CD83 Expressed on Dendritic Cells and Microglia Controls Inflammatory Autoimmune Responses in the Periphery and the Central Nervous System

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Introduction: CD83, a well-known surface marker for mature dendritic cells (DCs), is also expressed on activated B and T cells as well as on regulatory T cells and plays a crucial role for T cell development during thymic selection. In addition, also antigen-presenting cells (APCs) of the CNS, like microglia acquire CD83 expression under defined conditions. However, the precise role of membrane-bound (mCD83) expressed on DCs and especially microglia was largely unknown when the present investigations were initiated. Thus, we aimed to unravel the biological function of CD83 expression on DCs and microglia both under homeostatic and pathologic conditions.
Methods: We used DC- and microglia-specific cKO mice to investigate the function of CD83 in these cells under steady state and patho-physiological conditions. In particular, we assessed the outcome of autoimmune neuroinflammation in these mice using the experimental autoimmune encephalomyelitis (EAE) model.
Results: CD83-deficient DCs are characterized by an over-activated phenotype leading, on the one hand to faster clearance of acute infections, but on the other hand to an impaired resolution of autoimmune inflammation by subverting Treg suppressive capacities. Interestingly, further data showed that CD83 expression by microglial cells is differentially regulated by acute and chronic inflammatory stimuli. Additionally, CD83 cKO microglia provide less trophic support during neuroinflammation, thus exacerbating the course of EAE.
Conclusion: Here we show for the first time that CD83 expression on DCs and microglia is essential for the resolution of neuroinflammatory autoimmune responses within the CNS.

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