SMART
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BioSyM
BIOSYSTEMS AND MICROMECHANICS

BioSyM Seminar Series 2018

Investigations of T Cell Receptor Quality Against Tumor Neoantigens

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Date : **26th November 2018, Monday**

Time : **12 pm to 1 pm**

Venue : **Level 5, Perseverance Room**

Abstract

Triggering of T cells plays a central role to generate adaptive immunity. T cells can be triggered either by interaction of their surface αβ T cell receptors (TCRs) with the peptides bound to major histocompatibility complexes (pMHCs) expressed by antigen presenting cells (APCs), or by the binding between CD3 complexes with the specific monoclonal antibodies (mAbs). We are employing robotic Optical Tweezers (OT) integrated with image analysis to probe the triggering of Jurkat T cells using two mAbs and specific pMHC. Optically trapped polystyrene beads coated with mAbs/pMHC are actively presented to T Cells which are pre-loaded with labeled calcium indicators and immobilized on glass surfaces. A binding interaction permits force transmission exerted by the trap into a biochemical signal which in turn, leads to a transient rise of calcium and other biochemical events resulting in transcriptional activation. After successful triggering, the T cells can be recovered for further analysis. This work is in collaboration with Prof. Asada Group and Prof. Gascoigne Group (NUS Immunology).

Short Biography

Debasis Banik joined SMART-BioSyM in 2018 as a Postdoctoral Associate under Prof. Matthew J. Lang. He obtained his doctoral degree in Chemistry from the Indian Institute of Technology (IIT), Kharagpur in 2018. His current research interest is to study T cell- antigen interaction using Optical Tweezers.