

## **ICTS Seminar**

Title : Computational systems biology of cancer metastasis: can theory help understand cancer biology?

Speaker : Mohit Kumar Jolly, Rice University, USA

Date : Wednesday, November 22, 2017

Time : 2:00 PM

Venue : Emmy Noether Seminar Room, ICTS Campus, Bangalore

Abstract : Metastasis – the spread of cancer to distant organs – causes above 90% of all cancer-related deaths. More than 95% of metastases are formed by cancer cells leaving the primary tumor as clusters of 5-8 cells. What underlying mechanisms can drive the formation of such clusters?

I have developed mechanism-based mathematical models for regulatory networks driving this behavior, and identified multiple ‘phenotypic stability factors’ (PSFs) that can stabilize a hybrid epithelial/mesenchymal (E/M) phenotype that facilitates collective migration. Modeling the interconnections among these networks with those controlling tumor-initiation potential predicts how hybrid E/M cells are much more likely to form metastases. These predictions have been validated in many *in vitro* and *in vivo* experiments, and are supported by the association of poor patient outcome with high levels of PSFs across cancer types.

Collectively, my work decodes the systems-level emergent dynamics of regulatory networks regulating metastasis, and uncovers many previously unknown accelerators of metastasis.