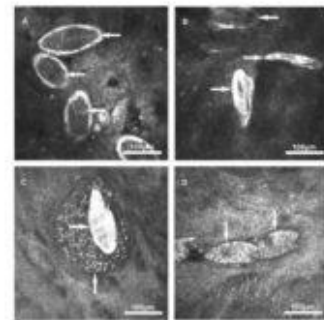
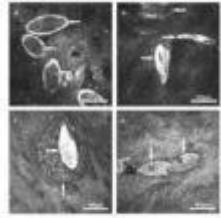


Type I interferons are important in anti-helminth Th2 immunity



Confocal images of *Schistosoma* eggs (Holtfreter et al., 2011. PlosOne)

Type I interferons (IFN) have been traditionally associated with innate immune defences against viruses and bacteria which ultimately result in Th1/17-type adaptive immune responses. Although a Type I IFN signature has been detected in immune cells responding to pathogens other than viruses and bacteria, the significance of these observations is not fully understood. Recently, Webb and co-authors showed that Type I IFN signaling is also a critical component of the [Th2-type immune response](#) against helminth *Schistosoma mansoni* (Sm) eggs.

Sm is the cause of intestinal schistosomiasis, a chronic disease prevalent in many tropical regions. Adult *Sm* parasitize blood vessels of the large intestine, where for a long time they can dwell and produce eggs remaining unnoticed by the immune system. The *Sm* eggs induce inflammation in the gut mucosa and [surrounding organs](#), which ultimately results in organ damage.

In 2004, Trottein and colleagues found that *Sm* eggs induce a Type I IFN signature in dendritic cells, the sentinels of the immune system. More than a decade later, Webb et al. explored this finding further using murine bone marrow-derived dendritic cells, grown in the presence of Flt3 ligand to represent the three major sub-types of DCs resembling the *in vivo* DC repertoire.

Webb and co-authors found that upon exposure to *Sm* eggs/egg-derived compounds, DCs produced ample quantities of different TI IFNs. Upon closer investigation, it was found that IFN α a major type I IFN, was mainly produced by class 2 conventional DCs, but not plasmacytoid DC- the main source of IFN α in antiviral responses. The researchers further performed adoptive transfer experiments to confirm that *Sm*-activated DCs migrated to mouse draining lymph nodes, where they promoted Th2 polarization by inducing production of Th2-associated cytokines. Through a series of subsequent experiments, Webb and co-authors established that effective DC migration triggered by *Sm* eggs was also dependent on functional IFN α receptor signaling. Finally, by injecting *Sm* egg antigens directly into a mouse, the authors demonstrated that exposure to *Sm* eggs induces up-regulation of IFN-stimulated gene expression in DCs across different tissues *in vivo*.

In summary, the study by Webb et al. elucidates for the first time the role of Type I IFN signaling in helminth egg-driven Th2-type immunity and highlights the context-dependent nature of Type I IFN signaling triggered by different pathogens. On a broader scale, these findings have important implications for

ongoing studies on anti-helminth vaccines and research focusing on co-infections of helminths and other pathogens, such as HIV.

Journal article: [Webb et al., 2017. Type I interferon is required for T helper \(Th\) 2 induction by dendritic cells. EMBO J](#)

References: [Trottein et al., 2004. A type I IFN-dependent pathway induced by Schistosoma mansoni eggs in mouse myeloid dendritic cells generates an inflammatory signature. J Immunol](#)

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