Singapore Immunology Network
A*STAR

SIgN Immunology Seminar

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Host: Prof Paola Castagnoli
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Date: Wednesday, 23rd November 2011
Time: 11am – 12pm
Venue: SIgN Seminar Room, Immunos Building Level 4, Biopolis

Application of quantitative mass spectrometry based Proteomics in Immunology and signal transduction studies

Efficient adaptive immunity depends on coordinated interaction of T-cells and Antigen presenting cells (APC) such as B-cells or dendritic cells (DC). DCs are able to directly affect T-cell function by providing directional signals (cytokine production and cell contact), which may result in the generation of effector, tolerogenic, or memory T-cells. Cell-cell contact area formed between T-cell and APC is known as the immunological synapse (IS). Initial interaction between T-cell receptor (TCR) and major histocompatibility complex (MHC) loaded with peptide antigen is further stabilized by co-stimulatory molecules. Immunological synapse has been studied for years using fluorescent microscopy techniques as well as classical biochemical methods. The results from previous research give us basic idea about main players, although complex picture of events occurring during antigen presentation is still missing. For the first time, using quantitative mass spectrometry, we generated temporal phosphoproteome profiles which enabled us to follow the molecular and cellular processes during antigen presentation. We revealed signaling pathways and kinase motifs regulated by IS assembly. Finally, we have proven the need for mass spectrometry approach to monitor multiple signaling events in APC and T-cells simultaneously.