ImmunoTools IT-Box-139 Award 2012

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Regulatory immune function during childhood in relation to environmental influence and allergy development

Regulatory immune cells are important for ensuring appropriate immune responses. It is possible that dysfunctional regulatory cells may contribute to allergy. In humans, not much is known regarding factors that influence maturation of regulatory immune cells early in life, and further studies are needed to functionally characterize subsets of these cells in humans, and particularly in children

I will analyze cells from a cohort of allergic and non-allergic children that have been followed from birth to the age of five. These children have also been evaluated for parameters known to influence immune maturation, e.g presence of EBV-virus and gut flora composition.

The focus of my PhD-work is to characterize regulatory B-cell and T-cell subsets in cord blood mononuclear cells and in peripheral blood mononuclear cells from children in terms of resting and activated phenotypes and intracellular production of the regulatory cytokines IL-10 and TGF-β. My aim is to contribute to identifying a good B-cell regulatory phenotype by staining B-cells for CD19, CD5, CD10, CD23, CD24, CD27, CD38, CD43 and CD45RB to evaluate if regulatory, cytokine producing, B-cells are primarily of naive (CD5, CD10, CD43), transitional (CD5, CD24, CD38) or memory (CD27, CD45RB) phenotype and how/if regulatory B-cell phenotype is altered with age.

Further, I will use the well established markers CD4, CD25, CD127, FoxP3, IL-10 and TGF-β to phenotype regulatory T-cells. In addition, I will measure the expression of the activation marker CD69 on effector T cells. Reduced expression of this marker in the presence of T-regulatory cells is indicative of T-regulatory cell suppressive capacity.

Later, I want to follow the maturation of regulatory B-cells and T-cells in children, from birth to 5 years of age, and investigate possible correlations with EBV-viral infection, gut flora compostion and allergy development.

The antibodies in the IT-Box-139 from ImmunoTools would give me the possibility to stain the cells for larger screening panels, which would be of great importance since the sample size from each child in the cohort is small. The IT-Box-139 contains several antibodies that I intend to use in my panels and the box would help me to optimize my current panels. It would also give me a great opportunity to evaluate markers that I have not yet

tested: CD10, CD25, CD27, CD38, CD45RB and CD69. In addition, I would have the possibility to evaluate intracellular IL-10 production in other cell subsets like monocytes (CD14, CD16) and NK-cells (CD3, CD56).