



The 7th University of Haifa Winter Workshop in Bioinformatics: Multi-'Omics and Machine Learning

February 14-18, 2021, 08:30-16:30, University of Haifa. 40 hours, 3 academic credit points.

Coordinated by: Daniel Sher (Dept. of Marine Biology, University of Haifa)
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Guest lecturers: TBA

The increasing amount of data produced by “omics” approaches (genomes, transcriptomes, metabolomes, microbiome 16S datasets, etc.) requires specialized statistical analyses. For example, many studies now require the integration of multiple datasets and their combined analysis. In this workshop, we will review some of the leading tools used to integrate and analyze multiple datasets, and practice their application using the programming language R. We will also learn how to appropriately plan experiments generating multi-'omic datasets, and discuss how to present such data appropriately. Some of the key topics we will discuss are:

- How to design a multi-omics project
- Differential analysis (*e.g.*, differential gene expression) and linear models
- Ordination (*e.g.*, PCA), clustering, and hypothesis testing
- Data integration and network analysis
- Machine learning techniques for analyzing 'omics data

The workshop is open to 30 advanced (MSc and PhD) students, postdocs and research scientists from all universities in Israel. Prerequisite courses include genetics, biochemistry, molecular biology, basic statistics and bioinformatics. Students are also expected to be acquainted with R or other programming languages. Participants taking the course for academic credit are **required to register** through the secretariat of their university and to submit a final course project. **The course will be taught remotely in English, with frontal lectures taking place at the University of Haifa if the COVID situation allows.**

Registration is now open - please register online at <https://forms.gle/U7rKxFKfRYGsQPEc9>

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Registration closes January 7th, 2021.