

SlgN Immunology Seminar



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Epithelial regulation of immune homeostasis and inflammation in barrier tissues

Host

Prof Paola Castagnoli
Singapore Immunology Network, A*Star

Date

**Monday,
3 December 2012**

Time

11am – 12pm

Venue

SlgN Seminar Room,
Immunos Building
Level 4
Biopolis

Epithelial tissues such as the intestine and the skin form life-sustaining structural and immunological barriers at the interface between the body and the environment. Being constantly confronted by environmental microbes epithelial tissues have the formidable task to maintain normal tissue function and at the same time launch appropriate defence, wound healing and regenerative responses upon injury and infection. Immune homeostasis in barrier epithelial tissues depends on tightly regulated interactions between epithelial, stromal and immune cells and commensal and environmental microorganisms. Failure to properly control epithelial immune responses causes severe chronic diseases such as inflammatory bowel disease (IBD) and psoriasis. For many years, efforts to understand the pathogenic mechanisms in chronic inflammatory diseases such as IBD and psoriasis focused on adaptive immunity. More recently, the role of innate immunity and of epithelial cells in the regulation of immune homeostasis and inflammation in barrier surfaces has gained increased attention. Their positioning at the outermost frontiers of the body endows epithelial cells with the duty to not only build a mechanical barrier but also to recognise threats and launch immediate and effective responses aiming to contain the damage and alert the immune system. Signalling pathways controlling epithelial cell responses to microbial, immunological, physical and chemical insults have central functions in the regulation of immune homeostasis in barrier surfaces. Our previous genetic studies in mice showed that IKK/NF-kappaB signalling and also the FADD / caspase-8 / RIP kinase pathways controlling apoptotic and necroptotic cell death have epithelial-specific functions that are critical for the regulation of immune homeostasis and inflammation in both the intestine and the skin. Our ongoing studies shedding light on the mechanisms by which TNF receptors and Toll like receptors act on epithelial cells to control immunity and inflammation in epithelial barriers will be discussed.