# REQUEST FOR PROPOSALS

***for supporting***

**Biotechnological Product/Technology development**

***from***

**Academia and Industry**

***under***

**i4 (BIPP, SBIRI) and PACE (AIR and CRS)**

**Under the present call, proposals are invited ONLY in areas under following fields:**

- **Healthcare- Devices and Diagnostics,**
- **Healthcare- Drugs & Drug Delivery, Biopharmaceuticals, Biosimilars, Regenerative Medicine, Stem cells, Vaccines & Clinical trials**
- **Energy, Environment and Secondary Agriculture**
- **Agriculture, Veterinary Sciences and Aquaculture**

**Proposals are invited under following areas:**

## Healthcare- Devices and Diagnostics

a. **Solutions to tackle mental health problems:** The COVID-19 induced lockdown and the related stress has created an increase in mental health problems and associated disorders. Diagnostic and screening, point of care customized solutions are required for neurological disorders and diseases. Some examples include but are not limited to; devices that track emotions, EEG and Brain Stimulation for Depression, wireless devices that change the brain's response to stress, Smart devices for Chronic Nerve Pain and Insomnia, Apps and algorithms for Cognitive Behavioral Therapy (CBT) etc.

b. **Digital Health and Telemedicine solutions using Artificial Intelligence (AI) and machine learning (ML) tools**
   - Artificial Intelligence (AI) and machine learning (ML) based systems to accurately predict chronic diseases in their early stages, respiratory diseases, delivery of health services and drug discovery
   - Augmented reality-based tools and systems for healthcare professionals
   - Digital solutions for diagnosis of Rare diseases and Genetic disorders
   - Robotics in Healthcare: Surgical Assistance Robots, Sanitation and Disinfection Robots, robots enabling lab automation & Robotic exoskeletons
   - Smart assistive technologies
   - NGS based workflows for high volume screening including mutation detection
   - Remote health monitoring solutions

**c. Innovative Technologies for diagnosis and management of respiratory illness including post-COVID pulmonary rehabilitation**

- Non-invasive, biomarker-based, rapid diagnostics for respiratory diseases including respiratory infections (excluding RT-PCR, Antigen, Antibody kits for SARS CoV-2 detection)
- Medical devices for interventional pulmonary diagnosis and procedures
- Pulmonary rehabilitation devices for COPD and Post-COVID recovery
- Ventilation and critical care accessories
- Diagnostic Imaging modalities for respiratory medicine

**d. Devices to strengthen Anganwadi workers:** Innovative devices are required to strengthen the decision making at the bedside or point of care. Solutions to measure nutritional and health status of children, Immunization records, New-born Growth Monitoring devices (infantometer), solutions for training and capacity building of Anganwadi workers, dental health monitoring solutions for children etc. are the need of the Indian health care system.

**e. Import Substitution - To promote the manufacturing capacity of India, proposals are invited for scale-up and facility creation of below-mentioned equipments and raw materials:**

- Development and scale-up of Medical Equipments such as Ophthalmic Appliances, Endoscopes/ Gastroscopes/ camera-based imaging devices, Surgical Equipments & Devices, Anesthetic Equipment, CT, MRI, X-ray, Hemodialysis machine etc
- Development and scale-up for Drug Eluting Stents (DES), Auditory Implants, Artificial valves, I.V. Cannulae, Catheters, Surgical Knives, Scissors and Blades
- Development and scale-up of raw material for dental, orthopedic, ophthalmologic, cardiac and neurological implant

**Healthcare- Drugs including Drug Delivery and Biopharmaceuticals, Biosimilars and Regenerative Medicine, Vaccines and Clinical Trials**

- Drugs including drug repurposing for Neglected Diseases, Genetic diseases & Rare Diseases, Nonalcoholic fatty liver (NAFL) & nonalcoholic steatohepatitis (NASH) & neurological disorders.
- Vaccines for neglected diseases and neurological diseases.
- New methods/technologies of drug delivery (Example- Nano crystalline solid dispersion, drug polymer/peptide conjugate, enabling technologies to improve oral bioavailability), complex generics.
- New methods/technologies for Vaccine delivery and Cold chain distribution of Vaccines.
- PAN corona vaccine and variant-specific product characterization assays (e.g., potency, identity) may need to be validated with appropriate testing plans and data.
- Scalable Organ-on-a-chip models or platform for disease modelling and drug testing
- Media Development for different Biosimilars
- Stem cell-based therapies for treatment of various diseases-:

- Technologies towards design and development of CAR-T cell therapy against cancer and other diseases
- Technologies for manufacturing of clinical grade material for cell therapy
- Methods of delivery of cell therapy products

**Energy, Environment & Secondary Agriculture:**

- Strain engineering/process development/Cost effective production technologies for the production of
  - Enzymes
  - Speciality chemicals
  - API
  - Bulk molecules and high value products
  - Industrially relevant bio-based import substitutes (intermediates, polymers, surfactants, fine chemicals, dyes, pigments, flavors and fragrances)
  - Efficient and Sustainable Biofuels/energy/blended fuels/drop-in fuels
  - Enhance methane production from biodegradable biomass dumped in the landfills
  - Biotechnological routes for decomposition of plastics/microplastics to value added products
  - Site-specific remediation of xenobiotics from the environment
- Biotechnological means for River surface cleaning/water body restoration/ restoration of degraded lands
- Development of Plant polysaccharides as a new source for coagulant – surfactant – flocculant aid
- Biotechnological intervention for Air Pollution Management (like $CO_2$ sequestration, development of biofilters etc.)
- Development of Plant based meat products/artificial meat/cultured meat
- Bioactive compounds from medicinal plants having phytopharmaceutical applications
- To establish value addition with infrastructural facilities like sorting, grading, packaging and processing for horticulture including organic produce, marine, dairy, poultry, etc
- Technologies to enhance shelf life of packaged foods/exotic fruits
- Probiotic products for lactose intolerant population
- Technologies for production of traditional drinks (beverages/dry powder based form)
- Waste management (animal farm waste and slaughterhouse waste) through biotechnological means.

**Agriculture (including veterinary sciences and aquaculture):**

**Agriculture:**

- 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
- Accelerating the productivity/yield enhancement of oilseeds and pulses

- Gene editing technologies to improve traits like yield, quality, disease resistance, etc. in crops
- Marker assisted heterosis breeding for development of improved crop varieties
- 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
- Smart pest management using Nano sensors, Nano-pesticides, pheromone, etc.
- Post-Harvest interventions with special reference to storage, grading, standardization and quality control of agricultural produce to enhance their market value

**Veterinary Sciences:**

- Vaccines for small ruminants and pet animals.
- Platform technology for vaccine development for veterinary use
- Development of diagnostics for zoonotic diseases particularly point of care tests.
- Rapid and cost-effective meat Species identification and quality testing.
- Ethno veterinary medicine.
- Food development for pet animals
- Improved or novel techniques of semen sexing in farmed ruminants
- Use of Biotechnological tools to enhance the digestion and bioavailability of the fibers for ruminants and other livestocks
- Early detection of Heat and Pregnancy in cattle

**Aquaculture:**

- Field usable diagnostic kits for disease and algal toxins relevant to aquaculture
- Aquaculture Development through Integrated approach and Aquaponics through Biotechnology interventions

## Types of Projects to be supported:

- Projects should strictly fall under the scope of the present RFP.
- Products/Technologies with established Proof of Principle for AIR and Proof of Concept for CRS
- Projects that propose a process/product innovation with 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: **TRL 3** (Proof of concept established): AIR

  **TRL 6** (Early stage validation): SBIRI

**TRL 7 and above** (Late stage validation up to pre commercialization): BIPP & CRS

## 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/ missing preliminary data and potential for product/technology development. Proposals not supported by preliminary data would be summarily rejected.
- Funding cannot be used to support PhD student research or any other academic research.
- The grant is not a research fellowship
- **Proposals not falling under the scope of present RFP.**

## Who Can Apply?

### Eligibility:

### 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 facility 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**

- Applicant (PI) must have completed at least one extramural funded project in India (with minimum project duration of 3 years & in the same research activity of the project

proposed), project must have been funded by Govt. funding agencies or Industry. Related Sanction order or funding note to be uploaded as a proof.

- Applicant (PI) must have authored one publication (indexed in Scopus/web of science) as first or lead (corresponding) author, or patents (filed) in the same research area of the project proposed for AIR. Applicant must upload the published paper or filing documents related to IP at the time of submission of application

- 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 particulars)

- 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 year 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:

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.

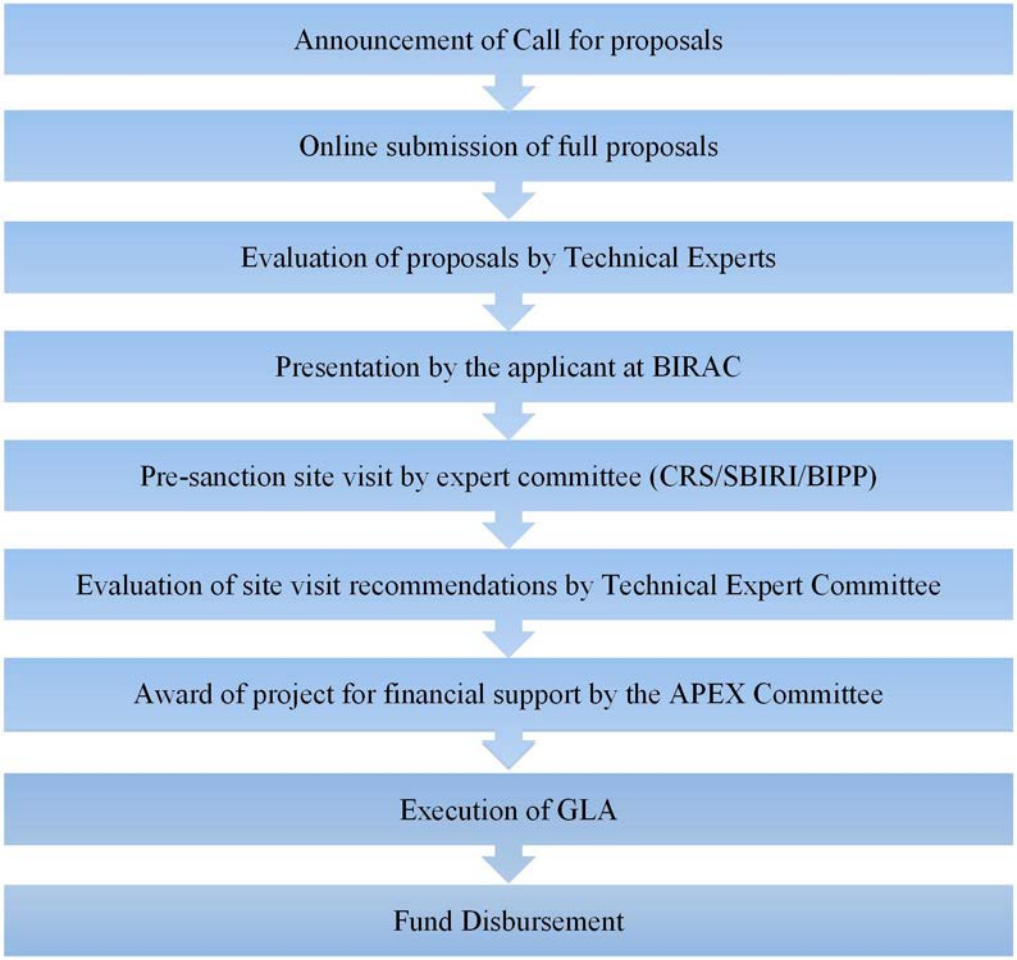
**Ineligibility:**

- 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) unless the withdrawal was due to papers not being ready.
- Proposals submitted in collaboration with companies defaulting on repayment of loan or are irregular with regard to repayment of instalments to BIRAC would be considered ineligible

## 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 instalments as per the timeline of the project.

| Instalment 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 | Completion of project and | 10% of project cost | 10% of project cost |
| (Final) * | submission of final report | | |

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

## Duration of Call for Proposals

The call would open on 15th February, 2022 and shall close on **31st March, 2022 at 5:30 p.m.**

## Additional information

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

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