

SYSTEMS BIOLOGY WORKSHOP PROGRAM

MAY 13 – 18
2018

13.05

- 18:00 **Departure**
from Saint Petersburg
- 20:00 *Dinner*
- 21:00 **Opening.**
Workshop introduction

16.05

SCRNA-SEQ&PROTEOMICS

- 9:00 *Breakfast*
- 9:30 Introduction to scRNA-seq: difficulties to capture RNAs from single cells and how to overcome them | **Konstantin Zaitsev**
- 10:30 Visualization and clustering of scRNA-seq data | **Konstantin Zaitsev**
- 11:30 *Coffee break*
- 11:45 Differential expression and pathway enrichments in scRNA-seq data | **Konstantin Zaitsev**
- 12:45 Study case: scRNA-seq data to dissect tumor infiltrating lymphocytes changes upon check-point therapy | **Konstantin Zaitsev**
- 13:30 *Lunch*
- 15:00 Proteomics | **Marko Jovanovic&Sergey Djuranovic**
- 17:00 *Coffee Break*
- 17:15 Proteomics | **Marko Jovanovic&Sergey Djuranovic**
- 20:00 *Dinner*
- 21:00 Funny stories from Marko&Sergej at the house

14.05

MEDICAL GENETICS

- 9:00 *Breakfast*
- 9:30 Concepts of uncovering genotype-phenotype interactions | **Nikita Artomov**
- 10:30 Introduction to statistical genetics | **Nikita Artomov**
- 11:30 *Coffee break*
- 11:45 Hands-on tutorial: perform your own user-friendly GWAS | **Nikita Artomov**
- 13:30 *Lunch*
- 15:00 NGS: from raw sequencing reads to analysis-ready DNA variant calls | **Nikita Artomov**
- 17:00 *Coffee break*
- 17:15 Hands-on tutorial: Assessment of breast cancer risks in a family; Discovery of a new melanoma gene in large-scale case-control analysis | **Nikita Artomov**
- 20:00 *Dinner*
- 21:00 Informal lecture: "Immunology primer" | **Maxim Artyomov**

17.05

EPIGENETICS, TRANSCRIPTIONAL REGULATION, CHIP-SEQ

- 9:00 *Breakfast*
- 9:30 Lecture 1: Epigenetics and chromatin organization Eukaryotic genome packing and chromatin organisation. Bird's-eye view of transcriptional regulation | **Alexander Predeus**
- 11:30 *Coffee break*
- 11:55 Lecture 2: Biological interpretation of ChIP-Seq data Biological interpretation of ChIP-Seq data. The story of super-enhancers | **Alexander Predeus**
- 13:30 *Lunch*
- 15:00 Practice 1: Processing of ChIP-Seq experiments. Understanding ChIP-Seq data: quality control, basic processing, and peak calling of various chromatin marks | **Alexander Predeus**
- 17:15 Practice 2: How it all comes together. Integration of multiple types of data using ChromHMM. Using the ChIP-seq data to improve our understanding of immune response regulation | **Alexander Predeus**
- 20:00 *Dinner*
- 21:00 **Farewell party**

15.05

RNA-SEQ

- 9:00 *Breakfast*
- 9:30 Basic concepts and practical applications of RNA-seq | **Alexander Predeus**
- 10:30 Gene expression visualization and exploration | **Alexey Sergushichev**
- 11:30 *Coffee break*
- 11:45 Gene expression analysis | **Alexey Sergushichev**
- 13:30 *Lunch*
- 15:00 Gene expression analysis in R | **Alexander Predeus**
- 17:00 *Coffee break*
- 17:15 Getting biological insights from gene expression signatures | **Maxim Artyomov**
- 20:00 *Dinner*
- 21:00 Informal part — introduction into Bioinformatics of Cancer Immunology | **Maxim Artyomov**

18.05

METABOLISM

- 9:00 *Breakfast*
- 9:30 Introduction to metabolism | **Maxim Artyomov**
- 10:30 Metabolic network analysis | **Alexey Sergushichev**
- 11:30 *Coffee break*
- 11:45 Metabolic network analysis continued | **Alexey Sergushichev**
- 12:30 Understanding macrophage activation using transcriptional and metabolic profiling | **Maxim Artyomov**
- 13:30 **Closing**
- 14:00 *Lunch*
- 15:00 **Leaving**

ORGANIZERS



PARTNER

