EPFL

BIO-603(LG)   **Practical - LaManno Lab**

La Manno Gioele

Cursus	Sem.	Type
Molecular Life Sciences		Obl.

Language of teaching	English
Credits	1
Session	
Exam	Project report
Workload	30h
Hours	**24**
Courses	6
TP	18
Number of positions	**4**

Frequency

Every year

Remark

3-day Block course, every year in January. To register, contact EDMS Administration

Summary

Give students a feel for how single-cell genomics datasets are analyzed from raw data to data interpretation. Different steps of the analysis will be demonstrated and the most common statistical and bioinformatic techniques applied by the students. Data analysis in single-cell genomics.

Content

The students will be provided with a modest-sized single-cell transcriptomics raw dataset for without any biological context given initially. The students will learn how to use analysis tools and statistical methods to understand the biological process the dataset is capturing.
Starting from read-mapping, they will perform steps of data processing and quality control so to end up with a gene expression table.
On this data, the students will learn how to perform feature selection and data visualization. The combination of multivariate analysis routines and literature based search will lead to the an interpretation of the observed gene expression variation.

Note

Open to max. 4 students. Please note that you are not allowed to inscribe in your own group!

Keywords

single-cell, genomics, data analysis, transcriptomics

Learning Prerequisites

Required courses

A course that included python or R programming project.

Learning Outcomes

By the end of the course, the student must be able to:

• Perform a basic analysis of a single cell RNA-seq dataset autonomously

Assessment methods

Project report

Resources

Bibliography
Butler et al, Nature Biotechnology, 2018

Websites
- https://satijalab.org/seurat