## CIVIS Blended mobility project Virtual component

# Technical innovations in basic and translational research Applications to Immunology-Oncology

#### VIRTUAL COMPONENT OF THE BLENDED MOBILITY (5 COURSES)

#### Cytometry (mass, flow, spectral ...)

Theoretical principle of flow, spectral and mass cytometry; applications to the monitoring of immune responses in cancer patients.

#### Organoids

In vitro assays using new biological 3D models and examples of applications to drug screening for cancer patients.











#### Genomics (CRISPR, RNAseq, TCRseq ... )

Dissecting molecular mechanism of immune subversion.

#### **Proteomics**

Exploration of protein modification and applications to analysis of therapeutic antibodies and biomarkers.

#### Microscopy-Imaging

Visualization of cell-cell interactions using cryo-electron microscopy , 3D Super-resolution microscopy and intravital microscopy.

#### Genomics

## Hands-on introduction to RNA-Seq.

Sumeet Pal Singh MISU (FNRS) Fellow IRIBHM, ULB

https://sumeetpalsingh.github.io/





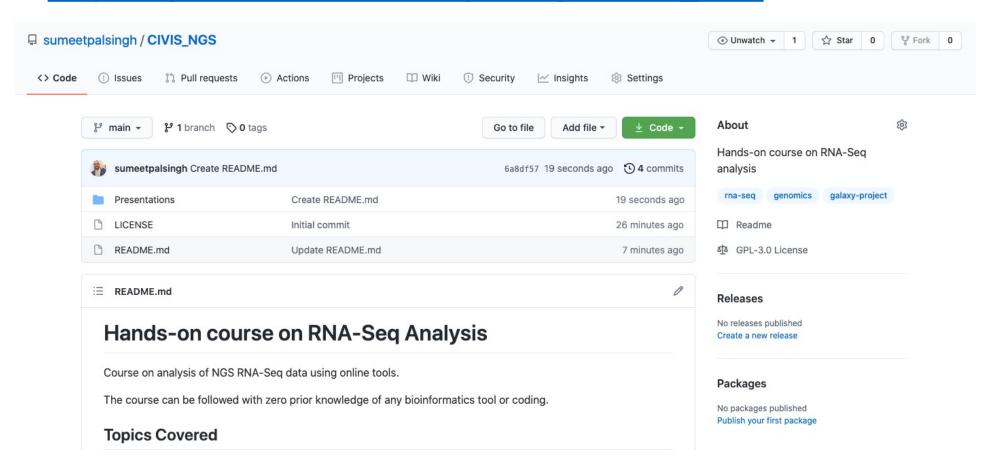
## Hands-on course

### Hands-on analysis of RNA-Seq count data

- Count Matrix
- Normalization
- Differential Gene Expression Analysis
- Representation of DGE (Volcano Plot)
- Functional Analysis (GO Terms)

## Module Repository

https://github.com/sumeetpalsingh/CIVIS NGS



#### RESEARCH ARTICLE

## Systems biological assessment of immunity to mild versus severe COVID-19 infection in humans

Prabhu S. Arunachalam<sup>1,\*</sup>, Proposition Proposition

+ See all authors and affiliations

Science 04 Sep 2020: Vol. 369, Issue 6508, pp. 1210-1220 DOI: 10.1126/science.abc6261

To investigate this further and to independently validate the observations in the CITE-seq analysis, we performed bulk RNA sequencing (RNA-seq) analysis of PBMCs in an extended group of subjects (17 COVID-19 patients and 17 healthy controls) from the same cohort. We first evaluated whether the ISG signature containing 33 genes identified in the CITE-seq data was also observed in the bulk RNA-seq dataset. We observed a strong induction

https://science.sciencemag.org/content/369/6508/1210