

>>> ANNOUNCEMENT



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Quo vadis biofabrication – innovative biomaterials technology platforms warranted to enhance current bioprinting

ABSTRACT

Additive Tissue Manufacturing for Soft Tissue Interfaces with a focus on Breast Reconstruction; combining computer aided design and manufacturing with adipose tissue engineering - A Hans Fischer Senior Fellowship Project at the Technical University Munich: Breast cancer is a major cause of illness for women. Following tumour resection, breast reconstruction is undertaken for cosmetic and psychological reasons. Reconstruction using silicone-based implants leads to complications such as formation of a rigid fibrous tissue surrounding the implant giving a spherical and unnatural appearance to the breast. Reconstruction using autologous tissue is associated with donor site morbidity, tissue resorption and necrosis. It has been hypothesised that these problems may be overcome with a tissue engineering approach. However, most large volume tissue engineering scaffolds develop a necrotic core due to inefficient nutrient diffusion. This project proposes a novel method having a combination of perfusable channels within a patient-specific scaffold that will allow continuous provision of nutrients and oxygen to the cells at the core of the scaffold and significantly lowers the possibility of cell death due to hypoxia. In addition, the lack of functional integration between tissue-engineered constructs (TEC's) and surrounding host tissues is a critical barrier, limiting the effectiveness and clinical translation of current soft tissue interface graft technologies. The overarching goal of this Hans Fischer Senior Fellowship research programme is to address this challenge through the development of highly adaptable platform technologies that enable the engineering of stronger interfaces between TEC's and the extracellular matrices that are distinct to particular clinical conditions. Through this project, an international network spanning scientists, engineers, clinicians, industry and government will be established to accelerate the pace of regenerative medicine research targeting reconstruction of complex soft tissue interface defects and abnormalities. Key outcomes of the Hans Fischer Senior fellowship program will deliver innovative new strategies for Additive Tissue Manufacturing for Soft Tissue Interfaces whilst contributing to the education at the TU Munich of a new generation of bioengineers, clinician scientists and tissue engineers with a strong international profile.

BIO

- 2008 – Present** Adjunct Professor at Georgia Institute of Technology, USA
- 2007 – Present** Professor and Chair Regenerative Medicine, Institute of Biomedical Innovation, QUT, Brisbane, Australia
Main Research Areas: Bone Tissue Engineering, Establishment and Validation of Large Preclinical Animal Models and Translation of Tissue Engineering Technology Platforms into Cancer Research
- 2005 – 2007** Joint Appointment as Associate Professor (Tenure), Division of Bioengineering, Department of Orthopedic Surgery, National University of Singapore
- 2001 – 2005** Joint Appointment as Assistant Professor, Division of Bioengineering, Department of Orthopedic Surgery, National University of Singapore
- 1999 – 2001** Senior Research Fellow, National University of Singapore
- 1998 – 1999** Managing Director, Medical Monitor GmbH
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