



PhD Project

Project Details

Project Title	Protein Biomarker Based Noninvasive Detection of Lung Cancer
Project Summary	<p>Summary: Approximately 28% all cancer related deaths have been associated with lung cancer and approximately 80% of the lung cancer fall under the category Non-small cell lung carcinoma (NSCLC). Hence, detection of NSCLC at early stage is clinically extremely important. A number of protein-based biomarkers such as CEA, CYFRA-21-2, EGFR, SFTBP-57 are detected in blood sample but there concentration is extremely low. Sputum that is a direct sample from lungs contains exfoliate epithelial cells and liquid and thus likely to have relatively higher concentration of biomarkers compared to blood samples. In the present project it is planned to detect these biomarkers in simulated sputum sample to overcome processing of sputum, concentration of biomarkers and finally develop a point-of-care device for diagnosis of lung cancer through sputum sampling.</p>

PhD Supervisors

Role	Faculty	Academic Unit in IITD	Email ID
Supervisor 1	Sandeep K Jha	CBME	sandeepkjha@gmail.com
Supervisor 2	Prashant Mishra	DBEB	pmishra@dbeb.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
- Shall be trained in microfabrication, electronic circuit development and assembly of hardware

Source of funding (IRD/FITT Project details, if any)

CSIR/DBT/ICMR Fellowship OR MHRD fellowship to outstanding candidate

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

Prashant Mishra: (1) Preparation of magnetic antibody for the capture of biomarkers (2) Study of presence of biomarker in human cancer cell lines (3) Detection of presence of biomarkers in Tissue microarray