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Fibronectin adsorption on electronically nanostructured biomaterial surfaces

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Immediately after the incorporation of an implant into the human body the extracellular matrix (ECM) is formed at the biomaterial surface. Fibronectin (FN) as a component of the ECM plays an important role in cell adhesion, growth, migration and differentiation. The cell-biomaterial interaction is mainly mediated by FN via linking of the cells integrin receptors to the ECM. Therefore, the initial adsorption of FN at the biomaterial surface forms a basis for a successful settlement of cells and subsequent regeneration of tissue. We use silicon wafers with shallow n^+ (P)-p (B) doping line lattices of 260nm pitch as a model system in order to vary the electrostatic properties of the biomaterial surface in a defined manner and to investigate the influence of electrostatic forces on the adsorption mechanism of FN. The amount of adsorbed FN at the electronically nanostructured surfaces is determined by means of the enzyme-linked immunosorbent assay (ELISA) and compared to unstructured references. The immunostaining results are compared to the surface energy of the specimens calculated from contact angle measurements.

Biography

Andreas Kortge has obtained his M.Sc. at the University of Rostock in 2011. Currently he is a PhD student in the Interface Research Group of the Institute of Electronic Appliances and Circuits at the University of Rostock. He has experience in the field of implant coating, biointerface analysis and nanobiomaterials. His research is focused on the interaction mechanisms of extracellular matrix proteins with nanostructured biomaterial surfaces.

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