



Project Proposal for Ph.D.

Project Details

Project Title	Microfluidic chip based electrochemical analyzers
Project Summary (Minimum 500 and maximum 2000 characters)	The requirement of point of care system for rapid but accurate detection of bioanalytes from diverse samples such as sputum, saliva and blood require careful integration of various components in a Lab-on-a-chip architecture. This requires thorough understanding of microfluidics, design of microchip, hardware integration (as commercial hardware may not be miniaturized or suit the new architecture), software for data processing and signal conditioning and finally clinical validation of system on real samples. In this project the requirement is thus to work on multidisciplinary areas of microfabrication, device integration, PCB design, electrochemistry, biochemistry and clinical validation, hence, requires candidate to have good hands-on training beforehand in a few of the domains of research if not all. Choice of biomarker to be proposed by the candidate based on his/her research interest.

PhD Supervisors

Role	Faculty	Academic Unit IITD/Institute/University	in	Email ID (Official)
Supervisor 1	Prof. Sandeep K Jha	CBME		sandeepjha@iitd.ac.in
Supervisor 2	Prof. Sudhhasatwa Basu	CHEM. ENGG		sbasu@chemical.iitd.ac.in

Project requirements (Student qualifications, experience required, etc)

- Background in electrical Engineering/ Physics / microfabrication and also having significant knowledge in biochemistry/Biotechnology / immobilization / antibody stabilization
- Candidate shall be trained in microfabrication, electronic circuit development and assembly of hardware if not already versed

Source of fellowship/funding

(CSIR/UGC/DBT/ICMR/ICAR/NEET-PG/DST-INSPIRE/IRD/FITT Project details, if any)

Candidate with his/her own fellowship

Role of Faculty Members involved:

Sandeep K. Jha: (1) diagnostic lab-on-a-chip development using photolithographic processes (2) design and development of hardware and signal processing algorithm for the POCT device (3) limited clinical validation of product at final stages of project

Prof. Sudhhasatwa Basu: (1) Electrochemistry (2) device calibration and detection of presence of biomarkers.