ImmunoTools IT-Box-139 Award 2013

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The role of activin-A in the induction of human regulatory T cells.

Allergic asthma is a serious lung disease characterized by airway hyperresponsiveness (AHR) and inflammation. Current therapeutic regimes suppress the symptoms but fail to provide a cure. A cardinal asthma feature is excessive T cell type 2 (Th2) responses against harmless environmental antigens. Regulatory T cells (Tregs) are essential for the suppression of allergic responses and the maintenance of airway tolerance. Still, Treg responses are defective in asthmatics, a phenomenon linked with enhanced inflammation and disease exacerbations.

Previous studies by our group have uncovered the cytokine activin-A as a novel inducer of mouse Tregs that restrain airway inflammation and protect against experimental asthma (Semitekolou M. et al, J Exp Med 2009). In our current studies we are investigating the role of activin-A in the generation of functional human Tregs (activin-A-iTregs). More specifically, we aim to examine whether human activin-A-iTregs can suppress human Th2 cell responses *in vitro*. These studies may unveil activin-A-iTreg cells as new therapeutic targets that can be utilized for safer and individualized therapies in asthma.

The ImmunoTools anti-human antibodies will be of great importance for our project since we will use them to characterize the phenotype of activin-A-treated T cells. More specifically, we will isolate peripheral blood mononuclear cells (PBMCs) from individuals with atopy and asthma and will culture them in the presence of recombinant activin-A or PBS/control *in vitro*. Subsequently, we will analyze their phenotype for the expression of human markers expressed on the cell surface of $CD4^+$ Tregs by flow-cytometry (CD3, CD4, CD25, CD45RA, CD45RO) (*Miyara M. et al, Immunity 2009).* In addition, we will clarify the activation status of $CD4^+$ T cells (CD25, CD69) and the maturation and activation status of antigen presenting cells (CD40, CD80, CD86, HLA-DR) cultured with activin-A or control. Moreover, we will utilize these anti-human antibodies for the performance of sorting of distinct subsets of peripheral blood $CD4^+$ T cells, such as naive $CD4^+$ T cells and memory $CD4^+$ T cells (CD4, CD25, CD45RA, CD45RO, CD62L, CD95) (*Gattinoni, L. et al. Nat. Med. 2011*). Then, we will use these sorted subsets to test the tolerogenic effects of activin-A on specific $CD4^+$ T cell subpopulations. Finally, if we could use the whole panel of ImmunoTools anti-human antibodies we would also examine by flow cytometry the

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effects of activin-A on other leukocytes as well, experiments that would provide a more thorough insight in the role of activin-A.

ImmunoTools *IT-Box-139.2* for **Sofia Tousa** includes 100 antibodies

FITC - conjugated anti-human CD1a, CD3, CD4, CD5, CD6, CD7, CD8, CD14, CD15, CD16, CD19, CD21, CD25, CD29, CD35, CD36, CD41a, CD42b, CD45, CD45RA, CD45RB, CD45RO, CD49d, CD53, CD57, CD61, CD63, CD80, CD86, HLA-DR, IL-6, Control-IgG1, Control-IgG2a, Control-IgG2b, Annexin V

PE - conjugated anti-human CD3, CD4, CD8, CD11b, CD15, CD14, CD18, CD19, CD20, CD21, CD22, CD31, CD33, CD38, CD40, CD45, CD45RB, CD50, CD52, CD56, CD58, CD62p, CD72, CD95, CD105, CD147, CD177, CD235a, HLA-ABC, IL-6, Control-IgG1, Control-IgG2a, Control-IgG2b, Annexin V

PE/Dy647 -tandem conjugated anti-human CD3, CD4, CD8, CD14, CD19, CD20, CD25, CD54

APC -conjugated anti-human CD2, CD3, CD4, CD8, CD10, CD11a, CD11c, CD14, CD16, CD27, CD37, CD42b, CD44, CD45, CD59, CD62L, CD69, CD71, IL-6, Control-IgG1, Control-IgG2a, Control-IgG2b, Annexin V

DETAILS