Systems and Synthetic Biology

9th – 13th of July 2012

Instructors:
Pedro Beltrao - Postdoc UCSF, pedrobeltrao@gmail.com - PB
Thomas Lemberger - Chief Editor, Molecular Systems Biology, http://www.nature.com/msb/ - TL
Silvia Santos – Postdoc Stanford University sdsantos@stanford.edu - SS

Course Plan

Monday (PB, SS, TL)
9:00 to 10:00: Introduction to the course
10:00 to 12:00: Introduction to Systems Biology an editor's perspective. (TL)
12:00 to 13:00: Lunch Break
13:00 to 14:00: The world of scientific publishing (TL)
14:00 to 16:00: Introduction to Bioinformatics, Supervised /Unsupervised Machine learning (PB)

Tuesday (PB)
9:00 to 12:00: Introduction to *Omics, Pros/Cons of different high-throughput methods
12:00 to 13:00: Lunch Break
13:00 to 17:00: Practical course 1 - Introduction to Programming part 1

Wednesday (SS, PB)
09:00 to 12:00: Design principles of regulatory signaling networks I: Topology and dynamics (SS)
12:00 to 13:00: Lunch Break
13:00 to 17:00: Practical course 2 - Introduction to Programming part 2 (PB)

Thursday (SS, PB)
09:30 to 12:00: Design principles of regulatory signaling networks II: Spatial dimension (SS)
12:00 to 13:00: Lunch Break
13:00 to 17:00: Practical course 3 – Image analysis (PB, SS)

Friday (PB, SS)
09:30 to 12:00: Synthetic Biology – engineering biological circuits
12:00 to 13:00: Lunch Break
13:00 to 16:00 : Problem set – Writing a paper (SS)
16:00 to 17:00: The academic track, wrap-up and course evaluation (SS,PB)

(Please, bring 1 laptop per two students for the practical courses)

Reading Material

References for the different sub-sections will be given during the week. Please read the following short commentary papers **before** Monday:

1. Can a biologist fix a radio?--Or, what I learned while studying apoptosis. Lazebnik Y. Cancer Cell. 2002 Sep;2(3):179-82.
2. Q&A: Systems biology. James E. F. Jr. Journal of Biology. 2009.
3. The meaning of Systems Biology. Marc Kirschner. Cell 2005