

IBEC participates in "la Caixa" Fellowship Programme with a set of **stimulating PhD projects** and **excellent research groups** to host the fellows



Biomaterial for regenerative therapies group

Group leader: Elisabeth Engel

Instructive microenvironments for cardiac regeneration

Research in the Biomaterials for Regenerative Therapies group is devoted to the development of basic science and knowledge transfer to industry of innovative biomaterials and scaffolds for tissue regeneration. We work on the interface of biomaterials and cell biology elucidating the effect of the produced scaffolds on stem cell activation. The mammalian heart has been considered a post-mitotic terminally differentiated organ, in which cardiomyocytes present at birth would persist, without further division, throughout the life of the organism.

The recent identification and characterization of resident cardiac stem cells (CSCs) changed completely the classic view of the heart as a postmitotic organ. These findings open the possibility of the heart self-healing in response to specific stimuli after a heart infarction. However, other authors support that the activation of the molecular machinery in mice results in cardiomyocyte dedifferentiation and improved heart functionality after.

Given the prospect of true myocardial regeneration, the quest for potential strategies to induce in situ cell activation sources with myogenic and angiogenic properties is a great opportunity for myocardial tissue regeneration. InsBiomat aims the application of a new process for biomaterials fabrication (Organogels) as an in situ tissue engineering scaffold that due to its physicochemical properties is believed to have chemotactic attraction for cells and promote vascularization at the infarcted tissue. The project will explore the capability of these scaffolds as an in vivo cardiomyocytes reprogramming system.

Job position description

The person involved in this project will work on scaffolds design and fabrication. New technologies based on 3D printing will be the core of his/her research to produce appropriate scaffolds that will create a regenerative environment to control scar formation and cardiac tissue regeneration after ischemia. Cell culture and biochemistry techniques to characterize the obtained scaffold will also be part of his/her work. Scientific papers writing as well as conference attendance will be encouraged. International stays in other research centers are offered. Thus, a thorough formation in different skills (scientific writing, oral communication, IP protection, etc) will be offered by the institution.

The selected candidate will take part of a highly multidisciplinary team that combines bioengineers, chemist, cell biologists, and biotechnologist. This is a young team that highly collaborates in the group research trying to transform the health and wellness in our society by developing new treatments for diseases. The projects are fully applied and our aim is to promote technology transfer in science and into society.

Come and join a very dynamic team that will give you opportunity to make a change in our society.