



Department of Biotechnology
Ministry of Science and Technology
Government of India

**Implementation Plan for Biomanufacturing and Biofoundry component of the BioRIDE
scheme of Department of Biotechnology for
*'Fostering High-Performance Biomanufacturing'***

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1. Background

Bharat is on a transformative journey to harness the immense potential of *biomanufacturing* to offer sustainable solutions to pressing global challenges, including climate change and unsustainable resource consumption. By leveraging the regenerative capabilities of biological systems, biomanufacturing can drive innovation across various sectors, contributing to the vision of a sustainable and prosperous *Viksit Bharat*.

Biomanufacturing enables the production of a diverse range of high-value, bio-based products, such as chemicals, enzymes, biopolymers, regenerative medicines, and other bio-based products. Additionally, it supports plant growth, crop protection, green industrial processes, reduced carbon emissions, carbon capture, and the substitution of non-renewable resources. These advancements will be critical in moving India towards a sustainable and innovative future.

However, a significant barrier to realizing this potential is the limited domestic capacity to translate research breakthroughs into commercially viable bio-based products. The transition from the lab to the market is often hindered by the lack of infrastructure required for scaling innovations from pilot projects to pre-commercial manufacturing. Consequently, many startups and small-to-medium enterprises (SMEs) are unable to progress beyond the proof-of-concept stage within incubation centers or laboratories.

Globally, this gap has been addressed through public-sector investments in infrastructure and capacity building. Countries that have successfully developed biomanufacturing ecosystems have done so by establishing biotech infrastructure and funding pipelines for innovative projects. These efforts, coupled with conducive public-private partnership (PPP) policies, have created vibrant local ecosystems that sustain themselves over time.

To enable bio-innovation and build a thriving biomanufacturing sector in India, it is imperative to focus on developing advanced tools and technologies while setting up shared pilot and pre-commercial manufacturing facilities. These resources will be crucial for researchers, startups, SMEs, and industries, ensuring the translation of cutting-edge research and development (R&D) into commercially viable bio-based products.

2. The Implementation Plan

To realize this vision, the Department of Biotechnology (DBT), Government of India, has developed an Implementation Plan under the BioRIDE scheme for *Fostering High-Performance Biomanufacturing*. This strategic roadmap outlines six thematic sectors that will drive India's biomanufacturing revolution:

1. **Bio-based chemicals and enzymes**
2. **Functional food and smart proteins**
3. **Precision biotherapeutics**
4. **Climate-resilient agriculture**
5. **Carbon capture and it's Utilization**
6. **Futuristic marine and space research**

At the heart of this initiative are the **DBT-BIRAC 'मूल कुरु' BioEnablers**, a network of cutting-edge *Bio-Artificial Intelligence Hubs*, *Biofoundries*, and *Biomanufacturing Hubs*. These cross-cutting technology platforms will act as the backbone for innovation, empowering all six thematic sectors and accelerating India's progress toward becoming a global biomanufacturing leader.

By fostering collaboration between the public and private sectors, establishing world-class infrastructure, and nurturing innovation ecosystems, India is poised to unlock the full potential of biomanufacturing. This will not only address pressing global challenges but also propel India into a leadership role in the bioeconomy, supporting sustainable growth and employment for decades to come.

3. Objective:

To create, nurture and foster high-performance biomanufacturing ecosystem for discovery and innovative research and bridging the gap between '*lab-to-pilot*' and '*pre-commercial*' scale manufacturing of commercially viable bio-based products. This will:

- 3.1 Foster discovery and innovative research to develop commercially viable bio-based products;
- 3.2 Enable Startups, SMEs, industries and academia with access to shared infrastructure/facilities and resources for pilot and pre-commercial scale biomanufacturing of viable commercial bio-based products;
- 3.3 Provide otherwise missing exposure and access to process development & optimization, pilot & pre-commercial scale testing, and validation facilities;

- 3.4 Enable nucleation of stakeholder engagements such as Industries, Private investors, Regulators, Service Providers, Global talents, required to yield a globally competitive innovation ecosystem;
- 3.5 Build local vendors and supply chain, strengthen mentorship; attract private investments to expand state of art infrastructure footprint in a public-private partnership (PPP) mode;
- 3.6 Impart forward pull to scalability and sustainability of bio-entrepreneurial system;
- 3.7 Provide training and internship for building human resources with the required interdisciplinary, cross functional technical skills to foster biomanufacturing.

4. Implementation:

The implementation of the **Biomanufacturing** and **Biofoundries component** will be led by the Department of Biotechnology (DBT), which will provide support to academia, while the **Biotechnology Industry Research Assistance Council (BIRAC)** will cater to start ups, SMEs, industries and their academic collaborators. This collaboration aims to accelerate innovative research, pilot-scale production, and pre-commercial manufacturing of commercially viable bio-based products. Other relevant organizations may also be included in the future to enhance the speed, efficiency, and breadth of implementation, as well as to provide necessary business support services.

Under this call, the **Biomanufacturing and Biofoundry Components** will be implemented under two categories:

- 1. Discovery and Application-oriented Integrated Network Research**
- 2. Bridging the Gap for Scale up**

4.1 Discovery and Application-oriented Integrated Network Research

In this category, targeted R&D projects will be supported, whether from individual researchers or teams of investigators from academia, Startups, SMEs and Industry. Network projects or Centers of Excellence will also be encouraged to develop *proof-of-concept* technologies through competitive proposal calls under the six thematic sectors. The goal is to foster cutting-edge innovation that drives forward technological development.

4.2 Bridging the Gap for Scale up

Under this category, individual researchers, collaborative projects, network projects, including Centres of Excellence, will receive support to early scale-up of bio-based technologies or products that have already achieved a *proof-of-concept*. The projects will

target startups, SMEs, industries, and academia, enabling them to move from laboratory prototypes to pilot-scale production.

5. Funding Mechanisms:

The Funding mechanisms for the two categories i.e. (i) **Discovery and Application-oriented Integrated Network Research** and (ii) **Bridging the Gap for Scale up** are provided below:

S.No	Category	Funding Mechanism
I. Discovery and Application oriented Integrated Network Research		
A.	Funding to Startups , SMEs and Industry <i>(The Startup should not be simultaneously in receipt of any grant from other Departments/Ministries funding start-ups including BIG grant of BIRAC for the same project)</i>	<ul style="list-style-type: none"> Upto ₹ 50 lakhs funding through Grant-in-aid
B.	Funding to Academia	<p>Funding through Grant-in-aid as per the “Extramural Research (EMR) Guidelines of DBT. The maximum budgetary limit for the proposals (to be received under the call) will be</p> <ul style="list-style-type: none"> ₹2.5 Crore (single –institute projects), ₹5 Crore (collaborative projects), and ₹10 Crore (network projects including Centres of Excellence) <p>Private Universities/ NGOs/ Trusts/ foundations etc. will be encouraged to share 25% of capital investment cost</p>
II. Bridging the Gap for Scale up		
A.	Funding to Startups, SMEs, and industry <i>(The Startup should not be simultaneously in receipt of any grant from other</i>	<ul style="list-style-type: none"> Up to ₹ 50 lakhs funding through Grant-in-aid

	<i>Departments/Ministries funding start-ups including BIG grant of BIRAC for the same project)</i>	
B.	Funding to Startups, SMEs, and industry (beyond ₹ 50 lakhs)	<p>Financial Assistance through ‘Co-funding’ and royalty sharing/equity financing in the following manner:</p> <ul style="list-style-type: none"> • For start-ups, SMEs and Industry applicants funding through ‘Co-funding’ would involve the cost sharing of a minimum of 30% of total project cost by the grantee organisation in cash excluding land and construction costs. • For joint Industry-academia projects minimum 30% of the cost of the Industry component will be shared by the Industry. • Following feasibility assessment, due weightage will be given to the company that will bring best value to the Government in terms of maximum percentage of cash contribution and having an upscaled technology. <p>‘Royalty Sharing’ would involve payment of royalty on Net sales of the product developed. Payment of 5% royalty of the Net sales (defined as ex-factory price of the product minus any sales commissions or discounts and does not include freight or insurance costs) till the grant-in-aid amount is paid off to BIRAC. The liability to pay royalty will terminate upon the first of any of the following events to occur:</p> <p>a) 5% royalty paid to BIRAC till the royalty amount paid becomes equal to the amount of the Grant-In-Aid disbursed and that was not returned to BIRAC as</p>

		<p>unutilized funds or</p> <p>b) in case of foreclosure or termination of project as per terms of Grant-in-aid letter agreement (GLA)</p> <p>c) Event such as technology or product out licensing/company merger or acquisition, a one-time payment, from the transaction deal, of up to an amount equivalent to the funds received by applicant.</p> <p>Funding through 'Equity financing' would involve taking equity stake through Convertible notes that gets compulsory converted at valuation of the first investment round raised by the grantee of ₹10 Cr or more within 5 years period; or mandatorily at the end of 5th year at a 20% discount of the latest valuation. Equity share will be based on the quantum of funding given to the project. Equity funding may be considered as per the discretion of the committee on a case-to-case basis.</p>
C.	Funding to Academia	<p>Funding through <i>Grant-in-aid</i> to Mission Mode projects <i>as per DBT EMR Guidelines</i></p> <p>Private Universities/ NGOs/ Trusts/ foundations etc. will be encouraged to share 25% of capital investment cost</p>

The condition of grantees being debarred from receiving any grants in future from the DBT/BIRAC in case of failure to adhere to the terms and conditions of the grant agreement shall be incorporated in the grant agreement and this shall be mentioned in the call for proposals guidelines.

6. Eligible Organisations/Beneficiaries:

The applicant seeking support from BIRAC should:

- be a legal entity (for profit/not-for-profit entities), registered in India with taxation and other administrative authorities.
- have prior experience in the applied area of Bio-services/Biomanufacturing. Details regarding Bio-services/Biomanufacturing shall be clearly specified in the proposal.

- c. not be blacklisted by any Central/ State Government/Public Sector Undertaking, Govt. of India.
- d. Major promoter(s) or the legal entity not involved in any major litigation that may have an impact of affecting or compromising delivery of assigned projects.
- e. Adhere to the Policies of DBT and BIRAC on data protection, confidentiality & conflict of interest.
- f. Startups/SMEs/Industry: applicant should be an Indian legal entity with a minimum 51% stake is owned and controlled by resident Indian citizens.

The Academia proposals will be supported as per the DBT norms.

7. Expected Outcomes: The anticipated outcomes include:

- a. *Accelerated Transition to Scale:* Enhanced lab-to-pilot and pre-commercial scale manufacturing of bio-based products by startups, SMEs, industries, and academic institutions.
- b. *Increased Visibility for Indigenous Products:* Greater visibility of an indigenous pipeline of high-value bio-based products, attracting subsequent private investments and fostering a robust market presence.
- c. *Development of a Skilled Workforce:* An expanded cohort of highly skilled professionals in India, leading to increased employment opportunities and heightened entrepreneurial momentum.
- d. *Strengthened Local Market:* A range of Made-in-India bio-based products entering the market, bolstering local logistics and vendor networks while reducing reliance on imports and non-renewable resources.
- e. *Maturation of the Biotech Innovation Ecosystem:* The development of a thriving biotech innovation ecosystem in the country, contributing to the vision of establishing India as a Biomanufacturing hub.