



Master project 2024-2025

Personal Information

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Group Biomedical Epigenomics

Project

Computational genomics

Project Title:

Defining the molecular mechanisms underlying the development and evolution of lymphoid tumors through single cell multi-omics

Keywords:

single cell RNA-seq, single cell ATAC-seq, lymphoma, computational biology

Summary:

In the context of an ERC synergy project the group has generated a vast amount of single cell multiomic data in samples with lymphoid tumors from patients with extensive biological and clinical metadata. The person that joins the group will work with a team of single cell computational biologists to develop one particular project within the large consortium. Several possibilities of projects will be initially presented to the master student, who will chose the one that he/she finds more appealing. The overall goal of the project is to explore the role of intraclonal heterogeneity and epigenetic regulation in the evolution and clinical behavior of these tumors.

References:

Some articles from the group related to the topic of the master thesis: 1. An atlas of cells in the human tonsil. Massoni-Badosa et al. *Immunity*. 2024 Feb 13;57(2):379-399.e18. 2. Epigenomic Characterization of Lymphoid Neoplasms. Duran-Ferrer M, Martín-Subero JI. *Annu Rev Pathol*. 2024 Jan 24;19:371-396. 3. Detection of early seeding of Richter transformation in chronic lymphocytic leukemia. Nadeu et al. *Nat Med*. 2022 Aug;28(8):1662-1671. 4, The proliferative history shapes the DNA methylome of B-cell tumors and predicts clinical outcome. Duran-Ferrer M, et al. *Nat Cancer*. 2020 Nov;1(11):1066-1081. 5.The reference epigenome and regulatory chromatin landscape of chronic lymphocytic leukemia. Beekman et al., *Nat Med*. 2018 Jun;24(6):868-880.

Expected skills:

Experience in computational genomics using R. Ideally experience in analyzing epigenomics and transcriptomic data. Strong motivation to carry out biomedical research in cancer with a translational impact..

Possibility of funding:

No

Possible continuity with PhD:

Yes

Comments:

As we expect that the person coming to the group will continue with a PhD thesis, a minimum average mark of 8.5 in the university degree is desirable.