ImmunoTools *special* Award 2014

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Regulation of leukocyte adhesion by integrin phosphorylation

Leukocyte adhesion is of pivotal importance for our well- being. If white blood cells cannot adhere because of genetic deficiency of a functioning leukocyte integrins, the affected children die early because of infections.

Our research group has for a long time studied how leukocyte integrin activity is regulated. These adhesion proteins are expressed at the cell surface but normally they are not active. The leukocyte specific integrins include LFA-1, Mac-1, alphaX/beta2 and alphaD/beta2. In addition leukocytes contain several beta1-integrins including the alpha4/beta1 integrin (VLA-4). The beta2-integrins can be activated by several means for example by chemokines or through the T cell receptor.

We have identified the phosphorylation sites in the alpha- and beta-chains of the integrins. Important phosphorylation sites are threonines-758 and -759 in the beta2-chain. When these are mutated activity is often lost. The beta2-chain mediates signalling by binding of the phosphorylated threonine-758 to 14-3-3 proteins followed by binding of the adaptor protein Tiam1 followed by binding of the small G protein Rac-1. This results in reorganization of the actin cytoskeleton. When the alpha-chain single phosphorylation sites on serine residues are mutated, adhesion is inhibited.

The results show that the two integrin polypeptides must cooperate to induce adhesion. Furthermore, we have found that the beta2-integrins mediate signalling to the VLA-4 integrin in a given cell. This signalling is mediated by the beta2-chain but alpha-chain phosphorylation is needed.

We use a lot of chemokines, growth factors and antibodies for our research. Some of these reagents we make ourselves, but many are bought from commercial companies. The reagents that we have selected from the ImmunoTools list are such ones that we often use for cell culture, flow cytometry analysis, immunoprecipitation, blotting etc.

ImmunoTools *special* AWARD for **Carl G. Gahmberg** includes 22 reagents

FITC - conjugated anti-human CD3, CD11a, CD11b, CD18, CD29, CD43, CD45, CD54, Control-IgG1,

PE - conjugated anti-human CD11a, CD11b, CD11c, CD18, CD43, CD45,

recombinant human cytokines: rh G-CSF, rh IL-2, rh IL-17A, rh RANTES / CCL5, rh SDF-1α / CXCL12a, rh SDF-1β /CXCL12b, rh TNFα DETAILS more AWARDS