



Project Proposal for Ph.D.

Project Details (The research problem must clearly indicate the need for an interdisciplinary approach)

Project Title	Building and Validating an Integrated Framework for Monitoring Riverine AMR (Biologic-AMR)
Project Summary (Minimum 500 and maximum 2000 characters)	Environmental AMR, particularly in riverine systems, is increasingly recognized as one of the most urgent yet least addressed drivers of resistance. Addressing this concern is a key research priority, which Biologic-AMR will pursue through an interdisciplinary approach. The project aims to develop and validate a framework for understanding how resistance accumulates and circulates in rivers through interrelated factors such as pharmaceutical effluents, farming practices, human and animal waste, antibiotic use and misuse, and everyday interactions with river water. To tackle this complexity, the research will focus on four key challenges: i) Identifying the social, environmental, and biological conditions that influence the development and spread of AMR in riverine environments; Defined stretch of Ganaga River as a research filed. ii) Developing and adapting testing and surveillance frameworks for water quality—including AMR indicators and emerging contaminants—to support effective and equitable monitoring systems. The combination of these elements—data, data work, infrastructure, and surveillance—will inform the creation of a robust framework for “data infrastructuring” that strengthens environmental AMR surveillance and contributes to mitigation strategies. Empirical research will be conducted along a 100 km stretch of the river Ganga in Bihar.

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. Shaikh Ziauddin Ahammad	DBEB, IITD	zia@iitd.ac.in
Supervisor 2	Dr. Sanya Anees	ECE, NSUT, Delhi	sanya.anees@nsut.ac.in

*Supervisor 1 must be from IIT, Delhi.
+All cells in this table are mandatory fields that need to be filled by faculty for consideration of proposal.
\$The date of superannuation of supervisors should be at least three years from the date of registration of selected candidates.

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

- MTech in Electrical Engineering / Electronics & Communication Engineering/ Environmental Engineering/ Chemical Engineering / Civil Engineering

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

Candidate should have own fellowship / IRD Project

Role of Faculty Members involved:

Supervisor-1	Supervise for development of the surveillance framework to monitor different water quality indicators including AMR indicators and various emerging contaminants. Development of appropriate mitigation strategy to combat AMR proliferation.
Supervisor-2	Provide insights into the development of the sensor and communication framework and in building understanding of data infrastructuring work to be used in developing the AI/ML models.

Note :-

1. **Approval from the respective DRC/CRC/ScRC of your Department/Centre/School will be required for using the "Full-time Institute Assistantship (Category-wise) (FIA)" for selecting the students in SRe.**
2. **Declaration:- Faculty members, please ensure that you have at least 3 years of service left before superannuation along with adequate sitting space & lab facilities for the SRe student.**
3. **PI/s are also encouraged to submit joint proposals with AIIMS, NII, JNU and institutes with which IITD has an existing MoU. If the Co-PI (Supervisor 2) is from outside IITD, kindly share his/her detailed CV.**
4. **If a research scholar is to be considered for selection under the project fellowship, then the project should have a minimum of two-year duration remaining.**
5. **A candidate applying with a valid JRF/INSPIRE/any national level fellowship should have at least two-year validity from the date of joining the Ph.D. program.**
6. **The third supervisor's name (if required) can be added only after the formation of Student Research Committee (SRC) subject to a strong recommendation of SRC and subsequent approval from the competent authority.**
7. **If Institute fellowship is being sought, then DRC approval of the parent department of Supervisor 1 is required at the time of selection.**