Systems and Synthetic Biology

8th – 12th of July 2013

Instructors:
Pedro Beltrao (PB) – Group Leader, EMBL-EBI, www.ebi.ac.uk/research/beltrao
Euan Adie (EA) – Product Manager, Digital Science http://www.digital-science.com/

Course Plan

Monday (PB)
9:30 to 10:00: Introduction to the course
10:00 to 11:30: Introduction to Systems Biology.
11:30 to 12:00: Description of Grant Proposal exercise for Friday
12:00 to 13:00: Lunch Break
13:00 to 16:00: Bioinformatics, Supervised /Unsupervised Machine learning

Tuesday (PB)
9:30 to 12:00: *Omics, Pros/Cons of different high-throughput methods
12:00 to 13:00: Lunch Break
13:00 to 17:00: Practical course 1 - Programming

Wednesday (PB)
10:00 to 12:00: Design principles of regulatory signaling networks I: Topology and dynamics
12:00 to 13:00: Lunch Break
13:00 to 14:00: Design principles of regulatory signaling networks II: Spatial dimension
14:00 to 17:00: Practical course 2 - Image analysis

Thursday (PB, EA)
9:30 to 10:00: The Academic Track
10:00 to 11:00: Different Scientific careers and intro to Publishing
11:00 to 12:00: The future of Scientific Publishing (Euan Adie)
Free afternoon to prepare the Grant Proposal presentations

Friday (PB)
9:30 to 12:00: Synthetic Biology – engineering biological circuits
12:00 to 13:00: Lunch Break
13:00 to 16:00: Presentations by students – Grant Proposals

(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

Bioinformatics and Image Analysis

- Practical course in Perl programing and Image Analysis

Software to install:

For all (PC and Mac):

Install CellProfiler (http://www.cellprofiler.org/download.shtml)

Install Cluster3.0 (http://bonsai.hgc.jp/~mdehoon/software/cluster/software.htm)

Install TreeView – Mac:TreeView-1.1.6r2-osx.zip; Win:TreeView-1.1.6r2-win.zip

(http://sourceforge.net/projects/jtreeview/files/jtreeview/1.1.6r2/)

On a Windows PC:

Install ActivePerl 5.14 x86 (http://www.activestate.com/activeperl/downloads)

Install Notepad++ (http://notepad-plus-plus.org/)

On a Mac:

Install TextWrangler (http://www.barebones.com/products/TextWrangler/)

On a Linux:

Whatever editor you like.

Additional files (for all):

Create a folder with the name “GABBA”. Go to this address (tinyurl.com/gabba2013) and copy all files to your “GABBA” folder. For now keep the folder in your desktop.