ImmunoTools IT-Box-139 Award 2012

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Role of exosomes in immune activation and regulation

Exosomes are nano-vesicles with a diameter from 30 to 90nm which are released into the extracellular space where they act as an important tool for cell-cell communication. They are produced in the endosome by budding of the endosomal membrane. This results in the formation of multivesicular bodies (MVB). After fusion of MVB with the plasma membrane, exosomes are released into the extracellular space. Due to their endosomal origin they contain different cell derived proteins on the surface and in the lumen, which enables them to have important biological functions.

The main goal of the PhD thesis is to investigate the role of exosomes in the immune system, their role in cell-cell communication in different diseases such as cancer, to use them as a biomarker and to investigate how they can be used as therapeutic tools.

Exosomes released from APCs express MHC class I and II as well as co-stimulatory molecules. Exosomes have several functions in common with the cells that they originate from. While exosomes from APC are immunostimulatory, milk-, cancer cell derived exosomes and gut epithelium derived exosomes are instead tolerogenic. Exosomes loaded with tumor antigens have been shown to stimulate $CD4^+$ T cell clones in vitro.

To characterize exosomes and determine different molecules on the surface we coat them to beads covered with anti-tetraspanin (CD9, CD63, CD81) antibodies. Exosomes bound to the beads are then stained for different surface markers.

Another possiblity to characterize exosomes is a nanoparticle tracking system, which visualizes, measures and characterizes nanoparticles. In combination with a 488nm laser the percentage of exosomes positive for a certain marker can be investigated.

ImmunoTools IT-Box-139 for Stefanie Hiltbrunner 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