Seminar

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Nanoscale thermoresponsive coatings for cell and cell sheet regeneration

Thermoresponsive polymer film mediated cell growth and recovery has become a popular way to recover undamaged cells with cell to cell junctions and basally deposited extracellular matrix maintained, which can in-turn be used for tissue engineering purposes. pNIPAm (poly-N-isopropylacrylamide) is the thermoresponsive polymer used in the majority of this type of research due to its physiologically relevant transition temperature of ≈32 °C. It has been shown that pNIPAm surfaces are generally non-conducive to reasonable cell growth. This issue has been overcome using many different approaches for example; Okano et al. have grafted pNIPAm onto substrates using electron beam polymerization to yield an ultra-thin layer of pNIPAm. Alternatively, the addition of an over-layer of cell adhesion promoting proteins onto a pNIPAm film negates pNIPAm's adverse effect on cell adhesion. Our research seeks to offer an accessible, facile and economically viable alternative to methods proposed elsewhere. By employing the dynamic spin coating deposition technique it is possible to avoid complex and expensive grafting techniques to create thin pNIPAm based films for cell regeneration. Furthermore, it is preferable to avoid the use of animal based proteins due to the associated disease transfer risks. The development of reproducible and robust techniques for cell and cell sheet harvesting provides a wide scope of opportunity in regenerative medicine. Such developments correspond to priority areas in biomedical research.

Wednesday, June 27th, 14h15

Hörsaal Makromolekulare Chemie, Stefan-Meier-Str. 31

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