The Journal of Immunology, 2012, 188, 45.21

45.21

The innate function of T cells in control of inflammation

Hong Tang,[1] Jie Du,[2] Jin Feng,[1] and Feifei Ma[2]

[1]Key Laboratory of Infection and Immunity, Institute of Biophysics, Chinese Academy of Sciences, Beijing, China
[2]Beijing Institute of Heart, Lung and Blood Vessel Diseases and the Key Laboratory of Remodeling-related Cardiovascular Diseases, Anzhen Hospital of the Capital Medical University, Beijing, China

We have previously shown that T cells are both necessary and sufficient to temper Toll like receptor (TLR) mediated inflammatory response to pathogens, in a TCR-independent manner. In addition, CD8 gene targeting (CD8 KO) or CD8+ T cells depletion by antibody significantly reduce cardiac interstitial fibrosis induced by angiotensin II (Ang II) infusion, whereas CD8 KO mice reconstituted with CD8+ T cells become sensitive to Ang II. Most importantly, CD8+ T cells are required for macrophage infiltration and expression of monocyte chemoattractant protein 1 (MCP-1) that are responsible to Ang II-induced cardiac fibrosis. Furthermore, in vitro transwell experiments show that MCP-1 production by macrophages and its chemotaxis effect on macrophage motility require direct contact with activated CD8+ T cells, but independent of T cell receptor (TCR). A similar cardiac fibrotic response to Ang II is observed in both OT-I transgenic mice that expresses a surrogate TCR specific to ovalbumin and in wild type mice. Thus, CD8+ T cells are both necessary and sufficient for macrophage-induced hypertensive cardiac fibrosis. Therefore, TCR-independent activation of macrophages by CD8+ T cells casts yet a novel innate function of T cells that, in addition to suppressing the innate inflammatory response to infections, CD8+ T cells are required to activate inflammatory response of macrophages to danger signals.