Gut reactions: Immune pathways in the intestine in health and disease

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The gastrointestinal (GI) tract is home to a large number and vast array of bacteria that play an important role in nutrition, immune system development and host defense. In inflammatory bowel disease (IBD) there is a breakdown in this mutualistic relationship resulting in aberrant inflammatory responses to intestinal bacteria. Studies in model systems indicate that intestinal homeostasis is an active process involving a delicate balance between effector and immune suppressive pathways. The cytokine IL-23 plays a pivotal role in orchestrating intestinal inflammation and several genes in the IL-23/Th17 pathway confer risk to IBD. We have recently shown that IL-23 acts directly on T cells to promote pathological Th17 type responses at the expense of immune suppressive regulatory T cells. In addition IL-23 drives a novel population of innate lymphoid cells (ILC) that mediate colitis through the production of Th17 associated cytokines. Like Th17 cells, IL-23 driven ILC are dependent on the transcription factor RORγt indicating striking functional parallels between innate and adaptive lymphoid populations in the gut. Together these results highlight the multiple activities of IL-23 that mediate tissue inflammatory responses.

References