

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



iPSCs and activation of endogenous tissue programs for organ regeneration group
Group leader: Nuria Montserrat (nmontserrat@ibecbarcelona.eu)

Targeting cardiac progenitors in human pluripotent stem cells (hPSCs): identification of novel non coding RNAs driving cardiac development and regeneration

Regenerative Medicine aims to restore the loss of function in tissues and organs by the formation of new functional structures. For that purpose regenerative medicine makes use of different methodologies: stem cells, animal models or gene therapy. Alongside this project we aim to identify long non-coding RNAs (lncRNAs) with a potential role in early steps of cardiac development. Top candidates will be identified by RNA Seq and subsequently validated in order to dissect their potential role in tissue differentiation. At the same time we sought to determine their functionality in vivo by using animal models of heart failure.

The main objectives of this project are as follows:

- 1) To identify the molecular (lncRNAs) and epigenetic mechanisms guiding mesoderm specification and cardiac differentiation using hPSCs. lncRNAs related to major changes during the onset of hPSCs differentiation towards cardiac lineage and cardiac progenitors will be correlated with epigenetic signatures and methylation landscapes genome wide.
- 2) lncRNAs identified in 1) will be further used in order to generate cellular models for the generation of cardiac progenitors from hPSCs
- 3) lncRNAs validated in 2) will be assayed for their potential role in tissue regeneration in vivo

Expected results: i) identification of molecular and epigenetic mechanisms driving early steps of cardiac differentiation using pluripotent stem cells ii) induction of tissue regeneration by lncRNAs involved in cardiac differentiation using animal models of heart failure.

Job position description

We are looking for highly motivated PhD students to work on the role of lncRNAs and epigenetic events occurring during human pluripotent stem cells commitment, lineage specification, differentiation and dedifferentiation in normal development and pathological alterations in the heart.

We use a wide range of biochemical, molecular/cell biological, embryological and genome engineering techniques to study the transcriptional and epigenetic networks in heart development and disease both in cell culture and in vivo . Applicants should possess a strong research background in molecular and cell biology. Specific experience in the fields of stem cells development/biology and/or epigenetics will be an advantage.