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## Improved adhesion of adult derived human liver stem cells (ADHLSCs) to endothelial cells by culture on thermosensitive polymer

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ADHLSC infusions are undergoing clinical trials. As many MSCs, they are both facing low engraftment levels. MSCs appear to use a mechanism of rolling and firm adhesion similar to leukocytes to engraft in organs. They mainly use the couple of integrins VLA-4 to bind VCAM-1 on the endothelium and transigrate as they do not express the other molecules involved in the process. Unfortunately, ADHLSCs express VLA-4 to a slight degree. Here we investigated the benefit of using alternative methods to culture and harvest ADHLSCs in order to avoid trypsinization. ADHLSC were cultured on a thermosensitive polymer and/or harvested using a non-enzymatic dissociation solution (NEDS) and their adhesion properties were compared to that of control cells cultured on CellBind® and harvested by trypsinization. Interestingly, we observed in a shear stress adhesion test a 44% increase of in the adhesion to VCAM-1 after culture on thermosensitive polymer combined with harvesting with NEDS compared to the control condition ( $P < 0.001$ ). Similarly, adhesion to non-activated HUVEC was increased by 3.2 fold change after Polymer and NEDS compared to CB and Trypsin ( $P < 0.001$ ). However, no significant differences were found when the test was performed on TNF $\alpha$ -activated HUVECs. Together, these results suggest that the culture condition Polymer NEDS has a benefic effect on the adhesion of ADHLSCs to endothelial proteins, particularly under normal conditions where these proteins are expressed at a lower level. These culture conditions could be used clinically in stem cells therapy, to improve the engraftment of the cells especially in the context of non-inflammatory diseases.

### Biography

Pierre-Edouard Dollet is a Young Researcher in the stem cell therapy field. He has performed his Master degree Internship at Promethera Biosciences to study the feasibility of using a bioreactor to culture the liver stem cells. Presently, he has been studying the engraftment process of the liver stem cells during infusion and trying to improve it in a PhD program at Université Catholique de Louvain of Bruxelles.

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