



TERMIS – EU SYMPOSIUM SUBMISSION FORM

Title:	BIOFUNCTIONAL MATERIALS AS EXTRACELLULAR SIGNALS TO PROMOTE TISSUE MORPHOGENESIS	
	Name	Affiliation
Chair:	Elisabeth Engel	Bio/Non-Bio interactions for regenerative medicine Institute for Bioengineering of Catalonia, Barcelona, Spain
Co-Chairs:	Josep A. Planell	Bio/Non-Bio interactions for regenerative medicine Institute for Bioengineering of Catalonia, Barcelona, Spain
Keynote Speaker *:	Abhay Pandit	Network of Excellence in Functional Biomaterials National University of Ireland, Galway, Ireland
Organizers:	Prof. Josep A. Planell Dr. Elisabeth Engel	Bio/Non-Bio interactions for regenerative medicine Institute for Bioengineering of Catalonia, Barcelona, Spain
Synopsis: Please provide a brief synopsis of the proposed symposium (up to 600 words). Please use allocated space below.		
<p>Regenerative medicine based on tissue engineering needs a step forward in biomaterials design coupled with a search for novel activities and evaluation of their behaviour in biological systems. The body's capacity to regenerate it is not well elucidated but several signals implicated in regeneration have been revealed already. Among all of them, signals connected to adult stem cells mobilization to the injury site and activation of the repair scheme as well as new tissue formation are the most relevant. The ability to direct stem or progenitor cell differentiation via a chemically/naturally synthesized biomaterial, without the need to incorporate growth factors or other molecules that might induce undesirable effects, offers many potential advantages in regenerative medicine. The properties of the own materials are the ones that stimulate cells to produce the appropriate chemokines and growth factors to promote cell activation. This activation can be the mobilization of stem cells out of its niche to go to the injured tissue. At the injured site, cells will produce the molecules to induce tissue repair. For example, ion release can induce this mobilization and call the progenitors to the implant site.</p> <p>Besides chemical signalling we have to take into account the physical signalling to induce the most appropriate response of the surrounding cells. Surface topography has been demonstrated to have an effect in several biological activities, as cell adhesion, migration, proliferation and differentiation. But we cannot forget the mechanical properties of the biomaterials, as it has been already demonstrated. The surface stiffness plays a definite role in stem cell differentiation, when mimicking the tissue stiffness.</p> <p>Thus, inflammation is also a mechanism in tissue repair. The use of biomaterials that could modulate inflammatory responses to avoid chronic inflammatory responses (characterized by leukocyte adhesion and fibrous encapsulation) but promoting a signalling cascade that will induce tissue formation is also a major issue in tissue engineering.</p> <p>This holistic view will be the next generation of biomaterials to be applied in advanced therapies to treat diseases related to tissue degeneration. The properties of the biomaterials will conduct the own body repair.</p>		
Symposium Keywords:	Bioactivity / Signalling / stem cells activation / surface chemical and physical properties / mechanical properties	

***The Keynote Speaker needs to be confirmed at the time of the proposal**