

Title:

IL-17A-Mediated Protection in Acanthamoeba-Induced Keratitis

Authors:

Amol Suryawanshi, Zhiyi Cao, Noorjahan Panjwani

Presented by:

Amol Suryawanshi

Department:

Department of Ophthalmology, School of Medicine

Abstract:

Acanthamoeba keratitis (AK) is a globally emerging, intensely painful and vision impairing infection of the cornea that is difficult to treat. Although past studies have indicated a critical role of neutrophils and macrophages in AK, the relative contribution of a recently discovered proinflammatory cytokine, IL-17A that is essential for migration, activation and function of these cells into the cornea is poorly defined. Moreover, the role of adaptive immune response particularly contribution of recently discovered CD4+ T cell subsets, Th17 and Tregs, in AK is yet to be understood. In this report, using a mouse corneal intrastromal injection-induced AK model, we show that corneal Acanthamoeba infection induces a strong CD4+ T effector and regulatory T cell response in the cornea as well as local draining lymph nodes (dLN). Furthermore, we demonstrate that corneal Acanthamoeba infection induces IL-17A expression proportional to the AK lesion severity and that IL-17A expression is essential for host protection against corneal Acanthamoeba infection and associated tissue damage. Accordingly, IL-17A neutralization in Acanthamoeba infected animals resulted in a significantly increased chronic corneal AK pathology, increased migration of inflammatory cells at the site of inflammation and a significant increase in effector CD4+ T cell response in dLNs. Further studies indicated that neutrophils and CD4+ T cells contribute to the source of IL-17A during early and late stages of AK, respectively. Thus, in sharp contrast to other corneal infections such as herpes and Pseudomonas aeruginosa where IL-17A contributes to corneal pathology and inflammation, findings presented in this manuscript indicate that IL-17A response after Acanthamoeba infection plays an important role in host protection against invading parasites and minimizes associated corneal tissue damage.