



Introduction to omics and their potential in health and science

Lecturers: Teresa Nogueira and Rita Ponce (Ce3C-FCUL)

Calendar: March 30 - April 4, 2015

Duration: 36 hours

Schedule: 9h-12h and 13h-16h, everyday

Overview: In the recent years we have witnessed the great development of high throughput technologies that has been generating a huge amount of biological data. The omics (genomics, transcriptomics, proteomics, metagenomics, metabolomics, etc....) have been unveiling new genomes, and giving us light on the expression of groups of genes, on the dynamics of the microbial communities, as well as on the interplay between the host cells and organisms and their infectious disease agents, and on the molecular phenotypes of disease. These new technologies have also been used in combination with the aim of understanding the molecular dynamics of infection, genetic diseases, and therapeutic responses. Metagenomics studies can provide us a way to approach the microbial communities, and to understand the interactions between the different members of microbial communities, and the metabolic role of the human microbiome, in the health organism, as well as during infection. This course aims to give a broad view of these technologies and their applications.

General Plan:

1. Genomics
 - a. DNA sequencing technologies
 - b. High throughput sequencing (NextGen Seq)
 - c. Assemblage
 - d. Large scale comparative analysis
2. Epigenomics
 - a. Bisulfite sequencing
 - b. CHIP assays
3. Transcriptomics
 - a. RNA-seq
4. Proteomics and metabolomics
 - a. 2D-PAGE
 - b. Mass spectrometry-based approaches
5. Metagenomics, metatranscriptomics and metaproteomics
 - a. Phylo-typing

- b. Binning
- 6. Pathogenomics
- 7. Multiomic approaches and personalized Medicine
- 8. Analysis of case studies

This course can have recognition of 6 ECTs for FCUL PhD students enrolling in it as part of their first doctoral year. For students only requiring 5 ECTs recognized in their specific PhD programs the last 6 hours of the course are not mandatory and the certificate will be on 'Topics in omics and their potential in health and science'.

Location: Faculdade de Ciências da Universidade de Lisboa

Nº (min, max) students: 10 – 20

Directed to: PhD or MSc students and postdocs working in Biology, Biochemistry and related topics.

Minimal formation of students: bachelor degree in Biology, Biochemistry or related areas.

Fee: free for 1st year PhD students in the Doctoral programme in Biology (FCUL), Biodiversity, Genetics and Evolution (UL; UP) and Biology and Ecology of Global Changes (UL, UA); 20 € for PhD students from institutions of the PEERS network (Ce3C, CFE); 100 € for FCUL Master students and unemployed; 150 € for BTI, BI and other PhD students; 200 € for Professional and postdocs.

Deadline for applications: March 9th, 2015

Candidates should send a short CV and motivation letter to Teresa Nogueira (teresainogueira@gmail.com)