ImmunoTools IT-Box-139 Award 2013

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The role Prostaglandin D_2 on monocyte/macrophage differentiation and function

Monocytes and macrophages are cells of the mononuclear phagocytic system and arise from common hematopoietic stem cell precursors in the bone marrow. After their recruitment to the peripheral blood system, they circulate there as monocytes. Stimulation can drive their differentiation into macrophages and their following migration to various tissues and organs. Macrophages are not only important effector cells of the primary immune response, but can be further portrayed by a complexity of functions such as maintenance of tissue homeostasis and tissue repair, as well as promotion and inhibition of inflammatory processes.

Prostaglandin (PG) D_2 is a lipid mediator that plays a crucial role in inflammatory processes that occur during allergic reactions. The role of PGD_2 in inflammation is conflicting, by eliciting both pro- and anti-inflammatory reactions depending on the cell type and receptors involved. As yet, the understanding of its actions on monocytes and macrophages is only modest and mainly depending on research using mouse models.

Therefore, the aim of this study is to investigate the role of PGD_2 receptors in the function of primary human monocytes and macrophages. To this end, human monocytes are isolated from peripheral blood and differentiated into macrophages *in vitro*.

Both classically and alternatively activated macrophages – displaying the two extreme forms of polarization – are associated with inflammatory processes in allergic airway diseases and asthma. Since PGD_2 is mainly released after allergen exposure and crosslinking of IgE by mast cells, we want to evaluate the ability of PGD_2 in activating and priming macrophages.

During the process of macrophage activation, macrophages change their cell surface receptor expression to adapt to the needs of the environment. Inappropriate macrophage activation can lead to pathophysiological consequences resulting in tissue damage and the persistence of the disease. Therefore, the effect of PGD_2 on macrophage activation will be determined. To this end the "ImmunoTools *IT-Box-139*" antibodies will be used to characterize different forms of activated macrophages and to indentify the phenotype that is induced by high environmental concentrations of PGD_2. Since cell surface receptor expression is one crucial way of characterizing activated macrophages the "ImmunoTools *IT-Box-139*" will be beneficial during this study.

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ImmunoTools *IT-Box-139.3* for **Katharina Jandl** includes 100 antibodies

FITC - conjugated anti-human CD1a, CD2, CD3, CD4, CD5, CD6, CD7, CD8, CD9, CD11a, CD11b, CD14, CD15, CD16, CD18, CD19, CD21, CD25, CD29, CD36, CD41a, CD43, CD45, CD45RA, CD46, CD52, CD53, CD54, CD58, CD62p, CD63, CD69, CD71, CD80, CD86, CD95, CD235a, HLA-ABC, HLA-DR, IL-6, Control-IgG1, Control-IgG2a, Control-IgG2b, Annexin V

PE - conjugated anti-human CD2, CD3, CD4, CD8, CD11b, CD14, CD15, CD18, CD19, CD20, CD21, CD22, CD27, CD33, CD34, CD37, CD38, CD40, CD42b, CD45, CD45RB, CD50, CD72, CD95, CD105, CD147, CD177, Control-IgG1, Control-IgG2a, Control-IgG2b, Annexin V

PE/Dy647 -tandem conjugated anti-human CD45

APC -conjugated anti-human CD3, CD4, CD7, CD8, CD10, CD11c, CD14, CD16, CD19, CD27, CD37, CD40, CD44, CD56, CD59, CD61, CD62L, CD62P, CD69, IL-6, Control-IgG1, Control-IgG2a, Control-IgG2b, Annexin V DETAILS

plus CD31 PE, HLA-ABC

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