# ImmunoTools IT-Box-139 Award 2012

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## Harnessing NKT cells for the reduction of atherosclerosis.

Given the lipid related "nature" of atherosclerosis with cholesterol rich lipoproteins identified as the main trigger of the immunoinflammatory response and of the polarization of lymphocyte T naïve cells toward an effector memory phenotype, a lot of interest have been raised toward the role of natural killer T cells (NKT) in atherogenesis. The observed ability of NKT cells to promote the maturation of dendritic cells toward inflammatory or tolerogenic phenotype (depending on the co-stimulatory signals) further increases this interest, as the loss of tolerance to lipoproteins is currently considered as a possible cause of atherosclerosis development. Thus, modulation of responses of iNKT cell subsets is under intensive investigation because this work may lead to a therapeutic approach to treat atherosclerosis.

The goals of my project are:

1. To investigate whether iNKT cell numbers (and their functions) and the ratios of specific iNKT cell subsets (CD4/CD8/CD56/CD161) differ between patients with familial hypercholesterolemia (FH) and healthy individuals.
2. To test (using *in vitro* cell culture conditions) the effect of lipoproteins on the activation of different iNKT cell subsets by dendritic cells pulsed with $\alpha$-galcer, on the expression of lipid presenting molecules (CD1a,b,c,d) and on the expression of co-stimulatory molecules (CD40, CD80, CD86, CD274, CD275) by antigen presenting cells (dendritic cells, macrophages, B cells).
3. To determine the effect of ($\alpha$-galcer+LDL)-pulsed dendritic cells on atherosclerosis in mice models of atherosclerosis (under different conditions of toll-like receptor stimulation).

I am entering the second year of my PhD program. During the first year I focused my attention on iNKT cell subsets in patients with familial hypercholesterolemia (FH).

For iNKT subset characterization we are using CD3, CD4, CD8 and 6B11 antibodies. We would like to extend this characterization by including CD45RA, CD45RO, CD62L, CD56, CD16 and CD161 to further assess the functional differences among iNKT subsets. To analyze monocyte-derived dendritic cells we are using CD11c and HLA-DR and CD1a, CD1b, CD1c, CD1d. We plan to include CD40, CD80, CD86 and others to assess the expression of costimulatory molecules. We would also use control antibodies available at ImmunoTools box-139.

**ImmunoTools** IT-Box-139 for Sergey Bondarenko include 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