

# Chemical Engineering Seminars – TT 2010

*Week 6, Tuesday June 1<sup>st</sup> 2010, 4:00PM-5:00PM  
Lecture Room 2, Thom Building, Engineering Science*

## **From crop to clinic: regenerative medicine process design**

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### Abstract

Due to the demographic changes in the age profile of the UK population there is a need to improve treatments for age-related health conditions, to allow our senior citizens to remain active and healthy. In addition, injuries at an early age can cause reduced function at the site of injury and additional loss of function elsewhere can cause problems in even simple day-to-day activities in later life. Tissue engineering technologies show promise to deliver solutions to aid healing and therefore restore function which will allow patients to maintain normal and healthy levels of activity. There is a recognised need for the development of 'industrial scale' systems to make tissue engineering a viable option in medicine; for example devices to obtain enough cells to restore tissue function and reproducible tissue engineered constructs that provide the necessary signals for healing. To address this need we are designing polymers to promote cell-material interactions, construct architectures to promote tissue healing, and bioreactors to prepare the constructs for implantation. This talk will describe results that will include the polymerization of controlled micro-structured poly(lactide-co-glycolide) using a zirconium catalyst; cell response to lactide-based hollow fibre and flat sheet membranes, and electrospun mats of aligned fibres with different physicochemical properties; and an approach to optimizing hollow fibre bioreactor operation for cell expansion, tissue engineering construct development, and as a bioartificial liver device.