Retrovirology

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Reduced CD4 type 1 cytokine response by HIV-1 transgenic rat may be correlated with increased SOCS-1 expression from dendritic cells

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from 2006 International Meeting of The Institute of Human Virology
Baltimore, USA. 17–21 November, 2006

Published: 21 December 2006

Retrovirology 2006, **3**(Suppl 1):S103 doi:10.1186/1742-4690-3-S1-S103

Suppressor of cytokine signaling-1 (SOCS-1) is an inducible negative regulator of the JAK/STAT signal pathway; SOCS-1 is expressed in dendritic cells (DCs) and negatively regulates activation and type 1 regulatory cytokine production. Infection with human immunodeficiency virus type 1 (HIV-1) results in cytokine dysregulation by DCs. Since effector/memory formation depends upon clonal expansion of naïve T cells following the initial encounter with antigen and since cytokines play a critical role in the initiation and regulation of immune responses by DCs, events that negatively affect antigen presentation, co-stimulation and cytokine production by DCs can also negatively affect T cell immune responses. We have earlier reported that HIV-1 transgenic rats have defects in type 1 cytokine production, type 1 cytokine responses and generation of effector/memory CD4 T cell subsets. Here we show that BMDC from HIV-1 transgenic rats express significantly elevated levels of IL10 and reduced levels of IL-12 proteins in addition to elevated SOCS-1 mRNA following stimulation with lipolysaccharide (LPS) compared to age matched controls. These results suggest that elevated levels of SOCS-1 in DCs may negatively regulate type 1 cytokine production leading to dysregulation of T helper 1 responses reported in the HIV-1 transgenic rat.

Acknowledgements
NIH-NIAID R01-A163171.