BIOCOMPATIBILITY ASSESSMENT OF CYCLOPROPYLAMINE PLASMA POLYMERS STUDIED BY COHERENCE-CONTROLLED HOLOGRAPHIC MICROSCOPY

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1. ABSTRACT:

The understanding of the surface-cell interaction plays important role for the biomaterials development and bioengineering. We present the Coherence-Controlled Holographic Microscope (CCHM) built in Brno University of Technology as a tool for a reliable assessment of the biocompatibility of the amine-rich coatings [1].

Although it is already known that amine groups increase the cell adhesion and proliferation, the influence of the amine layers properties on cell adhesion need to be further investigated. Imaging and assessment of surface-cell interaction is an arduous task, since the cells are weakly scattering and absorbing specimens. The CCHM enables to acquire speckle-free optically-sectioned quantitative phase images of live cells in high contrast without using any labels [2]. The phase image contains quantitative information, from which valuable parameters directly related to the cell mass can be obtained. Based on those parameters, the biocompatibility of the surfaces is evaluated.

The stable amine-rich coatings were prepared by low pressure plasma polymerization of cyclopropylamine using radio frequency capacitively coupled discharge. The normal human dermal fibroblasts were plated on sterilized plasma treated coverslips and cultivated for 2 days. The cell-surface interaction was imaged by the Coherence-Controlled Holographic Microscope and biocompatibility was assessed. Results show that amine-rich films proved to act as biocompatible surfaces that enhanced cells adhesion and proliferation.

2. REFERENCES:

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