New Therapies and Technologies

Tissue engineering and regeneration

February 13-17, 2012

Regenerative Medicine can be defined as the development and manipulation of laboratory-grown molecules, cells, tissues, or organs to repair, replace or support the function of defective or injured body parts. By working on the development of novel cell culture techniques and the design of bioactive functionalized materials, tissue Engineering strategies have recently emerged as one of the most advanced therapeutic options presently available in regenerative medicine. The combination of Tissue Engineering with drug and gene delivery strategies could provide in situ and in a temporal, spatial and targeted manner the physiological concentrations of signaling molecules required for tissue regeneration.

In this module the main components of this new therapeutic approach will be presented and a number of examples discussed.

Specific topics of the program include:

- An introduction to tissue engineering
- Fundamentals of biomaterials science and engineering
- Stem Cells in Regenerative Biology and Medicine
- Cell-material interactions at the molecular level
- Bioreactors
- Examples of application

Invited Speakers

Ana Paula Pêgo
INEB, NEWTherapies Group, Universidade do Porto, Portugal
"Introduction to biomaterials and tissue engineering"
"Nanotechnology at the service of nerve regeneration - a "small" contribution to a larger end"

Arti Ahluwalia
Centro Interdipartimentale di Ricerca "E. Piaggio" - Faculty of Engineering, University of Pisa, Italy
"Introduction to bioreactors for cell culture"
"Engineering physiologically relevant environments *in vitro*"

Meriem Lamghari
INEB, NEWTherapies Group, Universidade do Porto, Portugal
"The concept of neuro-osteogenesis and its relevance in bone biology"

Mª Cristina L Martins
INEB, NEWTherapies Group, Universidade do Porto, Portugal
"Engineering surfaces to modulate biological responses"

Pedro Granja
INEB, NEWTherapies Group, Universidade do Porto, Portugal
“Biofunctional hydrogels for cell entrapment and delivery"

Perpétua do Ó
INEB, NEWTherapies Group, Universidade do Porto, Portugal
"At the Heart of The Stem Cell Biology Team"

Peter Dubruel
Polymer Chemistry and Biomaterials Group, University of Ghent, Belgium
"Surface Functionalized 3D porous polyesters as tissue engineering scaffolds"

Raquel Gonçalves
INEB, NEWTherapies Group, Universidade do Porto, Portugal
"Designing surfaces for hematopoietic stem cell expansion"

Carlos Sá
Centro de Materiais da Universidade do Porto, Porto, Portugal
Visit to CEMUP

Manela Brás, Ricardo Vidal and Susana Carrilho
INEB, Universidade do Porto, Portugal
Visit to INEB

Program

13 February	14 February	15 February	16 February	17 February
9:15-9:30 Welcome 9:30-10:30 **Ana Paula Pêgo** *Break* 11:00 -12:00 **Perpétua Pinto do Ó**	9:00-10:00 **Mª Cristina Martins** *Break* 10:15-11:15 *Break* **Meriem Lamghari** 11:30-12:30 **Meriem Lamghari**	11:30-13:00 **Visit to CEMUP**	**PROJECT**	**PROJECT**
14:00-15:00 **Perpétua Pinto do Ó** *Break* 15:15-16:15 **Peter Dubruel** *Break* 16:30-17:30 **Peter Dubruel**	14:30-15:30 **Pedro Granja** *Break* 15:45-16:45 **Pedro Granja**	14:00-15:00 **Arti Ahluwalia** *Break* 15:15 -16:15 **Arti Ahluwalia** *Break* 16:30-18:00 **Visit to INEB**	14:00-15:30 **Ana Paula Pêgo** *Break* 15:45-17:15 **Raquel Gonçalves**	**PROJECT PRESENTATION**

Note: All lectures will take place in the Main Auditorium of IBMC-INEB.