

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
<b>Hours</b>	<b>24</b>
Lecture	6
Practical work	18
<b>Number of positions</b>	<b>4</b>

**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**

Please note that you are not allowed to inscribe in your own group!

Note that 3 practical courses are mandatory for all EDMS students and that they have the priority; each course has between 2 to 4 possible slots.

**Therefore, please do not register by yourself to this course, this will be done by the EDMS program administrator!**

**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>