



The
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Faculty
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Sheffield Engineering Scholarships

PhD full-fees scholarship for China Scholarships Council scholars from Zhejiang University

Project: *Controlled-differentiation and protein secretions of mesenchymal stem cells in a bioreactor*

Controlled-differentiation of mesenchymal stem cells (MSC) presents an area with exciting adventures and potential for regenerating living tissues/organs. To achieve this goal, there is a need to devise an environment appropriate for the studies of MSC activities and more importantly, one that is conducive for the controlled-differentiation of MSC. This project aims to understand and devise stimulation regime for controlled-differentiation and protein secretions of MSC targeting angiogenesis and the development of cardiovascular tissues within a bioreactor. Based on the hypothesis that both biomechanical and biochemical cues are relevant in controlled-differentiation and protein secretions of MSC, the project involves (i) analysis and identification of the biomechanical factors and the selection of appropriate polymeric/biological matrices, (ii) design, set up and characterization of a bioreactor system capable of incorporating/reproducing the intended stimulating regime, (iii) perform MSC culture on selected matrices and execute parametric studies to understand the differentiation of, and proteins secretion by MSC and hence propose the mechanisms involved. The project is primarily laboratory-based, but computational modeling may also be employed. This project is highly multidisciplinary and will allow student to work at the interface between engineering and life sciences.

Supervisors: Dr C K Chong (Engineering Materials)

Scholarship: Sheffield Engineering scholarships cover the full cost of PhD registration fees for 3 years

Eligibility: Sheffield Engineering scholarships are available to students who secure a CSC scholarship. Applicants must meet the University of Sheffield English Language requirements, full details of which are available at:

<http://www.shef.ac.uk/postgraduate/info/englang.html>

Applications: Please send a CV together with a brief covering letter to Dr Catherine Biggs, Faculty of Engineering Head of Research Studies at c.biggs@sheffield.ac.uk by **17th Feb 2010**. Include the title of the project in your covering letter and any English language test results.