

IBEC-SJD INTERNATIONAL PhD PROGRAMME

Position

1. Project Title/ Job Position title:

Epigenetic disruption of EWSR1-FLI1 reprogramming in Ewing Sarcoma

2. Research project/ Research Group description:

Ewing Sarcoma (EwS) is a rare pediatric disease cytogenetically determined by the chromosomal translocation EWSR1-FLI1. This translocation reorganizes chromatin acting as a pioneer transcription factor (TF) with capacity to open chromatin regions and activate super-enhancers (SEnh). EWSR1-FLI1 fusion protein may undergo phase separation, allowing an increase in the concentration of cofactors at SEnh necessary for oncogenic reprogramming. Pharmacological modulation of TFs is still challenging, and direct inhibitors of EWSR1-FLI1 have not yet reached the clinic. Leveraging from the deep knowledge of EWSR1-FLI1 chromatin remodeling we aim to disrupt the reprogramming infringed by the oncogene.

The research group will be coordinated by the PI from IBEC, Dr. Benedetta Bolognesi and the PI from IRSJD, Dr. Sánchez-Molina. IBEC would contribute by developing predictive models, building mutational libraries and analyzing the large datasets generated. IRSJD would provide the clinical and biological expertise to analyze chromatin in EwS in vitro and in vivo models.

Together, this collaboration could yield significant advancements in understanding this aggressive cancer and developing novel treatments as well as generating shared tools and databases, benefiting the broader research community in pediatric cancer biology.

3. Job position description:

The selected candidate will have the opportunity to enter a challenging and motivating research environment to develop his/her PhD in pediatric cancer.

Key responsibilities:

- Develop and optimize molecular biology techniques, CRISPR/Cas9 gene editing, RNA interference and flow cytometry analysis.
- Genome-wide data analysis including ATAC-seq, ChIP-seq and RNA-seq.
- Conduct experiments using pediatric cancer models both in vivo and in vitro.
- Contribute to the writing of scientific publications and the presentation of findings at conferences.

Candidate requirements:

- Bachelor's degree in Pharmacy, Biology, Biomedicine, Medicine, or related fields.
- Previous experience in the mentioned methodologies is welcome.

Desirable Qualities:

- High organizational and reporting skills.
- Ability to work independently and in collaboration with other researchers.
- Good communication in English, both orally and in written form for presenting research findings, writing papers, and engaging with the academic community.
- A proactive nature with critical thinking.
- Curiosity and passion for learning new techniques, methodologies, and knowledge throughout their PhD period.
- Perseverance and persistence in seeking solutions.

Group Leaders at IBEC

1. Title: PhD
2. Full name: Benedetta Bolognesi
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4. Research Group: Protein Phase Transitions in Health and Disease

Group Leader at SJD

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4. Research group: Pediatric Cancer (Sarcomas Group)