Workshop in Omics Integration and Systems Biology

19 - 23 April 2021
Online

Rui Benfeitas

NBIS, Stockholm

Nikolay Oskolkov

NBIS, Lund

Ashfaq Ali

NBIS, Lund

Sergiu Netotea

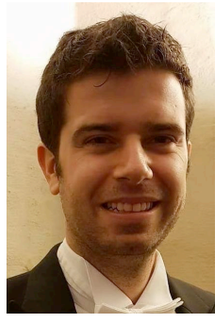
NBIS, Gothenburg

Sebastian Kapell

NBIS, Stockholm

Lokeshwaran Manoharan

NBIS, Lund



Vincent van Hoef

NBIS, Uppsala

Daniel Malmodin

NBIS, Gothenburg

Individual presentations

What is multi-omics integration?

Themes

- **Machine learning methods in integration**
- **Biological network analysis**
- **Genome-scale metabolic modeling**
- **Gene-set centric analysis and reporter features**

Overview: Machine learning in integrative omics

Advantages and pitfalls in integration

Supervised omics integration

Unsupervised omics integration

- Feature projection on latent space
- NMF

Deep Learning

Integration in single-cell

- UMAP and graph abstractions

Overview: Network Analysis

Biological Network topology

- Network inference and Community analysis

Network meta-analysis

Similarity network fusion

Overview: Genome-scale metabolic modeling

Metabolic Modeling

- Simulation with GRN as scaffolds
- Metabolism-driven integration

Metabolism-associated omics analysis

- GSEA from GSMM
- Reporter metabolite analysis

Invited talks

Invited seminars

Dr. Evangelia Petsalaki, EMBL-EBI, UK

"Data-driven approaches towards studying context-specific cell signalling"

Invited seminars

Dr. Jonathan Robinson, BioInnovation Institute, DK

"The evolution of human Genome Scale Metabolic models"

Invited seminars

Dr. Francesco Gatto, Elypta, SE

"Systems biology approaches for translational cancer research"

Invited seminars

Dr. Mihail Anton, NBIS, SE

"The open source ecosystem for genome-scale metabolic models"

Resources

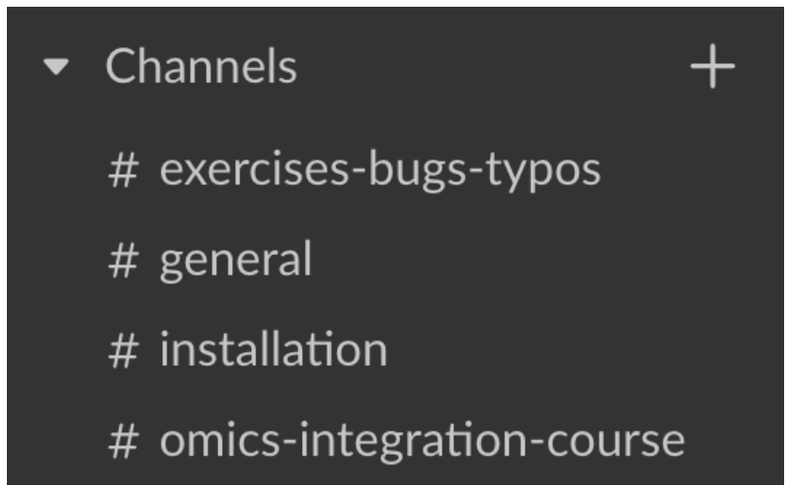
Slides and scripts: Schedule

Specific instructions: HackMD

Workshops: HackMD

Questions / Bugs?: HackMD

slack



General questions

Installation issues

Organization

Lectures

Exercises & Assisted Exercises

Attendance

Feedback (short and long)