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## Human adipose stem cells cultured with novel wood derived nanofibrillar cellulose

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S tem cell transplantation has shown promise to promote wound healing. In the wound, stem cells could regulate inflammation and secrete supportive growth factors and thus, endorse tissue homeostasis and regeneration of the injured tissue. However, transplanted stem cells usually show limited survival due to the hostile environment in injured tissue. In addition, transplanted stem cells may be lost due to compromised attachment and spreading. Therefore, stem cell survival and retention are subjects to be improved towards successful cell therapy. The aim of this project is to study interactions between human adipose stem cells (hASCs) and a novel wood derived nanofibrillar cellulose (NFC) materials and signaling pathways involved in stimulation of hASCs, in order to develop cell transplantation methods for wound care. Adipose stem cells are multipotent cells from mesenchymal origin that are easily available from subcutaneous adipose tissue by a lipoaspiration procedure. During the project, hASC characteristics will be evaluated when cultured on NFC membrane or embedded into NFC hydrogel. Results show that culturing of hASCs on NFC membrane maintains cell characteristics and survival. The use of mechanical strength during the delivery may enhance cell retention. Thus, hASC culturing on NFC membrane that could be used as a dressing material for wound treatment may serve as an efficient delivery method into the wound. On the other hand, culturing of stem cells in three-dimensional environment could improve cell retention and survival. Moreover, the knowledge of signaling pathways that stimulate hASCs is of importance for preconditioning of cells prior to transplantation.

## **Biography**

Raili Koivuniemi has completed her PhD from Faculty of Biosciences, University of Helsinki in 2013. Presently, she works as a Postdoctoral researcher at Division of Pharmaceutical Biosciences, University of Helsinki, Finland.

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