

## MCB Internship project 4:



### ICAM-1 dynamics upon leukocyte adhesion

**Introduction:** Our group studies the mechanisms that leukocytes use to find their way across the vessel wall. From our previous work and that of others, we know that adherent leukocytes induce intracellular signalling into the endothelium that ultimately control the passage of leukocytes. Our research group is dedicated to find out what signals are induced and help a leukocyte to cross the endothelial barrier.

**Aim:** The main goal is to unravel the signaling routes that are induced in the endothelium by adherent leukocytes. This signaling induces formation of docking structures and is required for proper diapedesis. The signaling induced by clustering of adhesion molecules such as ICAM-1 and VCAM-1 is analyzed using real-time fluorescence microscopy in combination with physiological flow as well as by biochemical and cell biological assays.

**Techniques:** Students will be trained to generate fusion proteins using molecular biology, including PCR and cloning of constructs. In addition, expression will be checked using Western blotting and SDS-PAGE. Also, the student will be trained to operate the confocal laser scanning microscopy to make real-time recordings of fluorescently-tagged ICAM-1/VCAM-1 distribution together with RFP-Lifeact to monitor the actin cytoskeleton. Primary leukocytes such as neutrophils or monocytes will be used to induce ICAM-1/LFA-1/Mac-1 or VCAM-1/VLA-4 interactions. If time allows, the student will be trained to isolate primary neutrophils from healthy human peripheral blood.

**Duration:** at least 6 months. Students from the University or HLO who are looking for a dynamic and interesting internship and are interested in the above project are encouraged to contact the group leader, Jaap van Buul, either by e-mail: [j.vanbuul@sanquin.nl](mailto:j.vanbuul@sanquin.nl) or phone: 020-5121219.