

Self-assembled bioactive hydrogels (extension)

Initiative: Komplexe Materialien (beendet)

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This proposal concerns the application of dynamic bioactive surface structures on elastomeric substrates to study the adhesion and proliferation of soft tissue cells. Two complementary systems, star shaped reactive poly(ethylene glycol) (PEG) prepolymers and carboxymethylated dextran that can be used separately or in combination, will be applied onto and used as flexible substrates and will be modified with different amounts of cell adhesions peptides. By combination of lithographic techniques, block copolymer templating and microcontact printing the concentration of the peptides can be controlled over length scales ranging from several nanometers up to a few micrometers. Adhesion and proliferation of soft tissue cells on these substrates especially upon mechanical stimulation will be analyzed. Novel mechanically responsive hybrid PEG - coiled coil conjugates will be synthesized and bound to the hydrogels. In addition, the substrates will be modified with binding sites for cell secreted fibronectin. The deformable and mechanically responsive substrates will induce extracellular matrix (ECM) production of adherent cells and enable them to mechanically and thereby chemically condition their environment.

Projektbeteiligte

Prof. Dr. Martin Möller

Rheinisch-Westfälische
Technische Hochschule Aachen
Institut für Technische und Makromolekulare Chemie
Lehrstuhl für Textilchemie und
Makromolekulare Chemie
Aachen

Prof. Dr. August Bernd

Universität Frankfurt am Main
Klinikum
Zentrum für Dermatologie und Venerologie
Frankfurt/Main

Prof. Dr. Harm-Anton Klok

École Polytechnique Fédérale
de Lausanne (EPFL)
Institut des Matériaux
Laboratoire des Polymères
STI - IMX - LP
Lausanne
Schweiz

Prof. Dr. Joachim Spatz

Universität Heidelberg

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Heidelberg