



Evolthon: the lab evolution challenge

We are happy to announce first edition of the **Evolthon**. **Evolthon** is a lab evolution challenge for the community of scientists interested in microbial evolution. We are aiming to find new and creative strategies of microorganisms' adaptation toward a given challenge in a lab experimental setting. Evolthon will take place as a part of the "Genome Evolution" meeting at the Weizmann institute of Science on 1st-3rd November 2016. Participants will evolve or engineer microorganisms (*S.cerevisiae* or *E.coli*) toward a specific environmental condition – low temperature. We are interested in exploring with the community how various evolutionary regimes, such as the extent of mutagenesis, population size, existence of sex, severity of stress, status of epigenetic machineries, etc. could affect the trajectory of evolution. We also allow designed engineering of the genome.

We expect a shared publication of all participants in which we will describe the challenge, the strategies and the results.

Experimental setup: strains, Challenges and results evaluation

The challenge would be growth at low temperature (15°C for yeast and 20°C for *E. coli*). To assess the evolved strains' fitness on the challenging condition all competing yeast strains will be pooled together and separately all competing *E. coli* strains will be pooled together and allowed to compete in order to assess the relative fitness of the different strains. The starting strains will be *S. cerevisiae* (strain BY4741), and *E. coli* (strain MG1655). Growth medium in the competition will be YPD for yeast (10g/l yeast extract, 20g/l peptone, 20g/l glucose), and LB for *E. coli* (10g/l tryptone, 5g/l yeast extract, and 10g/l NaCl).

Rules

- 1) Strains: Each participant will receive from the organizers a unique genomic barcoded ancestor from the respective species.
- 2) Mode of competition: All strains from each species will be pooled together and will be grown in batch mode with daily dilution regime at the above temperature and medium for a couple of weeks to allow competition. At the end of this competition period the organizers will deep-sequence the barcodes from the pooled populations to determine the relative fitness of all strains.
- 3) Submission of results: each participant will be required to provide the following:
 - a. The evolved/engineered strains
 - b. A short description of the chosen strategy
 - c. A publication-ready documentation of the evolution/engineering process/protocol
 - d. Growth curves of ancestor and adapted strains on the challenge's conditions
 - e. Whole genome sequencing of the strain (potential and can be submitted at a later stage).

Deadlines

Registration – 15/4/2016

Submission of strains and information – 1/9/2016 (20/8/2016)

Results announcement

Results announcement and discussion will take place at a special session during the Genome Evolution Meeting. Individual participants will be invited to present their strategies.

A joint publication of the challenge

The results will be summarized and submitted as a joint paper authored by all participants. Strategies will have to be documented fully and described as a Material and Methods section. Individual results will not disclose author identity.

Contact

If you are interested to participate please contact Tzachi Pilpel (Pilpel@weizmann.ac.il) AND Ruth Towers (ruth.towers@weizmann.ac.il). Please indicate in which track you are interested – *E. coli* or *S. cerevisiae* and send mailing address for strains shipment.

Adapted strains should be sent to the following address:

Dr. Ruth Towers
Pilpel Lab (Belfer building)
Department of Molecular Genetics
The Weizmann Institute of Science
234 Herzl Street,
Rehovot 7610001
Israel

For further questions please contact Tzachi Pilpel (Pilpel@weizmann.ac.il).