

Summer School on Chromatin Biology

Tamás Schauer

20.08.2024

Welcome to the Bioinformatics Part

Summer School on Chromatin Biology: A hands-on expedition

11–25 Aug 2024, Germany

Apply by April 5



abcam

HELMHOLTZ
MUNICH

Instructors

- ▶ Marika Friano (R/Bioconductor)
- ▶ Franziska Greulich (Motif analysis, R/Bioconductor)
- ▶ Elizabeth Márquez Gómez (VS Code, Command line)
- ▶ Marlies Oomen (Command Line, Deeptools)
- ▶ Gabriela Stefanie Santos (Snakemake, final project)
- ▶ Tamás Schauer (Data processing, peak finding, diff. analysis)

https://ascgitlab.helmholtz-muenchen.de/chromatin_summer_school_2024/wiki

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Project ID: 1438

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Welcome to the Helmholtz Summer School on Chromatin Biology: A hands-on expedition

Resources

- Cheat Sheets
- Visual Studio Code
- IGV Browser
- [R version 4.4.1] (<https://cran.r-project.org/>)
- [R studio version 2024.04.2+764] (<https://posit.co/download/rstudio-desktop/#download>)

Schedule

Tuesday (August 20th 2024)

- 9.00 Welcome (Tamas)
- 9.10 Reproducible Research (lecture, Tamas ~1hr)
- 10.30 Setup VS Code (workshop, Elizabeth ~30 min)
- 11.00 Introduction
 - Beginner (workshop, Elizabeth and Marlies ~1.5hr):
 - Introduction to the Command Line (Elizabeth)
 - HPC/slurm (Marlies), Conda (Marlies)
 - Snakemake short introduction (Elizabeth)
 - Experienced
 - Snakemake Tutorial (workshop, Gabriela and Tamas ~1.5hr)
- 12.30 Lunch
- 13.30 Seminar
- 14.30 Workflow Steps (lecture, Tamas ~1hr)
- 15.30 Data Processing (workshop, Tamas ~1.5hr)
 - Quality Control
 - Alignment
 - File formats

Tuesday

- ▶ Reproducible Research
- ▶ Setup VS Code
- ▶ Introduction
 - Beginner: `command line`
 - Experienced: `snakemake`
- ▶ Lunch
- ▶ Seminar
- ▶ Workflow Steps
- ▶ Data Processing workshop

Wednesday

- ▶ Snakemake Pipeline
- ▶ Chromatin Profiling Methods
- ▶ Deeptools
- ▶ Lunch
- ▶ Seminar
- ▶ Peak Finding workshop
- ▶ Motif Analysis workshop

Thursday

- ▶ R part I
- ▶ Lunch
- ▶ Seminar
- ▶ R part II
- ▶ Seminar

Friday

- ▶ Differential Analysis workshop
- ▶ Pipeline Results
- ▶ Lunch
- ▶ Seminar
- ▶ Final Project (talk preparation)

Saturday

► Student Talks

- 15 + 5 minutes per group
- present results of your data
- compare chromatin profiling methods
- focus on 2 topics in more details:
 - Quality Control (FastQC, MultiQC)
 - Fragment Size (short vs. mono-nucleosomal)
 - Visualization (DeepTools)
 - Peak finding (MacS2, Homer)
 - Motif analysis (Homer, Meme)
 - Differential Binding (DESeq2)

► Q&A