

Microfluidic Adhesion Assay Reveals Catch Bond Activated CD44-Hyaluron Interaction in Leukemic Cells

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A microfluidic adhesion assay has been developed and used to quantitatively investigate the interaction of leukemic cells with synthetic hyaluronan. Hyaluronic acid is found in all tissues and body fluids of vertebrates. It not only a major component of e.g. the ECM, but it can also be a ligand for receptors such as RHAMM or in our case more interestingly CD44.^[1] To characterise and further analyse the interaction of this receptor with the commonly expressed glycosaminoglycan hyaluronic acid, a self-built microfluidic shear force setup^[2] was applied. This setup allows visual analysis of adhesive effects on surfaces under biologically compatible conditions. We found that beyond a critical shear stress the cell surface receptor CD44 is capable of undergoing a catch bond-like, flow induced rolling effect^[3] similar to that of leukocytes during the extravasation process.^[4] This and the fact that it is found on haematopoietic stem and progenitor cells gives rise to the assumption that it could be involved in the process of stem cell homing or differentiation.

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