Project Area
Neuroscience and Ophthalmology

E02 INF-β signaling and microglial activation in retinal degeneration

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Abstract
Microglial activation is a hallmark of human retinal degenerations including Retinitis Pigmentosa and Age-related Macular Degeneration (AMD) [1]. Genetic mouse models have shown that chronic alerted microglia trigger and perpetuate retinal degeneration leading to vision loss [2-3]. Immuno-regulatory microglia exist in the early activation phase but are overwhelmed by rapidly expanding pro-inflammatory cells. In mouse models of multiple sclerosis, interferon-β (IFN-β) attenuates migration, chemokine secretion and phagocytosis of brain microglia [4]. Our analyses of retinoschisindeficient (Rs1h-/-Y) mice revealed type 1 interferon receptor (IFNAR) signaling, indicating that IFN-β-dependent anti-inflammatory mechanisms also occur in retinal microglia. This project therefore aims at elucidating the potential regulatory role of IFN-β on retinal microglia homeostasis. The first part of the project will analyze whether IFNARdeficiency leads to enhanced retinal dystrophy in a mouse model of X-linked juvenile retinoschisis (Rs1h-/-Y). Further experiments will study the exact mechanisms of IFN-β signaling in isolated microglia with a special emphasis on the novel interferon-regulated gene AMWAP (activated microglia whey acidic protein) [5].

Cited literature


The novel activated microglia/macrophage WAP domain protein, AMWAP, acts as a counter-regulator of proinflammatory response. 
*J Immunol.* (2010); **185**:3379-90.