding the end-use and utility

of the technology. This phase is critical for determining whether an innovation can advance to the market.

3. IP and marketing

This is a core functional area for TTOs. Once a potential technology is identified, TTO staff are responsible for securing the institution's intellectual property rights, including patent filings and coordinating with patent attorneys. They manage the IP portfolio to ensure rights are protected and maintained. Simultaneously, TTOs perform market analysis to understand the demand, competition, and potential applications for the technology. They then actively market the IP to private firms, promoting the institution's technologies to potential licensees and investors.

4. Negotiation and contracting

This phase involves the TTO negotiating the terms of the technology transfer with external parties, such as companies or startups. Key activities include negotiating licensing agreements, royalties, equity stakes, or other financial arrangements. Legal contracts are drafted to formalize these agreements, covering aspects like license terms (exclusive or non-exclusive), payment options, data sharing, troubleshooting, and agreements on future R&D.

5. Technology transfer and commercialization

This is the final stage where the technology is transferred to a commercial partner. The TTO provides ongoing support, including assisting the receiving party in integrating the technology into their operations or products, which may involve technical support and troubleshooting. TTO staff may also provide training and knowledge transfer to ensure the recipient can effectively utilize and maintain the technology. The TTO monitors the technology's performance and provides continued support. If the technology has commercial potential, they support marketing and promotion to target customers or industries. Furthermore, TTOs may support the formation of spin-off companies or startups based on institution-developed technologies, assisting with business development, funding, and mentorship. Evaluating the success of the transfer based on predefined metrics is also part of the TTO's role.

Case-in-point for Technology Transfer Offices

1.1

TTO at IIT-H

a. Focus on industry partnerships over licensing and patenting processes

The TTO's primary focus is on fostering industry partnerships and identifying opportunities for licensing, rather than concentrating on the procedural aspects of licensing. The aim is to create meaningful industry linkages that can lead to real-world application and impact of the institute's research outputs.

b. Technology mapping and market alignment

To support this, the TTO maintains a comprehensive technology catalogue, identifies potential products emerging from research, and conducts landscape studies across various technology areas. These efforts help in mapping the innovation potential within the institution and in identifying both opportunities and gaps where research could be better aligned with market demands.

Figure 17: Information about the technologies developed by each research center is available on the IIT-H website (Source: IIT-H website)


Center for Visual Information Technology

Center for Visual Information Technology (CVIT) focuses on basic and advanced research in image processing, computer vision, computer graphics and machine learning. This center deals with the generation, processing, and understanding of primarily visual data as well as with the techniques and tools required doing so efficiently. [T... See More](#)

Technologies :

- Person Detection and Recognition in the Wild
- 360 Degree Stereo Video Camera
- Scene Text Understanding
- Detecting Duplicates and Plagiarisms
- Image Annotation by Propagating Labels from Semantic Neighbourhoods
- Iterative Shadow Removal in Document Images
- Long-Term Visual Object Tracking
- Automated Top View Registration of Broadcast Football Videos
- Glaucoma detection from fundus images
- Anatomical structure identification from OCT volumes
- Text-based Video Question Answering on News Videos
- Facial De-morphing: Extracting Component Faces from a Single Morph
- A generative model for human actions and activities

Person Detection and Recognition in the Wild



Faculty Name - Ahoop M Nambodiri, C.V. Jawahar

Keywords - Person Detection, Exemplar Facial Recognition

State of work - Technology designed and implemented

Type of work - Idea, Algorithm, Data set

[Demo URL](#)

Overview	Potential Applications	Related Publications
<p>Person recognition methods that use multiple body regions have shown significant improvements over traditional face-based recognition. The purpose of this technology is to recognize people in unconstrained images. One of the primary challenges in full-body person recognition is the extreme variation in pose and view point. This technology uses cues from body and face with pose awareness. It uses an approach that tackles pose variations utilizing multiple models that are trained on specific poses, and combined using pose-aware weights during testing. For learning a person representation, a network that jointly optimizes a single loss over multiple body regions is used. $\{r\} \setminus n$ The technology also includes exemplar face recognition, using novel approaches to improve the detection accuracy.</p>		

c. Active faculty engagement and guidance

Instead of emphasizing patent training for faculty, the TTO adopts a more proactive approach by engaging directly with researchers. Through these interactions, the team guides faculty members on how they might reframe or tweak their research problems to better align with industry needs and enhance the potential for translation and commercialization.

1.2

FITT at IIT-Delhi

FITT serves as the academia-industry interface for IIT Delhi, facilitating the translation and commercialization of research. Its functions span intellectual property (IP) management and protection, technology transfer, and the incubation and mentoring of startups. Through these efforts, FITT plays a central role in bridging academic innovation with real-world applications and enterprise. Over the years, FITT has facilitated transfer of more than 200 technologies (across various technology sectors) developed at IITD to various industrial partners for commercialization. Some of the examples of technologies transferred are biogas technology, Smartcane, RT-PCR COVID-19 Diagnostic Kit, Biocompatible Surfactant System for Fluoropolymers, Rapid Antigen Testing kit, etc.

FITT has a team strength of 100 and operates through three main verticals:

- **R&D projects**
The R&D projects vertical handles contract research and development sponsored by industry partners or government bodies.
- **IP and Technology Transfer**
The IP and Technology Transfer (IP/TT) division focuses on protecting the intellectual property generated within the institution—through patents, copyrights, and other mechanisms—and facilitating its commercialization via licensing or technology transfer to startups and established companies.
- **Incubation**
The incubation unit supports early-stage ventures, including both in-house IIT Delhi academic spin-offs and startups from outside the institute.

Functioning of the Intellectual Property and Technology Transfer Team

There is a strong level of collaboration between the R&D and IP/TT divisions. The IP/TT team actively engages with faculty to assess the IP potential of their research. This includes advising on whether a particular research output should be protected, what type of IP is suitable, and the jurisdictions where it should be filed. Once an IP is filed, the division carries out a thorough technology assessment and valuation. The team then works closely with faculty to gain a deep understanding of the technology before initiating outreach to industry.

With experts across various technical domains, the IP/TT team is equipped to identify potential industry partners and assess the fit between academic research and market needs. They share detailed technology briefs with targeted companies and are also responsive to industry interest received via IIT Delhi's websites. Once a suitable partner is identified, the team manages the entire tech transfer process—including negotiations, agreement drafting, and coordination among stakeholders. After a deal is signed – whether it is a licensing agreement or an R&D collaboration – the division continues to monitor payment terms and ensures adherence to contractual obligations, whether based on lump-sum payments or milestone-linked structures.

Startup Incubators

Introduction

Business incubators are institutions that support entrepreneurs in developing their businesses, especially in initial stages. In general, an incubator is a physical location that provides a defined set of services to individuals or small companies (Davies 5). This may include specific types of office space, flexible lease terms, access to technology, financing, and technical assistance (such as marketing, legal, finance, HR, and other business development services). By locating similar or complementary entities in proximity to each other, the incubator may also play a critical role in promoting knowledge transfer, both formally and informally.

An incubator in an S&T institution works on the crucial task of supporting startups that could be formed by students, faculty or any other individual depending on the target audience of the incubator.

Foundations of incubator setup

1. Legal Structure

The team setting up the incubator would need to define its commercial purpose, which refers to the nature of the incubator, i.e., 'for-profit' and 'not-for-profit'.

Table 2:
Characteristics of For-Profit and Not-For-Profit Incubators

Aspect	For-Profit Incubators	Not-for-Profit Incubators
Primary Objective	Revenue generation and return on investment from incubated startups	Supporting innovation and entrepreneurship as a public or institutional good
Approach to Startups	View startups as business opportunities that can provide financial returns	Focus on mentoring and supporting startups to reach sustainable growth, regardless of financial gain
Service Orientation	Services often tied to commercial value; startups may pay for access	Services are largely subsidized or offered free to enable early-stage innovation
Affiliation	Typically independent or corporate-run	Often associated with universities, research institutions, or public bodies
Examples	Corporate accelerators, private incubators, VC-backed	University incubators, government-supported



For research-based and deep-tech startups, it is ideal to choose a not-for-profit incubator as such startups require long gestation periods and strong support systems in their early stages.

The 'non-profit' incubator can choose any of the following legal structures for itself:

- a. Society under Society Registration Act, 1860 or equivalent State Law
- b. Section 8 Company under The Companies Act, 2013 (formerly Section 25 company under The Indian Companies Act, 1956)
- c. Public Charitable Trust

2. Building a team

The core team members of an incubator include full time members that execute the operations of the incubator.

The host organization appoints a representative officer who is usually an employee of the organization. In an academic organization, the representative might be a member of the Faculty or the In-charge of the Entrepreneurship Development Cell. The representative officer is held responsible for taking up the initiative, exploring the feasibility of setting up the incubator with respect to the location and the sector and thereafter creating a basic approach plan.

The Board or Council guides the actions and decisions of the representative officer (Ghosh and Joshi 5).

As the plans for the incubator become more concrete, the immediate requirement of an incubator head/CEO emerges. It should be noted that the representative officer cannot and should not be the CEO. The position of the representative officer is usually a temporary one and the person generally lacks entrepreneurial spirit. It is observed that for the member of the Faculty (where the host organization is an academic institution), it is another additional assignment that does not have any incentive (6).

Figure 18:
Key skills required for building a thriving technology incubator



The prospective roles of the team members of a deep-tech university based incubator matched with their responsibilities and skills are identified in the table. However, it is important to note that these roles are not definitive and can be altered as per the incubators requirements and ecosystem.

Table 3:

Prospective roles of the team members of a deep-tech university based incubator matched with their responsibilities and skills

Role	Core Responsibility	Key Skills
Incubation Head/CEO	Strategic direction, university liaison, partnerships, fund mobilization	Leadership, strategy, ecosystem knowledge
Incubation Manager	<ul style="list-style-type: none"> • Designs incubation/acceleration programs specifically for deep-tech startups (e.g., long gestation, regulatory hurdles) • Provides one-on-one venture building support: business model, pilots, market entry, regulatory pathway • Supports faculty-founded or lab spinout companies 	Deep-tech venture support, startup operations, market linkage, familiarity with grant schemes like BIRAC, MeitY, DST
Translational Research & Commercialization Lead	<ul style="list-style-type: none"> • Understands academic R&D processes and tech readiness (e.g., TRL frameworks) • Evaluates IP/technology from university labs for market potential • Interfaces between faculty and entrepreneurs • Guides technology scouting, PoC support, and industry validation 	Someone with both academic R&D and startup/industry exposure (PhD + tech 40 transfer experience preferred)
Technical Advisor(s)	Domain-specific startup mentoring (can be part time)	R&D or tech background with industry/startup exposure
Industry & Ecosystem Engagement Lead	<ul style="list-style-type: none"> • Brings corporates, industrial R&D labs, and PSUs into the ecosystem • Builds strategic collaborations for validation, piloting, and co-development • Secures CSR/ESG funds, industry grants and VC/Angel funds for startup support 	Corporate partnerships, B2B stakeholder management, technical credibility in front of industry

Finance & Compliance Lead	Budgeting, compliance, fund utilization	Finance, grant management
Communication Lead	Outreach, branding, visibility, event management	Marketing, content creation
Legal/IP Consultant (part-time)	<ul style="list-style-type: none"> Assists with patentability assessments, filing processes, and IP strategy Structures tech licensing deals with faculty or startups Coordinates with the university's IP/tech transfer office (TTO) 	Startup law, tech transfer knowledge

3. Fund Sources

The various sources of funds for an incubator are highlighted in a handbook developed by GIZ India and CIIE, IIM Ahmedabad named '*Handbook for Non-Profit Incubator Managers*'.

The host organization usually provides the initial funds required to set up and start the incubator operations. The expenses would include conducting surveys, travelling to meet other incubator managers and stakeholders, paying service providers for establishing a separate legal entity, registration fees, charges for infrastructural and utility facilities, etc (Ghosh and Joshi 7). The fund available may or may not be adequate for a long time. Therefore, the incubator manager has to look out for different avenues of availing the fund.

3.1. Government grants and schemes

These are often the primary funding source for not-for-profit, academic, and early-stage incubators. Incubators can access funds by registering under Central Government departments or State Governments. These schemes often provide funds for capital expenditure, infrastructural development, scaling up programmes, mentoring, and investments.



Table 4:
Some popular government schemes that provide funding for academic incubators

Source	Description
National Science & Technology Entrepreneurship Development Board (NSTEDB) under the Department of Science & Technology (DST)	NSTEDB supports knowledge-driven and technology-intensive enterprises, primarily non-profit incubators. Its initiatives like NIDHI (National Initiative for Developing and Harnessing Innovations) include programmes such as Seed Support System (SSS), Accelerators, and Centres of Excellence (COE), each with specific funding mechanisms. DST may also offer capacity building programmes for incubators.
Biotechnology Industry Research Assistance Council (BIRAC) under the Department of Biotechnology	As a not-for-profit Section 8 public sector enterprise, BIRAC offers various entrepreneurship development programmes with separate funding support mechanisms, such as the Biotechnology Ignition Grant Scheme (BIG) and BioNEST
Atal Innovation Mission (AIM) under NITI Aayog	AIM promotes world-class innovation hubs and supports incubators by establishing Atal Incubation Centres (AICs), providing grant-in-aid of INR 10 crore to each AIC for up to five years for capital and operational expenditure. It also offers scale-up support to established incubation centres, providing INR 10 crore in two annual instalments for up to three years
Ministry of Electronics and Information Technology (MeitY)	Through its Technology Incubation and Development of Entrepreneurs (TIDE) scheme, MeitY provides financial support of up to INR 155 Lakhs (INR 30 lakhs for infrastructure/operations and INR 125 lakhs for financial support to incubating companies, up to INR 25 lakhs per company) to strengthen Technology Incubation Centres
Ministry of Micro, Small & Medium Enterprises (MSME)	The ASPIRE Scheme for Livelihood Business Incubators (LBIs) or Technology Business Incubators (TBIs) offers INR 30 lakhs for incubator capital expenditure to existing TBIs and INR 100 lakhs for setting up new TBIs. It also provides INR 3 lakhs per idea for incubation and a seed capital fund of INR 1 crore per incubator (or 50% of project cost, or INR 20 lakhs per successful idea, whichever is less) for enterprise creation from innovative ideas
State Governments	Many State Governments, such as Kerala, Andhra Pradesh, Karnataka, Telangana, Madhya Pradesh, Rajasthan, Gujarat, West Bengal, and Bihar, actively support incubators through their start-up policies, start-up funds, and venture capital funds (VCFs)





3.2. CSR Funds

Non-profit incubators, especially academic ones, are valid recipients of CSR funds, which have emerged as a significant new funds stream. These funds are often restricted and meant for specific projects, programmes, or investments within particular sectors. Many incubators tie up with corporates for sectoral or regional innovation programs (e.g., climate tech, agriculture, education).



3.3. Multilateral donors

Non-profit incubators find it easier to seek grants from multilateral donors as they are generally seen as developmental agencies. Programme funding from various stakeholders, including multilaterals, accounts for a majority of the cash flow into an incubator, either as restricted or unrestricted grants. Entities like the World Bank, USAID, UNDP, and GIZ have funded innovation ecosystems in India.



4. Revenue Streams

Non-profit incubators often need to combine several revenue models to generate sufficient funds for operations and start-up support. These include:

4.1. Rent model

Charging rental fees to clients for office or lab space, which becomes a significant income source once the incubator reaches a considerable size. This includes co-working spaces and maker labs.

4.2. Equity model

Taking minority stakes (e.g., 2-6%) in incubated businesses, often in exchange for free or low rent periods. This can generate future income from dividend payments or successful 'exits' (liquidity events), with monies from exits typically reinvested into the funding corpus.

4.3. Royalty model

Earning royalty payments (e.g., around 5% of revenue for about five years) from clients based on their revenues.

4.4. Deferred debt model

Valuing services provided to clients along with the incubator's overheads, and then charging them as an incubation fee. Clients can repay this debt over a period, often after leaving the incubator or reaching an agreed financial target.

4.5. Professional Fees

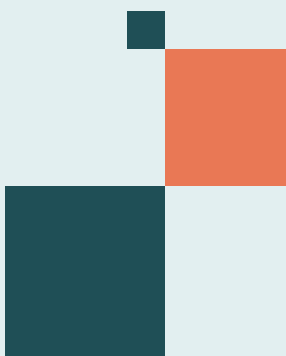
Ancillary revenue from offering knowledge support, such as consulting assignments, capacity building, training, or mentoring. However, high revenues from this source may risk losing nonprofit status.

4.6. Management Fees

Charged for managing investment funds or seed funds (typically 2-3% per annum of the total investment fund) when incubators actively invest in start-ups.

4.7. Sponsorships

Receiving funds from corporate marketing budgets in return for brand visibility, logo presence, or access to future clients.



Startup Support

The key objective of an incubator, to support startups, can be met by a range of activities which involve the following:

1. Infrastructure

Incubators often provide office space, co-working spaces, and laboratory facilities. This can also include new technological facilities and utilities.

2. Training

A lot of the entrepreneurs supported by the incubation centers are first-time entrepreneurs or faculty and exposure to multiple theoretical frameworks is crucial to their journey. Training programs are designed to enhance the skills of entrepreneurs and would cover the full cycle from product development to market analysis.

3. Mentorship

The institution should have a hands-on approach to mentoring startups from the ideation stage to funding. Mentors can be experienced leaders of industry, including alumni with long years of industry experience.

4. Funding

Specific funding support for the startups at various stages is required considering a startup's lifecycle through the innovation ecosystem. Incubators can source funds for startups through various direct and indirect mechanisms, often leveraging their own funding streams and connections to external funding bodies.

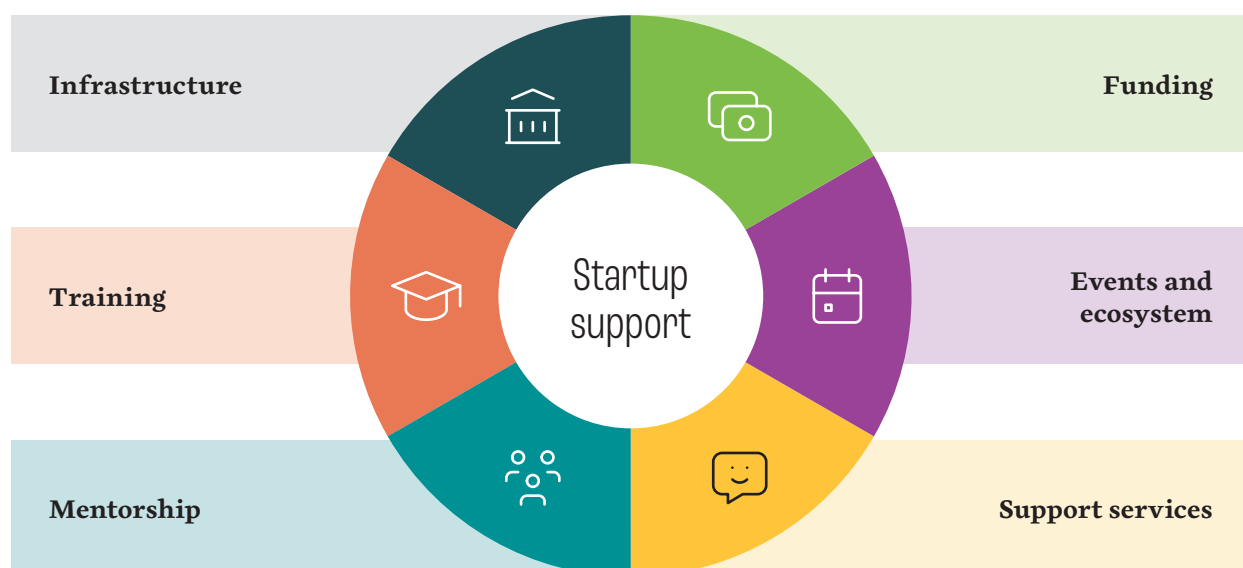
5. Events and ecosystem

The events that can be conducted include Open Houses, Start-up Fests, Panel Discussions, Network Expansion Workshops, Seminars, Investor Meets, Road Shows, Conclaves/Conferences/Summits. To scout innovative ideas and provide feedback, incubators can run multiple competitions and challenges including Business Plan Competitions, Ideathons, Startathons, Hackathons, and Boot Camps.

6. Support services

These include essential business support services, including accounting, legal, company secretary and IP.

Figure 19:
Activities for startup support by an incubator



Case-in-point for startup incubators

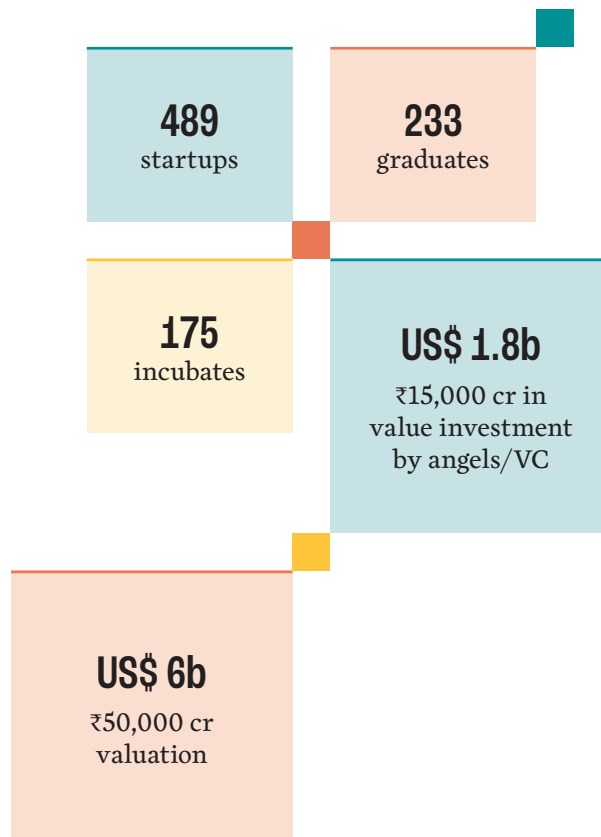
2.1

IITM Incubation Cell

Registered as a not-for-profit Section 8 Company, IITMIC is recognised as a Technology Business Incubator by Startup India, DIPP and NSTEDB, DST, Government of India. With an impressive startup survival rate of 80% (which is typically 8-10%), it has emerged as one of India's leading deeptech startup hubs. 60% of the founders are non-IITians, showcasing the large reach and diversity of the beneficiaries of the Incubation Cell.

In FY 24-25, IITMIC reached the milestone of incubating 100+ deep tech startups in a year. **They are now part of the 489 deep tech startup ecosystem, which includes two unicorns (Uniphore and Ather Energy) and one IPO—Ather Energy.**

Figure 20:
Impact of IIT Madras Incubation Cell
(Source: IIT Madras Incubation Cell LinkedIn)





Some of the distinguishing features of IITMIC are as follows:

a. Passionately nurturing startups with an emphasis on commercialization

Every incubatee is nurtured individually and the idea that technological success is meaningless without commercial success is emphasized.

b. Integrating Incubation Cell and Research Park

Legally, the Research Park and the Incubation Cell are two separate entities with separate purposes. However, they work very closely with each other and there are multiple programs that run across both organizations. This integration allows for effective and diverse collaborations.

c. Strong startup support activities

Startups benefit from mentorship, funding, and credibility through the IITM Incubation Cell, alongside access to world-class R&D facilities, networking opportunities, and comprehensive operational support.

d. 'People-first' approach

The team believes in assessing founder(s) strength rather than the product idea. The quality and entrepreneurial ability of the founder is given more prominence over the idea. Frequent one-to-one interactions with entrepreneurs are done to coach and guide them as well as track progress.

e. Easy funding hurts

This mantra is strongly embedded in the working of the incubation cell and in fact, the same is strongly advocated for all startups supported by it. Like any other startup, the priority of the incubation cell for itself is sustainability, revenue generation and growth. IITMIC consciously decided to avoid relying on grants, which is a key factor in its long-term financial health.

f. Strategic equity stake

The Incubation Cell takes strategic equity stakes in the incubated companies. The latest example of success from this model is the IPO of EV startup Ather Energy in 2025 – the 5% stake held in the early days of Ather by IITMIC and IITM Rural Technology Business Incubator (RTBI) would be estimated at over ₹50 crore, translating into a remarkable 32000% return on investment (Gohel). With a vision to generate Rs 50-60 Cr annually from such stakes held across different startups, IITMIC has proven that equity investments in start-ups can indeed create substantial wealth.

g. Independent Governance

The IITMIC functions independent of the government and IITM and is governed entirely by its Board. It is supervised by the Board for policy but there is no day-to-day interference in its functioning.

Even for its incubated companies, the incubation cell advocates Board driven companies with prominent industrialists and few faculty. Independent committees with external members for seed-funding and loans are constituted.

h. Integration with IIT Madras

The students, the faculty, the research and everything else that goes on in the IIT Madras campus is integrated very closely with the Research Park and Incubation Cell. The Innovation Hub, located in IIT Madras, serves as a pre-incubation space, helping students develop ideas into startups through bodies like Centre For Innovation (CFI) and Nirmaan. Alumni support through mentorship and funding, combined with a strong pre-incubation process, ensures technologies are mature before entering the startup phase.

2.2

Bio-incubation at C-CAMP

The Bio-incubator at C-CAMP is funded by BIRAC under the BioNest Scheme and NITI Aayog under Established Incubation Centre (EIC) AIM scheme. C-CAMP has created a high-end bio-incubation facility of 44,000 sq ft supported by various Govt agencies, both at State and Central level.

The bio-incubation program at C-CAMP offers access to advanced equipment, shared laboratory spaces, high-end core facilities, and tailored mentorship from scientific and industry experts. Its flexible incubation model supports both physical and virtual incubation, allowing startups across the country to benefit from its ecosystem. Beyond infrastructure, C-CAMP connects innovators with funding opportunities—such as BIRAC’s BIG grant—and offers regulatory guidance, business development support, and networking platforms.

Startups supported by C-CAMP include companies like Bugworks, Sea6 Energy, String Bio, Eyestem, Pandorum, Achira, and Zumutor, which have collectively raised over ₹550 crore (Kumar).

The domains in which C-CAMP has supported startups include:

1. Medical devices/ MedTech, AI and Diagnostics
2. Drug discovery and development
3. Agriculture
4. Nutraceuticals
5. Industrial/Environmental Biotechnology

Approach to incubation

- C-CAMP’s incubation model involves operating like a scientific institute that attracts and supports the best innovative startups by providing an environment where they feel like co-owners.
- Startups have access to open labs, participate in committees, and drive their own research, operating as research groups within the organization without being professors.
- It prioritizes attracting top scientific talent and ideas, focusing on high-end capability and infrastructure, which sets it apart from conventional incubation models.
- C-CAMP’s revenue model for incubation is derived from the usage of their labs and services, advisory fees, and management fees from investment programs. C-CAMP takes equity in startups only when they make an investment, avoiding it otherwise to encourage high-quality talent to join without reservations.

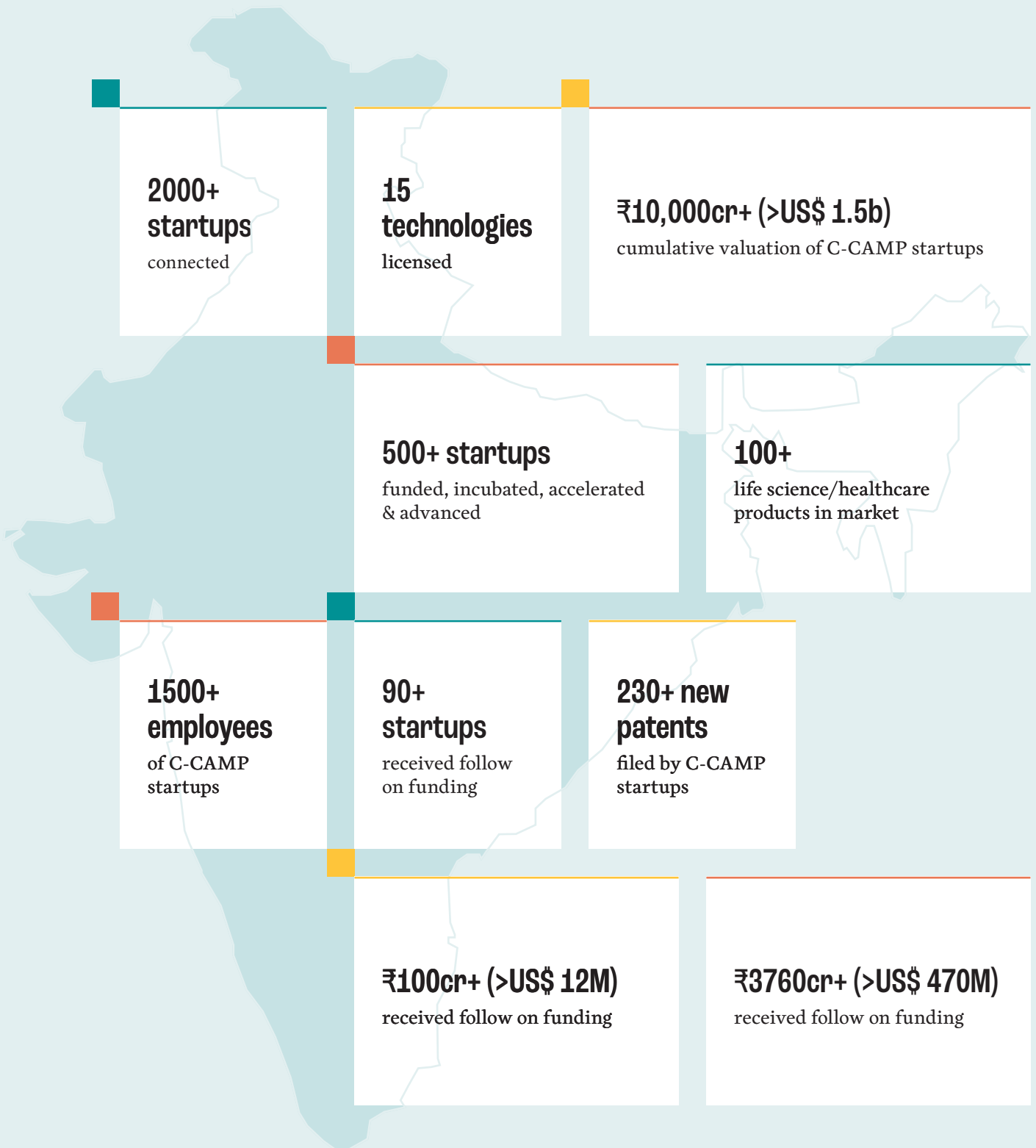


Figure 21:
Impact of C-CAMP's bio-incubation (Source: C-CAMP website)



Leadership, culture and mindset

Leadership models and cultural enablers play a monumental role in building the translational research ecosystem of any institute. Process and culture are two aspects that together define an institution's success. While the right processes and infrastructure are the essential building blocks for any ecosystem, it is the leadership and culture that ensures long term success and impact.

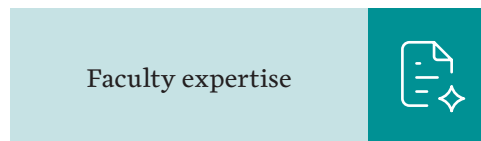
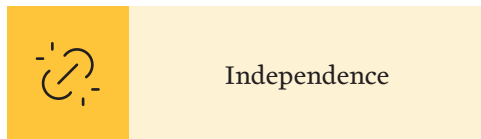
This could look like the following at the level of different stakeholders in an institution:

Creating a culture that encourages help and accepts failure



Adopting a startup mentality to foster innovation and agility

Provide independence and non-interference in functioning of top-faculty in executive positions within the institution. Leadership should have flexibility and accountability in the long term



The faculty-in-charge of such initiatives should have a string business acumen along with technological understanding. Along with that, regular industry executives in advisory roles help sharpen the impact of intervention

The process of research translation is usually not linear and requires dedicated efforts and resources. Therefore strong and consistent vision coupled with passion of the leadership is crucial in setting up systems for research translation

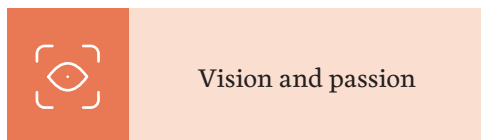


Figure 22: Characteristics of leadership for a successful research translation ecosystem at an academic institution



Faculty

The focus should be on changing the orientation of faculty members from just research to technology commercialization.

- Setting up of an Intellectual Property (IP) Cell along with clear guidelines and policy for IP and incubation.
- Incentives, flexibility, or policy support to encourage faculty and students to pursue translational research (e.g., faculty promotions include commercialization metrics, generous sabbaticals).
- Faculty/student perception of commercialization as a core institutional mission.
- Early success stories of researchers become role models for others to pursue commercialization.

Students

- At an undergraduate level, the emphasis should be on increasing the exposure of students to high quality research and creating a pipeline of potential researchers for the future.
- This could happen through more research internships, potential research associates positions in the institution, flexibility in selection of courses.
- Building a culture of research oriented towards commercialization from a very early stage.

Some elements of such leadership, faculty and student models were seen across all the eight institutions studied as part of this report. Institutions that stood out in certain aspects include the strong leadership and culture set at IITMRP, aggressive and ecosystem focused founders at CCAMP, early faculty entrepreneurship success stories that acted as role models at IISc Bangalore and models for enhancing participation in research at an undergraduate level at BITS Pilani and IIIT Hyderabad.

While attempting to work on all the above factors, it is important to remember that success often builds upon itself. Luck and serendipity can change the course of success for an institution and a couple of right decisions at the right time can open up more opportunities. Most of the institutions mentioned above have succeeded through a combination of design and accident but one thing that is common across all of them is that they dared to take the first step.





Barriers



Common bottlenecks that limit research commercialization in academic institutions.

1. Faculty-level challenges

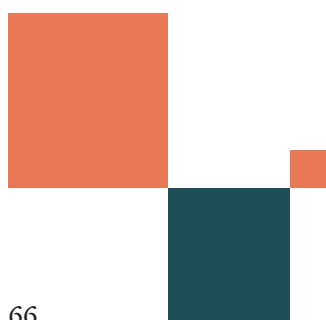
Faculty are usually open to supporting and mentoring student startups but lack the motivation and time for starting their own company. They already have a fixed source of income so the drive for anything additional is usually limited. Most of them are trained for research and teaching and lack a product mindset. Interdisciplinary demands of commercialization (e.g., business development, branding, regulatory knowledge) are outside faculty expertise.

2. Lack of contract manufacturing facilities (CMFs)

Leveraging specialized contract manufacturing facilities can significantly reduce the time taken from prototype to producing pilot batches—a critical step before commercialization. In the US and Europe there are private companies that do contract manufacturing, which is still very limited in India. Contract manufacturers compliant with GMP, ISO, or CE standards are essential for products, especially in biotech, pharma, or medical devices. Their absence means labs must wait or scramble to partner with distant or costly facilities overseas. Industry tends to avoid projects lacking clear plans for scale-up. Without onshore CMFs, investors see high risk and low return, especially since many academic patents “gather dust” without manufacturing pathways.

3. Low industry interest and confidence

Industry is reluctant to invest in academic R&D projects, fearing minimal returns after two to three years. Traditionally, the government provides incentives in the form of funding for collaborative research to institutions. There is an absence of mechanisms to de-risk industry investment, unlike models in countries like Germany where both academia and industry are funded jointly by the government. Shortage of R&D personnel in industry with the skill sets needed to absorb or co-develop academic technologies is also a limiting factor.





4. Institutional orientation and vision

Short tenures of institutional leaders (e.g., directors) result in a lack of long-term vision and continuity for innovation and commercialization strategies. Without a sustained push or policy framework, the efforts for translational research become sporadic and dependent on the interest of directors and heads of institutions. Additionally, some institutions (e.g., IISERs) have a strong basic research orientation and less historical emphasis on engineering or product development, unlike IITs. This affects the institutional culture, readiness and availability of resources for industry collaboration or startup creation.

5. Staff talent and capability in institutions

Technologies often fail to reach potential industry users due to weak marketing, limited networking with industry, and the absence of strategic commercialization planning. Most TTOs or IP Cells are staffed by scientists or administrators—not professionals with business development, sectoral marketing, or licensing experience. Without teams that can proactively identify the right market, speak to industry in their language, and actively build relationships, tech transfer efforts remain reactive and underperforming.

6. Funding gaps for deep tech

Deep tech requires time and patience, and the Indian ecosystem may not readily support long gestation periods. Venture capitalists often prefer quick returns making it challenging for deep tech startups to secure funding. Government or large corporate-backed funding may be more viable at early stages.





Recommendations and Next Steps



Recommendations

1. Facilitate pairing and linkage of a basic science institution with an institution focused on research translation

Pairing of two institutions, with one focused on basic science research and another institution focused on commercialization will enable a mutually beneficial partnership. Instituting clear policies for the transfer of technologies between the two institutions will make it easier to create spin-offs from the research done by the basic science institution. An example of this is the partnership between NCL Pune and Venture Center, as well as NCBS and C-CAMP.

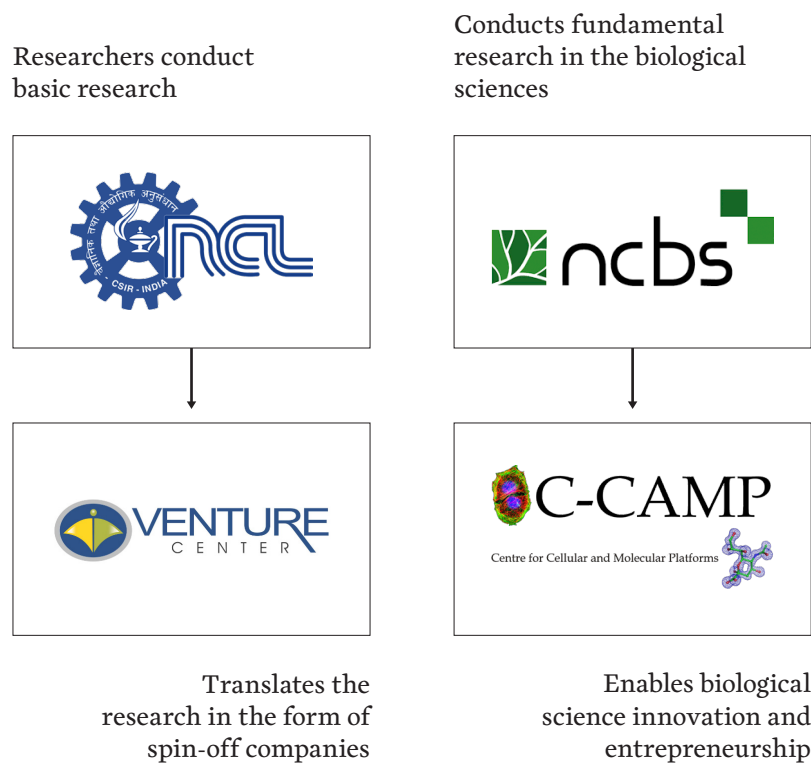


Figure 23: The relationship between NCL and Venture Center, and NCBS and C-CAMP

2. Institute a dedicated team of translation scientists and industry liaison officers

Establish a dedicated team that would focus exclusively on translation, and help research done at the institute bypass the Valley of Death and increase the likelihood of their successful commercialization. Translation scientists should have the specific skill sets required to bridge the gap between academic research (TRL 4-5) at the institute and industry requirements (TRL 7-9). Details on translation scientists and their job description can be found in Annexure 3.

Industry liaison officers will also be required to complement the efforts of the translation scientists by actively engaging with industry and identifying their requirements. The primary purpose of this team is to understand the needs of industry, find innovative solutions for how current research can be transformed to fill the gaps, and coordinate clearly with the team of translation scientists to understand the possibilities and limitations of the research. An example of such teams is seen in the Discovery to Innovation Accelerator of C-CAMP and Product Labs of IIIT Hyderabad.

3. Institutions should publish their translation outcome data transparently and publicly

While many institutions already publish data related to patents and publications, there remains a lack of consistency and comprehensiveness in what is reported. Disaggregated data on industry-sponsored projects, funding and income received from industry, and faculty involvement in entrepreneurial activities should be made publicly available. Doing so would enable institutions to benchmark their progress, foster greater accountability, and encourage healthy competition among peer institutions.

Additionally, metrics for translational research outcomes related to industry engagement, deep-tech startups, and technology transfer should be considered for NIRF rankings.

4. Pairing researchers with business co-founders for deep tech startups

Commercializing high potential IPs through deep-tech startups can be a daunting process for researchers as it requires the skills and know-how around marketing, sales and overall business strategy. Pairing a researcher with a business co-founder can complement the technical expertise of the scientist with business know-how. Team formation is the most critical aspect of building any startup, so a bespoke service model where the business co-founder and other team members can be matched with the researchers, with flexibility in terms of equity allocation can encourage researchers to kickstart their ventures. Such a model was observed in the Project Titanium Program at SINE, IIT Bombay.

5. Create domain-specific regional R&D clusters

Create domain-specific clusters similar to the Bengaluru Life Science Cluster (NCBS, inSTEM, TIGS, C-CAMP model). Concentrate efforts of a domain in a certain region of India (e.g. semiconductor manufacturing in North India or biotech and life sciences in Bangalore). An institution with expertise and strength in a certain domain can be used as an anchor to create an ecosystem of academia and industry collaboration around it. This will enable industry and academia to co-exist and collaborate organically due to their proximity to each other. This can be seen with the strong corporate pharmaceutical presence in Ahmedabad and Mumbai due to notable pharma institutions such as L.M. College of Pharmacy, Ahmedabad and Bombay College of Pharmacy.

Figure 2:
The Bangalore Life Science Cluster



6. Establish contract manufacturing facilities to provide institutions and industry with critical scale-up infrastructure

Institutions and corporations - particularly Small and Medium Enterprises (SMEs) - lack the capital and infrastructure to scale up through their independent R&D and manufacturing facilities. Providing them with contract manufacturing facilities (CMFs) and shared R&D infrastructure will allow them to develop and prototype new products at a scale not possible otherwise. It also reduces their risk and time-to-market, thereby easing the process of translating innovations.

7. Have a long-term vision and strategy for improving research translation outcomes in the institution

A clear, long-term institutional vision for research translation is essential. Most Directors and Deans have a limited tenure, which in the absence of a long-term vision, can make it difficult to sustain interventions for research translation. Aligning incentives for Deans and HoDs to increase translation outcomes along with long-term institutional goals can lead to sustained progress. For example, our study found that the current licensing revenue at top S&T Indian institutions is very low. There is a need to focus on increasing the licensing revenue to enable the institutions to be partially self-sustainable, rather than only relying on external funding and grants.

8. Provide training and mentorship for faculty on aspects of commercialization

Hand-holding and training for innovators to bridge the gap between TRL stages is required. There is an acute lack of mentorship and guidance for faculty with respect to the steps needed for commercialization of their research.



9. Targeted incentives for faculty with respect to commercialization

There should be institutional policies that incentivise and reward faculty entrepreneurship at institutions. However, broad incentives could lead to unintended consequences such as the creation of shell companies. Targeted incentives for significant funding, rather than imposing rules and regulations, could be a more effective strategy. For instance, the Verticals-enabling Intelligent Network Systems (VINES) program jointly announced by MeitY and NSF seeks to support use-inspired fundamental research. The conditions for the funding mandate that the researcher get an industry partner who funds 10% of the total project outlay.

10. Institute different tracks for faculty – where faculty can focus on either entrepreneurship, research, or teaching

Different tracks could be offered to faculty based on their interest and priorities. For example, a faculty interested in research could opt for a research track which would limit their teaching load and give them more time to work on their research and commercialization. Notably, BITS Pilani is working towards such a model. A faculty associated with a Centre of Excellence has their main focus as conducting research rather than teaching.





Next steps

This study aimed to showcase the range of initiatives undertaken by academic and research institutions in India to promote research translation. Additionally, the report laid out the core enablers and best practices that are essential for an institution to create a suitable environment for research translation, with notable examples from the institutions studied.

Going forward, FAST India will undertake a Global Benchmarking exercise to study international best practices and successful models of research translation. The goal is to identify key insights and lessons that can inform and strengthen India's own approach. Following this, FAST will develop a Translational Research Index which ranks the translation output of an institution, with the hope that it encourages healthy competition among research and academic institutions in India.



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Annexure 1:

About the institutions selected as part of this study

1. **Birla Institute of Technology and Science (BITS) Pilani**

It was founded in 1964 as a private university and now operates as a deemed university under Section 3 of the University Grants Commissions (UGC) Act and has four campuses—Pilani (Rajasthan), Goa, Hyderabad, and Dubai. BITS Pilani is known for its rigorous academic programs, flexible course structure, and emphasis on student-led research and entrepreneurship. The university offers undergraduate, postgraduate, and PhD programs in engineering, sciences, pharmacy, and management. It has 20000+ students, 2065+ PhD students and 1029+ faculty members². It ranked #23 in NIRF 2024.

2. **Centre for Cellular and Molecular Platforms (C-CAMP)**

Established in 2009, C-CAMP is a Department of Biotechnology supported not-for-profit company incubated at the National Centre for Biological Sciences (NCBS) in Bangalore, aiming to promote research translation and commercialization in life sciences. Together with the NCBS and the Institute for Stem Cell Science and Regenerative Medicine (inStem), it makes up the Bangalore Life Sciences Cluster (BLiSC). C-CAMP provides shared technologies in genomics, proteomics, imaging, cell-based assays, microfluidics, etc., and supports biotech startup incubation. Its mandate is catalyzing

bioscience research and entrepreneurship, backed by seed funding, mentorship and bio-incubator infrastructure.

3. **International Institute of Information Technology Hyderabad (IIIT-H)**

IIIT-H, established in 1998 as the first not-for-profit public-private partnership IIIT, is an autonomous accredited deemed university. It focuses on advanced research in computer science, electronics, smart cities, AI, language technologies, and more, with over 20 major research centers. It positions itself as primarily a research institution that also teaches, with a flat organizational structure centered around research centers, facilitating interdisciplinary collaboration. The curriculum includes research-oriented courses even at the undergraduate level, and a research honors program allows students to deeply engage with research labs. It has a student strength of 2374+ with 105+ faculty members³.

4. **Indian Institute of Science (IISc) Bangalore**

Founded in 1909 through the joint efforts of Jamsetji Tata, the Maharaja of Mysore, and the Government of India, IISc stands as one of India's oldest premier research universities. It is a deemed university under the University Grants Commission. Its research covers all major physical, chemical, biological and mathematical sciences, engineering and

² Source: BITS Pilani

³ Source: IIIT Hyderabad website

interdisciplinary areas. Research constitutes the core of its academic mission: research students constitute the largest group on the campus (more than 70% of the student body) with around 400 new PhD researchers admitted annually across approximately 40 disciplines. Student strength exceeds 4500 across undergraduate and postgraduate programmes, supported by approximately 500 faculty⁴. It ranked #2 in NIRF 2024 and #219 in QS World University Rankings 2026.

5. Indian Institute of Technology (IIT) Bombay

IIT Bombay, established in 1958, is governed under the Institutes of Technology Act. With over 700 full time faculty members, 3500+ PhD students, 3300+ masters students and 6000+ undergraduate, research at IIT Bombay is wide-ranging—science, engineering, and management⁵. It ranked #3 in NIRF 2024 and #129 in QS World University Rankings 2026.

6. Indian Institute of Technology (IIT) Delhi

Founded in 1961 as the College of Engineering and designated as an Institute of National Importance in 1963, IIT Delhi functions as an autonomous statutory organization under the Institutes of Technology Act. It offers comprehensive research in engineering, science, management, and humanities. It currently has 12000+ students on roll and 670 faculty members⁶. It ranked #4 in NIRF 2024 and #123 in QS World University Rankings 2026.

7. Indian Institute of Technology (IIT) Madras

Established in 1959 as one of the first IITs, IIT Madras operates as an autonomous statutory organization under the Institutes of Technology Act. It comprises 18 departments and numerous research centers, covering engineering, sciences, and management. The faculty strength is around 630, and total student enrollment exceeds 12,500⁷. IIT Madras is renowned for its strong industry collaboration, technology transfer through its research park, and IP commercialization efforts, hosting one of India's largest academic research parks for innovation and entrepreneurship. It ranked #1 in NIRF 2024 and #180 in QS World University Rankings 2026.

8. Venture Centre

Venture Centre is a technology business incubator hosted by the CSIR-National Chemical laboratory (NCL), Pune that aims to nucleate and nurture knowledge-intensive and innovative technology enterprises. It emphasizes inventive startups especially those offering products and services exploiting scientific expertise in the areas of materials, chemicals and biological sciences and engineering. Venture Center was incorporated as “Entrepreneurship Development Center” under Section 25 (not for profit) of the Companies Act, 1956 (now Section 8 under the Companies Act, 2013). Key components of the ecosystem include mentoring, infrastructure, access to scientific facilities of NCL, funding, information, networks, events etc.

⁴ Source: IISc Bangalore Annual Report 2023-24

⁵ Source: IIT Bombay Pocket Statistics 2023-24

⁶ Source: IIT Delhi Annual Report 2023-24

⁷ Source: IIT Madras Annual Report 2023-24

Annexure 2:

Collaboration Pathways for credit points at IIT Madras Research Park

IITM Research Park offers diverse collaboration opportunities, including joint R&D projects with IITM, Centres of Excellence, and incubated companies, along with consultancy, royalty/license fees, and co-guidance for research. RP clients can engage IITM faculty as advisors or sponsor employees for Ph.D., M.S., or MTech programs. They can also contribute to teaching, deliver guest lectures, and co-guide IITM students. Other options include joint patent filings, participation in RP 10X initiatives, pro-bono support, R&D grants, and employment pathways for IITM graduates.

Some current approaches through which the ecosystem promotes industry-academia collaboration, ensuring continuous engagement and monitoring include the following:

1. Joint R&D Project with IITM, IITM Centres of Excellence, IITMRP, IITM Incubators or IITM Incubated Companies
2. Consultancy with IITM, IITM Centres of Excellence or IITM Incubated Companies
3. Royalty/ License Fees to IITM, IITM Centres of Excellence or IITM Incubated Companies
4. Engaging IITM Faculty as an Advisor
5. RP Client Employee as Adjunct Professor, Chair Professor or Professor of Practice at IITM
6. Sponsoring Employee for PhD at IITM
7. Sponsoring Employee for MS/ MTech at IITM
8. RP Client engaged in Teaching activities/ delivering guest lectures at IITM
9. RP Client providing Joint PhD Co-Guidance at IITM
10. RP Client providing Joint MS Co-Guidance at IITM
11. RP Client providing Joint MTech Co-Guidance at IITM
12. RP Client providing Joint BTech/MSc Guidance at IITM
13. Joint Patent Filed as part of Collaborative Projects with IITM Faculty (Domestic or Global)
14. Joint Patent Granted as part of Collaborative Projects with IITM Faculty (Domestic or Global)
15. RP Clients involved in RP 10X Initiatives
16. IITM Faculty as Advisor, compensated via RP Client Company stock
17. Pro-bono support from RP Clients for IITM Projects funded by IITM or External Agencies
18. R&D Grants made to IITM, IITMRP, IITM Centres of Excellence, IITM Incubators or IITM Incubated Companies for non-Joint-R&D Projects. (Grants could come from CSR)
19. Full-Time Employment for IITM BTech Graduates of IITM - Campus Hire

20. Full-Time Employment for IITM MS/ MTech Graduates of IITM - Campus Hire
 21. Full-Time Employment for PhD Scholars of IITM - Campus Hire
 22. Part time Employment or Internships for BTech/ MTech/ M.A/ MSc students of IITM
 23. Part time Employment or Internships for MS/ PhD Students including Dual Degree Students/ Scholars of IITM
 24. RP Client Employee sponsored for Continuing Education at IITM; Participating in Training Sessions conducted by IITM Faculty, IITM Centres of Excellence or IITM Incubated Companies
 25. IITM Faculty delivering Lecture to RP Client Employees
 26. RP Client Sponsoring National/ International Technical Events at IITM or IITM RP involving Faculty and Scientists
 27. RP Client Sponsoring Student Technical Events at IITM
 28. Non-Research Grants (Grants could come from CSR) made to IITM, IITMRP, IITM Centres of Excellence, IITM Incubators or IITM Incubated Companies.
- Each collaboration pathway has a certain number of credit points allocated to it which could be fixed based on the unit of measurement. For example: 200 credit points are given per ₹10 lakhs (~\$12K) paid by industry for a joint R&D project with IITM. The credit points may also be decided on a case-by-case basis by the RP Internal Committee (RPIC). This approach is constantly updated to meet evolving demands.

Annexure 3:

The role of a translation scientist

One of the recommendations of this study is for institutions to form a team of **translation scientists**. This is a model that can be found in the Discovery to Innovation Accelerator at C-CAMP, as well as in the Product Labs at IIIT-H.

Who is a translation scientist?

A translation scientist is a researcher whose role is to convert the basic research conducted by other researchers to real-world applications. A translation scientist's goal is not just to produce publications at top scientific journals, but rather to bring research that may be at a TRL 3-4 level up to a level where industry is ready to adopt it.

Why is a team of translation scientists needed?

The interests and goals of researchers working at research institutions do not always align with translation. They might want to work on fundamental research problems that appeal to them, which may also align with their goal of publishing in top scientific journals. Instead of steering researchers toward translational work that may not align with their interests or ambitions, establishing a separate team of scientists dedicated to translation could be a more effective and sustainable approach.

What are the skills that a translation scientist needs?

While the technical skills of a translation scientist do not differ greatly from a typical researcher, a translation scientist should have the mindset required for translation. They should be able to think creatively about how the science they're presented with could be applied. They should have an understanding of how the science can be tweaked to cater to industry's specific needs. The translation scientist should also be adaptable and willing to work on a wide range of research problems. As there would be multiple projects that the team would have to work on, the translation scientist should have a wide breadth of knowledge and a willingness to dive into new areas of research.

What is the cost of keeping a team of translation scientists?

While the cost would greatly depend on the size of the team and research interests of the institution, an estimate arrived at through our consultations is INR 2 crores to fund a team of 15 translation scientists of varying work experience.

Example of a job posted by C-CAMP

Profile:

C-CAMP is looking for a self-driven, highly motivated, pro-active individual, capable of working independently and as a part of the team, for the following positions:

Two positions are available at the Discovery to Innovation Accelerator (DIA), C-CAMP, based on the mentioned experience;

1. Post-Doctoral Translation Scientist – 1 position
2. Translation Scientist – 1 position

Roles and Responsibilities:

- Designing and executing Translational research projects and protocols for different Discovery to Innovation Accelerator (DIA) projects.
 - a. Perform experiments, collect and analyze data.
 - b. Maintain an accurate record of all the experiments and provide ready access to all data to the reporting authority.
 - c. Conduct literature reviews as per the requirement of the projects.
 - d. Participate in project meetings, seminars, Laboratory meetings and other lab activities.
 - e. Maintain confidentiality of the project, workflow.
 - f. Prepare detailed progress report, presentation and other articles for reporting authority.
- Collaborating and complementing a larger team of professionals, working on existing projects at DIA and other members at C-CAMP.
- Travelling occasionally as per project requirements.
- Undertaking relevant training on additional techniques required for project execution and subsequently training the team.

Qualification:

- Post-Doctoral Translation Scientist position: 0 – 2 years' Postdoctoral or industry experience
- Translation Scientist position: > 2 years of Postdoctoral or industry experience
- PhD in any discipline of Life-sciences or Engineering (with interdisciplinary work in life-science).

Experience:

- A strong track record of publications/patents.
- Exceptional candidates who have submitted thesis towards grant of PhD will be considered for Translation Postdoctoral positions.
- Candidates with any national level fellowship certificates (e.g.; CSIR-JRF, UGC-JRF, GATE, DBT-JRF, ICMR-JRF, etc) will be given preference.
- Candidates with experience in healthcare and agricultural applications are preferred.
- Demonstrable understanding of Intellectual property management and commercialization is desirable.



Application Deadline: **30th**
Sep
2024

We Are
HIRING

Translation Scientist-1
Post-Doctoral Translation Scientist-1

Send CV, cover letter to hr@ccamp.res.in
(Indicate position in subject line)

Fill Assessment Form (mandatory): <https://tinyurl.com/ytfm4cdn>

Details: <https://www.ccamp.res.in/careers>



“Technology diffusion to reach a product is a fragile, non-linear process, yet central to building use cases, competitive advantage, achieving impact and productivity. We need to continuously identify and invest in areas of fragility, support them and provide various pathways. All the models identified in the playbook are going to be quite helpful there.”

Dr. Shivkumar Kalyanaraman

CEO, Anusandhan National Research Foundation (ANRF)
Government of India

“It is imperative that more translation happens in India. However there are different strategies that can be employed. This report provides a playbook on how to approach this compliance problem. It will be a good base on which more models are created.”

Mirik Gogri

Principal
Spectrum Impact

“India has no dearth of scientific talent - what we essentially need is a stronger push from lab to market. This playbook is an important contribution, showcasing institutional models, policy enablers, and cultural shifts that can help us scale translational research and unlock the next wave of deep-tech innovation.”

Dr. Vivek Singh

Senior Advisor (S&T), NITI Aayog
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