INDRAPRASTHA INSTITUTE of INFORMATION TECHNOLOGY DELHI

10 YEARS of EXCELLENCE

Invitation to M.Tech. Thesis Defense of Jyotsana Mehra: July 25, 2020 (Saturday): 15.00-16.00 IST

In Partial Fulfillment of the Requirements for the Degree of

M.Tech. CB

Jyotsana Mehra (MT18237)

Will defend her thesis

Title: "**Deciphering the Role of lncRNA in Tuberculosis Progression**"

IIIT-D Faculty and Students are invited

Date: July 25, 2020 (Saturday)
Time: 15.00-16.00 IST
Google meet link; https://meet.google.com/bpn-hqwi-hyd

Examiner:	**Internal:**	**Ganesh Bagler**
	External/Internal:	**Mitali Mukerji, CSIR-Institute of Genomics and Integrative Biology**
	Advisor:	**Tavpritesh Sethi**

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Abstract

"Long non-coding RNAs can regulate mRNA translation through masking and sponging thus affecting downstream biological pathways. In Tuberculosis, the formation of T cell- bounded hypoxic granuloma is a host immune defence for containing infected Mtb-macrophages. Our study discovers a mechanistic pathway of Mtb-induced HIF1A silencing by the antisense lncRNA-HIF1A-AS2 in T cells. Computational analysis of in-vitro T-cell stimulation assays in progressors (n=119) versus non-progressor (n=221) tuberculosis patients revealed the role of lncRNA mediated disruption of hypoxia adaptation pathways in progressors. We found 291 upregulated and 227 downregulated DE lncRNAs that were correlated at mRNA level with HIF1A and HILPDA which are major players in hypoxia response. We also report novel lncRNA-AC010655 (AC010655.4 and AC010655.2) in cis with HILPDA, both of which contain binding sites for the BARX2 transcription factor, thus indicating a mechanistic role. Detailed comparison of infection with antigenic stimulation showed a non-random enrichment of lncRNAs in the cytoplasmic fraction of the cell in TB progressors. The lack of this pattern in non-progressors replicates indicates the hijacking of the lncRNA dynamics by Mtb. The in-vitro manifestation of this response in the absence of granuloma indicates pre-programmed host-pathogen interaction between T-cells and Mtb regulated through lncRNAs, thus tipping this balance towards progression or containment of Mtb."