Request For Proposal

for supporting

Development, validation & pre-commercialization of products/technologies

under

Challenge Call

of

i4 (BIPP & SBIRI) and PACE (AIR & CRS)

from

Industry and Academia

Last date of Proposal Submission: 31st July 2023 (up to 5:30 pm)

बाइरैक
इग्नाइट इनोवेट इंक्यूबैट

birac
Ignite Innovate Incubate

जैव प्रौद्योगिकी उद्योग अनुसंधान सहायता परिषद
(भारत सरकार का उपक्रम)
Biotechnology Industry Research Assistance Council
(A Govt. of India Enterprise)

REQUEST FOR PROPOSAL

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Development, validation & pre-commercialization of products/technologies

under

i4 (BIPP & SBIRI) and PACE (AIR & CRS)

from

Industry and Academia

Under the present call of i4 and PACE schemes, proposals are invited only in areas aligned to Priority Areas in following fields:

- **Devices and Diagnostics**
- **Vaccines**
- **Drugs and Biotherapeutics**
- **Agriculture, Veterinary Sciences and Aquaculture**
- **Energy, Environment and Secondary Agriculture**

Areas that will be considered under the present call are as follows**:**

Devices and Diagnostics

- Import substitution of high-end medical equipment, raw materials, consumables, disposables in the area of radiology and imaging, cancer care devices, anaesthetics devices and implants.
- Additive manufacturing or three-dimensional (3D) bioprinting of biocompatible materials, cells, polymers and other components into complex 3D functional living tissues including multi-layered skin, organs, bone, heart tissue, vascular grafts and cartilaginous structures
- Development and use of liquid metal biomaterials including Gallium and gallium-based alloys, liquid metal nano-particles (LMNPs) for diagnostic applications (bioimaging to biosensors).
- Carbon Quantum Dots (CQDs) for biomedical applications like bioimaging, biosensing, electrochemical biosensing, fluorescent and luminescent imaging and photodynamic therapy.
- Digital Health and Telemedicine solutions using Artificial Intelligence (AI) and machine learning (ML) tools

- Robotics in Healthcare: Surgical assistance, sanitation and disinfection, rehabilitation, robots enabling lab automation & robotic exoskeletons.
- Smart assistive devices for disabled and geriatric population
- Diagnostics for Haemoglobinopathies, Lymphatic filariasis and Dementia

Vaccines

- Development of new and improved vaccine candidates for viral pathogens (excluding Corona and related) based on emerging Platforms.
- Development of safe and effective nano vaccines for emerging communicable and non-communicable diseases
- Development of safe and novel adjuvants
- Vaccines for sexually transmitted diseases (STDs) and nosocomial infections.

Drugs and Biotherapeutics

- Advanced Therapy Medicinal Products (ATMPs)
- Drugs and therapeutics for Neglected Tropical Diseases *(Refer Global report on neglected tropical diseases 2023 by WHO for diseases included as NTD's),* Rare genetic disorders, Haemoglobinopathies
- Repurposing of drugs
- Host directed therapies
- Development of new methods/technologies of drug delivery (e.g., nanocrystalline solid dispersion, drug polymer/peptide conjugate, enabling technologies to improve oral bioavailability), complex generics.
- Personalized medicine
- New chemical entities for life-style diseases

Agriculture/Plant Science

- Innovative technologies for increasing water use efficiency (Smart irrigation)
- Application of Digitally enabled/Disruptive technologies e.g., Sensors, IoT, 3D printing, Robotics, AI/ Machine learning, UAV/Drones, GIS, GPS, Remote sensing for smart agriculture and disease management
- Soil and Plant health management through rapid, specific and low-cost diagnostic kits for on-site detection of various plant diseases caused by bacteria, fungi, viruses, nematodes, etc. to minimize production losses
- Farm mechanization & automation
- Development of processes/technologies for enhancing the productivity of oilseeds, pulses and millets

- Gene editing technologies (SDN – 1 & SDN – 2) to improve traits like yield, quality, disease resistance, tolerance to biotic and abiotic stress etc. in crops
- Smart pest management using Nano sensors, Nano-pesticides, pheromone, etc.
- Development of DNA probes/DNA chips/Nano sensors and other plant disease diagnostics methods
- Biologicals for plant nutrition: bacterial consortium, metabolites etc.
- Marine plants for food and pharmaceutical applications

Veterinary Sciences

Platform technologies for vaccine development for veterinary use

- Development of diagnostics for zoonotic diseases particularly point of care tests (like Brucella, FMDV, Lumpy Skin Diseases etc).
- Biotechnological interventions to improve qualitative or quantitative nutrient absorption and bioavailability for livestock productivity.
- Affordable assisted reproductive technology.
- Vaccines for Bovine viral diarrhoea (BVD), Mastitis, bovine tuberculosis etc.
- Reagents for veterinary diagnostics
- Tackling Veterinary Antimicrobial Resistance (Vet-AMR) (includes bacterial, parasitic and viral pathogens) for the purpose of improving animal health
    - Affordable, pen-side diagnostics to detect AMR on farms
    - Effective therapeutics, including alternatives

Aquaculture

- Field usable diagnostic kits for disease and algal toxins relevant to aquaculture
- Bioactive compounds from marine actinobacteria.
- Biotechnological interventions for sustainable development of shrimp farming.
- Development of farmer friendly onsite diagnostics tools and techniques for existing and emerging pathogens in Indian aquaculture system and integrated diagnostic platforms.
- Production of high value human therapeutic fish proteins using fish cell lines
- Developing sensors towards detection of fish diseases through AI.
- Alternative to antimicrobials
- Biological routes in preservation and food safety of fishes
- Development in mariculture and algaculture techniques

Energy, environment and secondary agriculture

- Valorisation of lignin to value added chemicals (biological route only)
- Biomanufacturing related areas including pathway engineering, host cell engineering, bioreactor (scale-up) and process media engineering, and active product purification (as distinct from small molecule/ regular chemical separation) for:
    - Conversion of lignocellulosic biomass into chemicals and materials
    - Production of advanced biofuels (e.g., butanol, isobutanol, alkane, alkene, terpenes)
    - Cosmetics/nutraceuticals/flavour compounds/ APIs
    - Breakdown of plastic material
    - Production of highly efficient enzymes for biomass hydrolysis
    - Production of enzymes for industrial uses
    - Biohydrogen production from biomass resources
- Value addition of medicinal and aromatic plants using advanced techniques
- Potential value-added products from post-harvest residues and processing wastes (including Bioplastics/Biocomposites from natural fibres)
- Food derived bioactive peptides
- Alternative proteins
- Customized nutrition using emerging techniques.
- Circular economy for post-harvest processing and value addition of underutilized crops in India
- Non-destructive quality evaluation, green technologies for storage and pest control, on-line sorting and grading using IoT/sensors etc.
- Post-harvest value addition of millets including:
    - Development of efficient machineries for primary processing of different types of major and minor millets, which includes dehulling, separation, etc.
    - Improvement in shelf-life for millet grains and flour
    - Emerging trends in packaging of millets and millet-based products
    - Innovative millet-based products and its nutritional profiling and bioavailability studies

Types of projects supported:

- ***Proposals submitted in research areas listed above would only be considered under the present call***
- Products/Technologies should have well established Proof of Principle for AIR and Proof of Concept for CRS proposals
- Projects proposing a process/product innovation should have significant potential impact or commercial potential

- Developed process should be sustainable from an economic and environmental point of view and should be scalable
- The Technology Readiness Level (TRL) at the end of the project should be:
    - **Minimum TRL 3** (Proof of concept established) for AIR
    - **up to TRL 6** (Early-stage validation) for SBIRI
    - **TRL 7 and above** (Late-stage validation up to pre commercialization) for BIPP

What is not supported?

- Concepts/exploratory research ideas without proper Proof-of-Principle (AIR and SBIRI) and Proof-of-Concept (CRS and BIPP)
- Proposals without preliminary data and potential for product/technology development.
- Funding cannot be used to support PhD student research or any other academic research.
- The grant is not a research fellowship

Proposals not within the scope of the present call or not supported by preliminary data in the proposed area of research would be summarily rejected

Who can apply?

PACE:

Academic Institute, University, NGO or Research Foundation, registered/ accredited by a government body can apply either alone, or in partnership with academia or industry (while involvement of industry is optional for AIR Scheme, it is mandatory to have an industrial partner for CRS)

Under the scheme, academia (Public or Private Institute, University, NGO, Research Foundation or trust/society), National research laboratories having a well-established support system for research shall be the primary applicant. The PI has to be a permanent Faculty of the applicant entity. The applicant can apply either:

1. Individually, or
2. Jointly with academic and/or industrial partner

PACE - AIR:

Eligibility Criteria for academia:

For Public or Private Institute, University, NGO, or Research Foundation, proper registration/ accreditation from a government body is mandatory like UGC affiliation certification, AICTE, CSIR /DSIR/SIRO certificate etc.

Eligibility criteria (Technical) for applicants under AIR

- PI must have completed at least one or more extramural funded project in India with cumulative project duration of 3 year & in the same research area of the project proposed. Projects must have been funded by Govt. funding agencies or Industry. Project/s executed as PI (and not as Co-PI) will only be considered to establish eligibility. Related Sanction order or funding note to be uploaded as a proof.
- PI must have authored at least one publication (not abstract) indexed in Scopus/web of science/research paper published in peer reviewed journal as first or lead author, or patents (filed) in the same research area of the project proposed for AIR*.(Conference papers and review papers will not be considered to establish eligibility)*
- Evidence of proof of principle (POP) and preliminary data, already gathered by the applicant, supporting the proposal is compulsory and must be submitted in the AIR application. Absence of which can result in disqualification of the proposal.
- A justification on how the project on completion would be CRS ready must be included. Therefore, the proposal should include the strategy for taking forward the outcomes and results towards product development with an industrial partner *(CRS scheme guidelines may be referred for further information)*
- Proposals involving agriculture should have viable product/technology as an outcome that can be considered for advanced trials by the industry/authorized national agencies.
- If the AIR proposal has industry participation, then the partnering/collaborating company/ LLP should be more than 5 years after incorporation. Applicants are encouraged to have industry partners in order to demonstrate translational strategy.
- The final technical objective/milestone of the AIR proposal should reflect technology/result that is near to industry readiness (minimum TRL-3).

PACE-CRS:

1. Academia* has to be the Primary Applicant with one or more partners of which at least one is a company**

   **For Public or Private Institute, University, NGO, or Research Foundation, proper registration/accreditation from a government body is mandatory*

   ***Participating company should be registered under the Indian Companies Act, 2013 with at least 51% Indian shareholding i.e., shares of the Company should be held by Indian Citizens holding Indian passport (Indian citizens do not include Person of Indian Origin (PIO) and Overseas Citizenship of India (OCI) holders).*

2. The applicant Company should have adequate in-house facility to address the project implementation (which shall be evaluated during the site visit) or incubated with any of the recognized incubation facility.

Eligibility criteria (Technical) for applicants under CRS

- Evidence of proof of Concept (PoC) i.e., TRL-3 and validation ready data supporting the proposal is compulsory and must be submitted in the CRS application. Absence of

which can result in disqualification of the proposal

- Proposals that have received AIR funding should have the same industrial partner who collaborated for AIR project. Any deviation must be duly justified with clarity on IP governance.
- The CRS proposal should be accompanied by the Commitment Letter by the industrial partner to exercise the first right for monetizing the product/technology

SBIRI and BIPP

Eligibility

1. The proposals can be submitted

    a) Solely by a Company* incorporated under the Companies Act, 2013 or Limited Liability Partnership (LLP)** incorporated under the Limited Liability Partnership Act, 2008 or Joint Ventures either in the form of Company/ LLP

    b) by any of the above entities jointly with other private or public partner(s) (Universities or Institutes)

** Minimum 51% of the shares of the Company should be held by Indian Citizens holding Indian passport (Indian Citizens do not include Person of Indian Origin (PIO) and Overseas Citizenship of India (OCI) holders)*

***Minimum half of the persons who subscribed their names to the LLP document as its Partners should be Indian citizens.*

2. ***The Applicant Company/LLP should either:-***

    a) Have adequate in-house facility to address the project implementation (which shall be evaluated during the site visit) or

    b) Incubated with any of the recognized Incubation Facility

3. ***For Academic collaborator:***

    Eligible Academia shall mean an entity which is having proper establishment documents:

    For Public or Private Institute, University, NGO, or Research Foundation, proper registration/ accreditation from a government body is mandatory like UGC affiliation certification, AICTE, CSIR /DSIR/SIRO certificate etc.

Ineligibility

1. Applicant who had withdrawn their proposal after approval from Apex committee or whose project was foreclosed due to inadequate funds or any other irregularity would be debarred from submitting fresh proposals for next 3 calls (1 year).

2. Proposals submitted by a company/subsidiary/sister concern either as main applicant or collaborator, who has been fund recipient in any of the schemes of BIRAC in past and

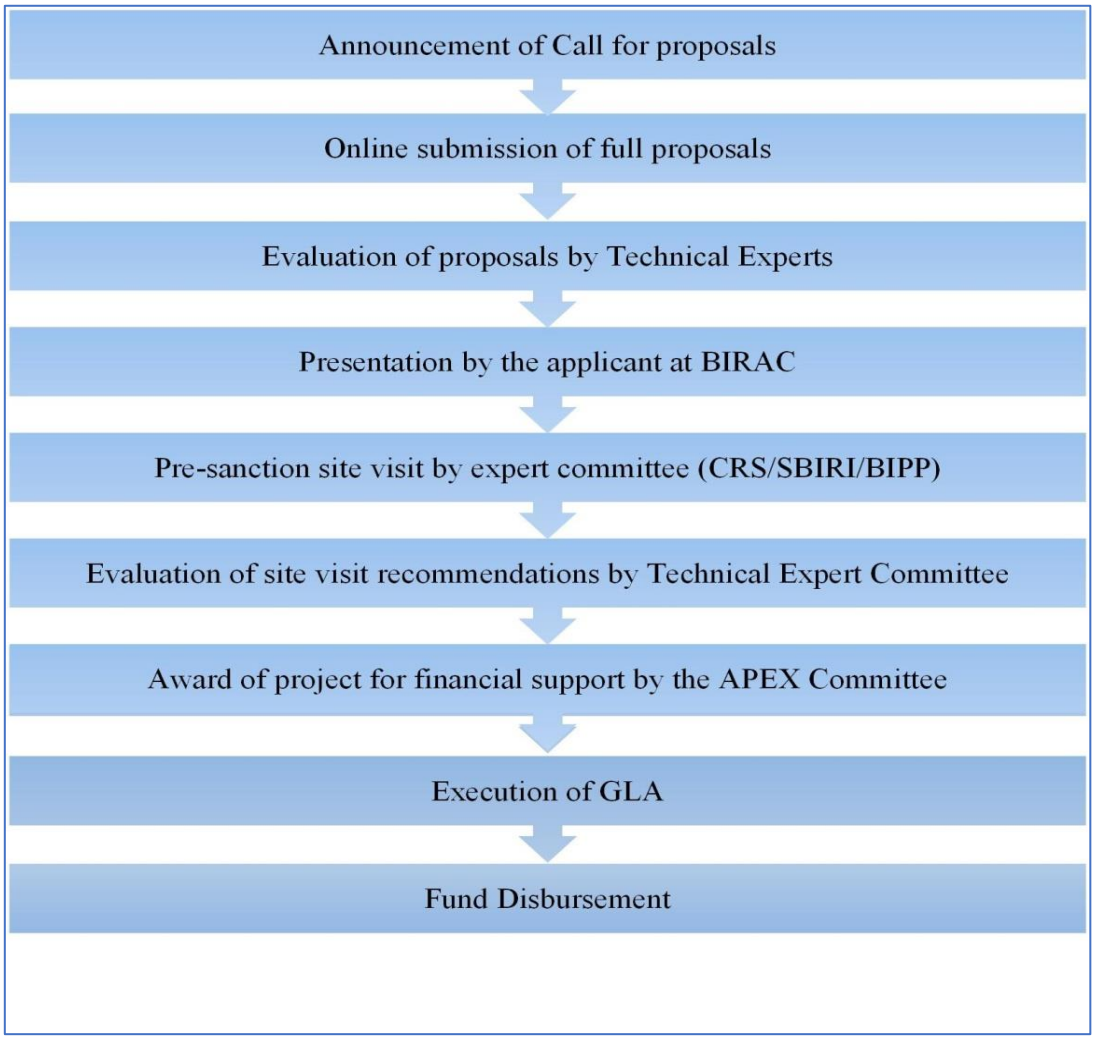
has defaulted on (i) repayment of loan and/or interest, or is irregular with regard to repayment of instalments (ii) payment of unspent balance (if any) in the earlier BIRAC supported projects (iii) payment of Royalty to BIRAC would not be considered for financial assistance by BIRAC.

3. Proposal of any company having a Director of a defaulting company (as detailed above in point no. 2) would not be considered for financial assistance by BIRAC.

Duration of Project

- Up to 24 months for proposal submitted under PACE-AIR.
- No specific duration has been fixed for PACE-CRS, SBIRI and BIPP schemes.

Evaluation Process



**Please note that the decision of the committee at any stage of the evaluation would be final and reconsideration requests would not be entertained. The applicant may reapply in the next call providing clarifications to the committee's comments/recommendations.*

Funding

Funding support will be in the form of Grant-in-Aid and is **scheme specific.** Kindly refer to the guidelines of respective schemes for more details by visiting *http://www.birac.nic.in*

Fund Disbursement Policy

The fund disbursement is milestone based and will be released in 4-5 installments as per the timeline of the project.

Installment No.	When	Amount (for proposal more than 12 month)	Amount (for proposal less than 12 month)
1	Signing of Contract	30% of project cost	30% of project cost
2	Completion of 1st Milestone	20% of project cost	30% of project cost
3	Completion of 2nd Milestone	20% of project cost	30% of project cost
4	Completion of 3rd Milestone	20% of project cost	NA
5*(Final)	Completion of project and submission of final report	10% of project cost	10% of project cost

**Since the last installment is released after conclusion of the project, its nature would be reimbursement.*

Duration of Call for Proposals

The call would open on 15th June, 2023 and shall close on **31st July, 2023 at 5:30 pm.**

Additional information

For details related to TRL definitions, schemes and submission of proposals, please log on to http://www.birac.nic.in

Note: In case of any dispute/ ambiguity/ confusion that may occur in the process of shortlisting/ selection, the decision of BIRAC shall be final and binding on all.

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