Indian Institute of Technology Delhi

School of Interdisciplinary Research (SIRe)

SIRe Project Number

2025-01-20

(will be assigned by SIRe)

Project Proposal for Ph.D.

Project Details (The research problem must clearly indicate the need for an interdisciplinary approach)	
Project Title	Developing liver-pancreatic organoids for Early Detection of Chronic Pancreatitis.
Project Summary (Minimum 500 and maximum 2000 characters)	This project aims to develop iPSC-derived liver and pancreatic organoid models to screen early CP biomarkers using ingestible diagnostic devices for preclinical evaluation. We will utilize an iPSC line from an Indian volunteer and leverage co-PI's established methods to generate pancreatic (acinar/ductal) organoids. Additionally, maskless lithography and SLA-3d printing will be employed to fabricate microdevices capable of sampling proteins, enzymes, and pro-inflammatory biomarkers in vitro from organoid models. The project is highly interdisciplinary, integrating stem cell biology, clinical pancreatitis assessment, and microfabrication techniques. Note: The required funds are already secured via an ICMR-funded project with a dedicated 'consumables head' allocated for the proposed SiRE doctoral position. To ensure clinical relevance, a clinician from AIIMS New Delhi shall be incorporated in the student's SRC.

Ph.D. Supervisors
(Supervisor 1 and Supervisor 2 cannot be from the same department of IITD)

Role	Name of Faculty	Academic Unit in IITD/Institute/University	Email ID (Official)
Supervisor 1	Prof. Deepti Abbey	KSBS	adeepti@iitd.ac.in
Supervisor 2	Prof. Sarvesh Kumar Srivastava	CBME	sksr@iitd.ac.in

Project requirements (Student qualifications, experience required, etc)
***The candidate will be shortlisted based on common shortlisting criteria decided by ScRC (SIRe)**

- Master's degree in biology with hands-on experience in animal tissue culture and molecular biology techniques.
- Candidates with experience in bioinformatics and computational analysis, including experience with programming languages such as Python or R would be preferred.

Source of fellowship/funding and project number
(CSIR/UGC/DBT/ICMR/ICAR/NEET-PG/DST-INSPIRE/IRD/FITT Project details, if any)

Candidate with his/her own fellowship/ Institute Fellowship

Role of Faculty Members involved:	
Supervisor-1	Developing organoid models, characterization and validation of device in detecting pancreatic fluids.
Supervisor-2	Microfabrication of a tissue-compatible microsampling device.