



**Department of Biotechnology  
Ministry of Science and Technology  
Government of India**

**Request for Concept Proposals on “Developing stem cell-based models for disease & drug testing, and animal models to establish safety and efficacy of stem cells for potential applications as therapy for human diseases”.**

**1. Background:**

Organoids and tissues differentiated from stem cells are a promising resource for, disease modelling, drug screening and regenerative medicine as these can faithfully capture tissue organization, bridging standard cell culture approaches and *in-vivo* animal models. However, focused research efforts are needed to address issues of low reproducibility & variability as well as overcome other barriers to the use of organoids and stem cell-based pipelines as standards for drug screening, disease modeling etc.

While organoids are the future, the testing of medical treatments in animal models for safety and efficacy is an essential requirement before initiation of clinical trials in humans. Robust animal models with a high degree of pathophysiological similarity to the human disease model are required in order to readily extrapolate the dosage, route of administration, and treatment outcomes to humans. Emerging technologies like stem cell and gene therapy pose unique challenges for the evaluation of their safety and efficacy. Larger animal models are required for accurate modeling of bone, cartilage, skin, lung, pancreas, liver, intestine, cardiac, neurological, renal and other organ's injury, and evaluate corresponding treatments. Longer lived animal models are required for studying long-term effects of therapies as well as chronic and degenerative diseases.

With the increasing availability of gene editing tools and decreasing costs of genome sequencing, it is now possible to rapidly develop the use of stem cells and animal models for various purposes. This request for proposals will support organoids and stem cell-based pipelines for drug screening; stem cell based models of disease for diagnosis, drug discovery and screening; animal models to establish safety and efficacy of stem cells for human diseases relevant to the Indian subcontinent.

## 2. Purpose:

To support milestone-driven multi-institutional/multi-investigator proposals on developing organoid pipelines, disease models and animal models for human diseases, with emphasis on larger animal models. Accordingly, Concept Proposals are invited on **“Developing stem cell-based models for disease & drug testing, and animal models to establish safety and efficacy of stem cells for potential applications as therapy for human diseases”** for consideration under the Stem Cells & Regenerative Medicine Programme of the Department.

Applications are expected to have defined Milestones and Timelines detailing how the project will move forward with well defined deliverables and expected outcomes.

The focus of the Concept proposal may be on the following (*but not limited to*):

- A. Protocols for development of reproducible organoids with low/none variability as models for disease.
- B. Development of drug screening pipelines using organoids
- C. 3D printing using medical waste for development of organoids to model disease or drug screening pipelines
- D. Induced (chemical/ physical) animal models for bone, cartilage, skin, lung, pancreas, intestine, liver, kidney, cardiac, neurological and other organ's injury, and evaluation of stem cell based substitutes. Rabbit and larger animal models to be preferred.
- E. Breeding approaches for *combination rodent models*, such as immunocompromised + specific disease, particularly for evaluation of stem cell xenografting.
- F. Development of *humanized mouse/rat/guinea pig models* to evaluate immunological responses against human stem cell- derived grafts.
- G. Animal models for studying long-term effects of cell and gene therapies, and degenerative diseases.
- H. Animal models for evaluating safety of stem cell and gene therapy.

## 3. Who can Apply:

Any Indian National holding a regular position in any Indian academic and scientific institution may apply.

#### **4. Pre-requisites for submitting the Concept Proposal:**

- A. Collaborative proposals may be submitted by public and private universities, colleges, Institutes, and non-profit organizations recognized by DSIR as a Scientific and Industrial Research Organization (SIRO).
- B. The Academic centers may preferably be linked with a medical/veterinary institute.
- C. These centers/institutes/hospitals should have well defined teams of basic scientists, clinicians and animal handlers. Basic science team should have strong background in the areas of molecular biology, cell biology, immunology, and a track record of performing animal experiments.
- D. At least one partner institute should have established animal house and experimentation facilities that would meet regulatory requirements for the proposed studies.
- E. Coordination between groups working across species is highly encouraged.
- F. All concept proposals must adhere to statutory regulatory requirements.

#### **5. Proposal format and Submission:**

- i. Interested investigators/clinical researchers/scientists qualifying the pre-requisites conditions mentioned in the para 4 above are encouraged to submit the Concept Proposal as per the performa enclosed.
- ii. Font: Times New Roman, size: 12, single spacing and not more than 6 pages. Applications that exceed the page limit will be disqualified.
- iii. The Concept proposal in the prescribed format should be uploaded on the DBT eProMIS portal (<https://dbtepromis.nic.in/AnimalModel.aspx>) on or before 25<sup>th</sup> November 2022.
- iv. Incomplete or wrongly filled application which lacks essential information/documents will be summarily rejected.
- v. Proposals received after the last date of submission will not be considered.

#### **6. Contact details (for any queries):**

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Department of Biotechnology, Block-2, Room No.814,  
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## **Proforma**

1. (i) Project Title:

(ii) Specific Area of your proposal:

(iii) Name of the Project Coordinator:

(Institute address, Contact number, email)

(iv) Single Institution or Multi-centric:

[List of partnering institution(s)]

(v) Name(s) of the Investigator(s) PI/Co-PIs:

(Institute address, Contact numbers, emails)

2. Indicate category of domain expertise and potential of each PIs/Co-PIs (Basic and/or clinical research). Details of the earlier collaborations between the PIs/Co-PIs of participating institutions, if any (Multifaceted and multi-institutional collaborations encouraged)

3. Scientific Hypothesis and key questions to be addressed and Primary Objectives (100 words)

4. Detailed work plan i.e., how will you test the hypothesis/approach towards development of technology and solutions? (500 Words)

5. Novelty in the approach being proposed

6. Feasibility of doing the study in your present institution/workplace:

7. Duration of the project (Timelines and Milestones):

8. Tentative budget (under the headings Non-recurring/Manpower/Recurring).

9. List 4-6 statements on expected deliverables (a) study outcomes (or) translational outcomes.

10. Professional Experiences and Training relevant to the project

11. CV of the investigators (PIs/Co-PIs) as per format (Annexure I).

12. Any other highlights

## **Annexure I**

### **(Resume of PI/Co-PI)**

1. Name : .....
2. Date of Birth : .....
3. Sex (M/F):.....
4. Designation .....
5. Department : .....
6. Institute/University : .....
7. Address : .....
- ..... PIN :
- .....Telephone : ..... e-mail:.....
8. Specialization/Research Areas.....

#### 9. Education Details (Post-graduation onwards & Professional Courses)

Sr. No.	Degree Awarded	Institution/Place	Year	Field Of Study

#### 10. Employment Details: Position and Employment (Starting with the most recent employment)

Sr. No.	Institution/Place	Designation	From Date	To Date

#### 11. Awards/Honors Details

#### 12. Details of ongoing/completed projects.

#### 13. Publications of the last 5 years in relevant areas.