



Project Proposal for Ph.D.

Project Details	
Project Title	Dissecting phenotypic heterogeneity in response to immunotherapy in Lung cancer patients
Project Summary (Minimum 500 and maximum 2000 characters)	Worldwide, non-small cell lung cancer (NSCLC) is a common cause of cancer-related mortality. Immune checkpoint inhibitors (ICIs), such as PD-1/PD-L1 inhibitors, have revolutionized the treatment of many cancers, including lung cancer but several patients either do not respond or become resistant to these treatments. T cell phenotypic heterogeneity within the tumor immune microenvironment (TIME), the balance between effector and exhausted T cells, correlates to response or resistance to ICIs in NSCLC patients. A deeper understanding of these T cell subtypes can provide insight into mechanisms of resistance and guide the development of novel therapeutic strategies. This project aims to explore T-cell phenotypic heterogeneity as a key factor underlying response and/or resistance to ICIs in patients undergoing surgery after treatment with ICIs, against a group of control patients receiving chemotherapy only. Objectives: 1. To characterize the T cell subpopulations in tumor post exposure to ICI 2. To identify phenotypic markers on tumour infiltrating T cells. 3. To investigate the longitudinal changes in peripheral blood T cells phenotype

Ph.D. Supervisors			
Role	Name of Faculty	Academic Unit in IITD/Institute/University	Email ID (Official)
Supervisor 1	Dr. Ishaan Gupta	IITD	ishaan@iitd.ac.in
Supervisor 2	Dr.Prabhat Singh Malik	AIIMS Delhi	drprabhatsm@gmail.com

Project requirements (Student qualifications, experience required, etc) *The candidate will be shortlisted based on common shortlisting criteria decided by ScRC (SIRe)
• B.Sc., M.Sc. Zoology, Biotechnology, Life Sciences from Central University or CFTI • CSIR or UGC-NET cleared • 2-years of hands-on experience in Bioinformatics. The candidate is expected to have expertise in Bash, Python, Genomics and Machine learning. The candidate must have experience in processing clinical genomics samples.

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/ Institute Fellowship

Role of Faculty Members involved:	
Supervisor-1	Dr. Ishaan Gupta; Department of Biochemical Engineering and Biotechnology, IIT Delhi Role - Guiding experimental design, data analysis and functional genomics studies through Computational Biology expertise.
Supervisor-2	Dr. Prabhat Singh Malik, Medical Oncology, AIIMS New Delhi Role - Guiding study design, patient recruitment, clinical profiling and translational of research through medical oncology expertise.