

IBEC participates in "la Caixa" 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

Targeting intermediate mesoderm in induced pluripotent stem cells (iPSCs): identification of novel non coding RNAs driving kidney 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 kidney development (i.e. intermediate mesoderm and kidney multipotent progenitors). Top candidates will be identified by RNA Seq and subsequently validated on induced pluripotent stem cells (iPSCs) in order to dissect their potential role in tissue differentiation. At the same time we sought to determine their functionality in vivo by using mice models of kidney injury.

The main objectives of this project are as follows:

- 1) To identify the molecular (lncRNAs) and epigenetic mechanisms guiding mesoderm specification and differentiation using iPSCs. lncRNAs related to major changes during the onset of iPSCs differentiation towards intermediate mesoderm and kidney multipotent 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 renal progenitors from iPSCs
- 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 kidney differentiation using pluripotent stem cells ii) induction of tissue regeneration by lncRNAs involved in kidney differentiation using mice models of tissue injury.

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 kidney.

We use a wide range of biochemical, molecular/ cell biological, embryological and genome engineering techniques to study the transcriptional and epigenetic networks in kidney 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.