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Inhibition of SOCS1$^{-/-}$ lethal auto-inflammatory disease correlated to enhanced peripheral foxp3^{+} regulatory T cell homeostasis

Joseph Larkin III
University of Florida, USA

SOCS1$^{-/-}$ mice, which are lymphopenic, die less than 3 weeks after birth of a T cell mediated autoimmune inflammatory disease characterized by leukocyte infiltration and destruction of vital organs. Notably, Foxp3^{+} regulatory T cells (Tregs) have been shown to be particularly potent in inhibiting inflammation associated autoimmune diseases. We observed that SOCS1$^{-/-}$ mice were deficient in peripheral Tregs despite enhanced thymic development. The adoptive transfer of SOCS1 sufficient Tregs; CD4^{+} T lymphocytes; or administration of SOCS1-KIR, a peptide that partially restores SOCS1 function, mediated a statistically significant, but short-term survival of SOCS1$^{-/-}$ mice. However, the adoptive transfer of SOCS1 sufficient CD4^{+} T lymphocytes, combined with the administration of SOCS1-KIR, resulted in a significant increase in the survival of SOCS1$^{-/-}$ mice both short term and long term, where 100 percent death occurred by day 18 in the absence of treatment. Moreover, the CD4^{+}/SOCS1-KIR combined therapy resulted in decreased leukocytic organ infiltration, reduction of serum IFNγ, and enhanced peripheral accumulation of Foxp3^{+} Tregs in treated mice. These data show that CD4^{+}/SOCS1-KIR combined treatment can synergistically promote the long-term survival of peri-natal lethal SOCS1$^{-/-}$ mice. In addition, these results strongly suggest that SOCS1 contributes to the stability of the Foxp3^{+} Treg peripheral population under conditions of strong pro-inflammatory environments

Biography

Joseph Larkin, III completed his Ph.D in 2000 from the University of Florida and conducted postdoctoral studies at the University of Pennsylvania and the Wistar Institute. He is currently an Assistant Professor at the University of Florida. He has published more than 20 papers in reputed journals, was a member of the American Association of Immunologists Minority Affairs Committee, and currently serves on the editorial board of several distinguished journals

jlarkin3@ufl.edu