

## **Module 3 / FISABIO Summer School in Biomedical Research and Public Health: Basic Computational Skills for Genomic Analysis**

**Dates: July 9<sup>th</sup> - July 13<sup>th</sup> 2018**

**Coordinator: Giuseppe D'Auria ([dauria\\_giu@gva.es](mailto:dauria_giu@gva.es))**

The course is addressed to students and professionals of biology, biomedical research, the health sciences and related fields who are interested in learning the basic computational skills required to pursue their own genomic analyses. The module will be eminently practical and hands-on, and will teach participants skills ranging from the installation and basic use of Linux systems to the building of analysis pipelines and the utilization of the main functions available in the "R" platform for statistical analysis of genomes and metagenomes. Theoretical lectures and practical hands-on sessions will be taught by FISABIO researchers and informaticians.

Official language: English.

### **Instructors:**

**Alejandro Artacho.** MS in Bioinformatics, FISABIO-SP, Bioinformatician at Genomics and Health Area.

**Pascual Asensi.** Systems Administrator, University of Valencia, Genomics and Health Area.

**Giuseppe D'Auria.** PhD., FISABIO-SP, Coordinator of Sequencing and Bioinformatics Service.

**Rosario Gil.** Associate professor, University of Valencia.

**David Perez-Villarroya.** MS. in Bioinformatics, FISABIO-SP, Bioinformatics technician at Sequencing and Bioinformatics Service.

### **Course program:**

#### **Monday July 9<sup>th</sup>:**

09:15 – 10:00 Next generation sequencing technologies: the birth of the Genomics Era

*Rosario Gil*

10:00 – 10:45 Comparative genomics for genome annotation and functional analysis.

*Rosario Gil*

#### **Break**

11:00 – 11:45 NGS in microbial ecology (Taxonomy and metagenomics).

*Rosario Gil*

11:45 – 13:00 Linux system, installing a new distro I.

*Pascual Asensi*

#### **Lunch**

14:30 – 16:00 Linux system, installing a new distro II.

*Pascual Asensi*

16:00 – 16:30 From office automation to computation for NGS.

*Giuseppe D'Auria*

16:30 – 17:30 Unix commands, moving around the system, practice I.

*David Perez-Villarroya*

## **Tuesday July 10<sup>th</sup>:**

09:00 – 10:45 Unix commands, moving around the system, practice II.  
*David Perez-Villarroya*

### **Break**

11:00 – 12:00 One command line pipelines, practice.  
*Giuseppe D'Auria*

12.00 – 13.00 NGS Bioinformatics formats, managing data.  
*Giuseppe D'Auria*

### **Lunch**

14.30 – 15.30 NGS Bioinformatics formats, managing data, practice.  
*Giuseppe D'Auria*

15:30 – 16:30 Genome Assembly and mapping.  
*Giuseppe D'Auria*

16:30 – 17:30 Genome assembly, practice.  
*Giuseppe D'Auria*

## **Wednesday July 11<sup>th</sup>:**

09:00 – 10:45 Genome mapping, practice.  
*Giuseppe D'Auria*

### **Break**

11:00 – 12:00 Introduction to “R”. How to install the environment, applications.  
*Alejandro Artacho*

12:00 – 13:00 R data formats and operations, practice I.  
*Alejandro Artacho*

### **Lunch**

14:30 – 16:30 R data formats and operations, practice II.  
*Alejandro Artacho*

14:30 – 17:30 R programming for bioinformatics.  
*Alejandro Artacho*

## **Thursday July 12<sup>th</sup>:**

09:00 – 10:45 R programming for bioinformatics, practice I.  
*Alejandro Artacho*

### **Break**

11:00 – 13:00 R programming for bioinformatics, practice II.  
*Alejandro Artacho*

### **Lunch**

14:30 – 16:00 R practice and tutoring.  
*Alejandro Artacho*

16:00 – 17:30 R practice and tutoring.  
*David Perez-Villarroya*

## **Friday July 13<sup>th</sup>:**

09:00 – 10:45 Students Projects.  
*Giuseppe D'Auria*

### **Break**

11:00 – 12:00 Tests and questionnaires.  
*Giuseppe D'Auria*

12:00 – 13:00 NGS sequencing and beyond  
*Rosario Gil*