

Molecular signaling networks in regulation of immunity and disease

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Sunday November 3rd – till Thursday, November 7th – 2013

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The gut microbiota, host tissues, and the immune system form a complex network where extensive crosstalk and molecular interactions substantially impact the overall state of the system. Concomitantly, modulation of host immune function is recurrently a result of the interaction of complex and dynamic microbial communities with the immune cell compartment in the gut, and therefore the interaction between components from different gut bacteria can efficiently shape the phenotype of the immune response.

A specialized antigen-presenting cell present at mucosal surfaces, the dendritic cell (DC), plays a crucial role in shaping the nature of the adaptive/memory-based immune response after encountering inflammatory compounds. In the gut, the DC is continuously exposed to microbial and dietary components that are recognized by its innate pattern recognition receptors, and the phenotype developed in the DC during activation is of profound importance for the state of immune response and thereby also affects the inflammatory and metabolic status in tissues.

We have shown that specific fermentation products from gut bacteria have distinct immunoregulatory effects that effectively inhibit the pro-inflammatory properties of common gut commensals. We are currently looking into the mechanisms behind the anti-inflammatory effects of the microbial fermentation products with a specific interest in the complex interactions between enzymes catalyzing post-translational modifications, transcription factors and other molecules that make up the intracellular signaling networks in DCs and shape specific DC phenotypes of importance for health and disease.