

書報討論專題演講 Department Seminar



李泉 教授

國立陽明大學生物醫學工學系

The Regulation of Osteogenesis Using Electroactive Polypyrrole Films

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Abstract

To evaluate the effect of electrical conductivity of biomaterials on osteogenesis, polypyrrole was fabricated by oxidative chemical polymerization as substrates for cell culture. Through adjusting the concentrations of monomer and initiator, polypyrrole films with different electrical conductivities were fabricated. These fabricated polypyrrole films are transparent enough for optical microscopy easily. Fourier transform infrared spectroscopy, X-ray spectroscopy and four-point probe were used to assess the microstructures, surface chemical compositions and electrical sheet resistance of films. Results indicate that higher monomer and initiator concentration leads to highly cross-linked PPy chains and thus promotes the electron mobility and electrical conductivity. Selected polypyrrole films then were applied for culturing rat bone marrow stromal cells. MTT and Ca-oCPC assays reveal that not only these films are biocompatible, but also capable of enhancing the calcium deposition or mineralization into the extra cellular matrix by the differentiated cells.

Speaker Biography

- Professor in National Yang Ming University, Taiwan, 2014 – Present
- Associate/Full Professor in National Central University, Taiwan, 2009 – 2014
- Associate Professor in Nanyang Technology University, Singapore, 2000 – 2009
- CAE Project Engineer in DAIMLERCHRYSLER CORPORATION, USA, 1999 – 2000
- Project Engineer in FORD MOTOR COMPANY, Dearborn, MI, USA, 1998 – 1999
- Ph.D. in Mechanical Engineering and Applied Mechanics, The University of Michigan, Ann Arbor, MI, USA, 1998
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