החוג לביולוגיה אבולוציונית וסביבתית
הפקולטה למדעי הטבע
Department of Evolutionary and Environmental Biology
Faculty of Natural Sciences

אוניברסיטת חיפה
University of Haifa
جامعة حيفا

BIOINFO
UHaifa Bioinformatic Service Unit

LEON H. CHARNEY
SCHOOL OF MARINE SCIENCES
בית הספר למדעי הים על שם ליאון צ'רני

The 8th University of Haifa Winter Workshop in Bioinformatics:

BioCyc
Genome Database Collection

DATA SCIENCE RESEARCH CENTER DSRC
UNIVERSITY OF HAIFA

From genomes to metabolism

January 29th-February 2nd, 2023, 08:30-16:30, University of Haifa. 40 hours, 3 academic credit points.

Coordinated by: Daniel Sher (Dept. of Marine Biology, University of Haifa)
Eyal Privman (Dept. of Evolutionary and Environmental Biology, University of Haifa)
Maya Ofek-Lalzar (Bioinformatics Support Unit, University of Haifa)
Peter Karp, Lisa Moore (SRI International)

Guest lecturers: TBD

Understanding how metabolism works in cells, organisms or ecosystems is a highly interdisciplinary and complex task. Metabolic networks first need to be reconstructed, for example through automatic annotation of genome sequences. The resulting draft networks are curated, and can then be interrogated directly or used to interpret experimental evidence, for example transcriptomic, proteomic or metabolomics results. In this workshop, we will teach the fundamentals of genome sequencing and annotation, metabolic reconstruction and metabolic modeling, as well as approaches to analyze experimental results in light of cellular metabolism. The workshop includes 5 days of lectures and hands-on tutorials, using primarily the BioCyc platform (https://biocyc.org/). Some of the key topics we will discuss are:

- How to design a *denovo* genome sequencing, assembly and annotation project
- Metabolic network reconstruction and curation
- Identifying metabolic pathways over-represented in experimental datasets (e.g. transcriptomics)
- Construction and interpretation of genome-scale (constraint-based) metabolic models

The workshop is open to 50 advanced (MSc and PhD) students, postdocs and research scientists from around the world. Prerequisite courses include genetics, biochemistry, molecular biology, basic statistics and bioinformatics. Experience with R or other programming languages is useful but not a prerequisite. 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 workshop will be followed by a ***collaborative metabolic curation workshop for marine bacteria.***

Registration is now open - please register online at https://forms.gle/TJcdPvQoXHUhwV6V7

For more information please contact:

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Eyal Privman: eprivman@univ.haifa.ac.il

Registration closes September 1st, 2022.

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Collaborative metabolic curation workshop for marine bacteria

February 5-8, 2023, University of Haifa.

Marine bacteria are key components of marine ecosystems, and through their metabolism drive global cycles of organic and inorganic matter in the oceans. To understand marine ecosystems therefore one needs to annotate and interrogate the metabolic networks of the organisms inhabiting them. Currently, almost all of the genomes of marine bacteria are annotated automatically and only a handful are curated. This means that there are likely mistakes in gene or pathway annotation that can impact our ability to correctly reconstruct, interpret and model the metabolism of these organisms.

To begin addressing this challenge, the collaborative metabolic curation workshop will bring together students and researchers in order to:

1) ***Discuss key concepts*** in bacterial metabolism, with an emphasis on marine environments
2) ***Learn in-depth metabolic reconstruction*** using the collaborative platform of BioCyc's Pathway Tools.
3) ***Collaboratively curate a metabolic model*** of *Alteromonas*, for use by the entire community.
4) ***Facilitate informal discussions and community building***, during meals and a field trip.

Alteromonas are an abundant clade of marine heterotrophic bacteria with highly versatile metabolism, which are rapidly becoming major models for marine microbiology. During the first two days we will focus on curating *Alteromonas* ATCC 27126 (the type strain for this clade), dividing into teams focusing on a different aspects of metabolism such as biosynthesis, catabolism, transporters etc. We will then extend the model to other *Alteromonas* strains. Depending on the number of participants and their requests we may also add another model organisms.

The workshop is open to 18-24 participants from diverse backgrounds (microbiology, biochemistry, ecology, ocean sciences, bioinformatics, data sciences etc). Limited financial support for travel and/or lodging is available for low income students or researchers.

Registration is now open - please register online at https://forms.gle/TJcdPvQoXHUhwV6V7

For more information please contact Daniel Sher at dsher@univ.haifa.ac.il

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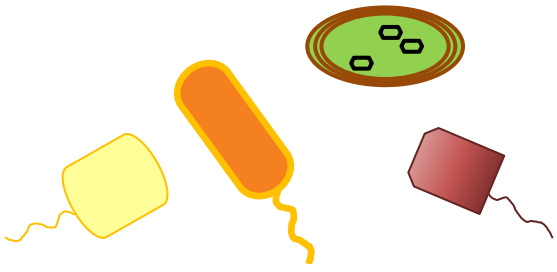

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