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Abstract Juliane Ißle

Application of functionalized magnetic beads to produce structured surfaces for contacting living cells

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Artificial magnetic nanoparticles of 20–100nm diameter are applied to investigate the influences of different surfaces on cell growth. It is possible to functionalize those particles by binding for example growth or differentiation factors to their surfaces by carboxylic groups. Permalloy structures in the micrometer range are brought to a substrate by e-beam lithography and by a lift-off process afterwards. An external magnetic field polarizes the Permalloy and allows the deposition of the magnetic beads from the liquid phase in a well defined manner. This method deliveres a helpful tool to produce functionalized surfaces with different chemical and topographical properties, because it is easy to vary the concentration of the allocated biomolecules by external magnetic fields and different particle concentrations. Another advantage is that structures can be obtained without difficult chemical techniques of binding biomolecules to a biocompatible surface.