



GENERALITAT  
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## FISABIO SUMMER SCHOOL 2026

### Module IV – Microbial Genomics and Metagenomics Workshop

**Dates:** July 20th – July 24th 2026

The workshop is addressed to students and professionals of biology, biomedical research, the health sciences and related fields who are interested in learning and sharing concepts, tools and research results in genomics, metagenomics and the human microbiome. The workshop will train participants in state-of-the-art analytical methods in this area, by means of theoretical lectures and seminars as well as practical hands-on sessions in bioinformatics and biostatistics. Several sessions will be devoted to training in the use of the Integrated Microbial Genomes system (IMG), a database and analysis platform developed at the U.S. DOE Joint Genome Institute (Berkeley, California) for comprehensive studies of genomes and metagenomes. The IMG system will be presented by Dr. Natalia Ivanova and Dr. Rheka Seshadri from the JGI's Microbial Genomics & Metagenomics Scientific Program, the group responsible for IMG development. In addition, Dr. Vanessa R. Marcelino (Institute of Agrochemistry and Food Technology IATA-CSIC) and Dr. Kshitij Tandon (University of Melbourne) will introduce concepts and methodologies of metabolic reconstruction for single genomes and bacterial communities..

#### Instructors:

- **Giuseppe D'Auria**, PhD. Scientist, FISABIO-PUBLIC HEALTH, Genomics and Health Area and CIBERESP. Coordinator of FISABIO Sequencing and Bioinformatics Service
- **M. Pilar Francino**, PhD. Scientist, FISABIO-PUBLIC HEALTH, Genomics and Health Area and CIBERESP
- **Natalia Ivanova**, PhD. Scientist, JGI, Microbial Genomics & Metagenomics Scientific Program
- **David Páez**, PhD. Associate Director of Discovery Informatics at Mammoth Biosciences
- **Mariana Reyes**, PhD. Scientist, FISABIO- PUBLIC HEALTH, Bioinformatician at the Sequencing and Bioinformatics Service
- **Vanessa Rossetto Marcelino**, PhD. Scientist, Institute of Agrochemistry and Food Technology (IATA-CSIC)
- **Rekha Seshadri**, PhD. Scientist, JGI, Microbial Genomics & Metagenomics Scientific Program
- **Kshitij Tandon**, PhD. Postdoctoral Researcher, University of Melbourne.

#### Module program:

##### Monday July 20<sup>th</sup>:

FUNDACIÓ PER AL FOMENT DE LA INVESTIGACIÓ SANITÀRIA I BIOMÈDICA DE LA COMUNITAT VALENCIANA (FISABIO). C/ Misser Mascó nº 31. 46010 València. CIF.: G98073760 Inscrita Registre fundacions: 501 V - [www.fisabio.san.qva.es](http://www.fisabio.san.qva.es)

- 09:00 - 10:00 Welcome and Overview of the Workshop by Dr. M. Pilar Francino, Dr. Rekha Seshadri and Dr. Natalia Ivanova.

- 10:00 - 11:00 Features and Diversity of Microbial Genomes by Dr. M. Pilar Francino.

**Break**

- 11:15 - 13:15 Microbial Communities, the Human Microbiome and its Relationship to Health by Dr. M. Pilar Francino.

**Lunch**

- 15:00 - 16:30 Introduction to the Analysis of Bacterial Communities by Dr. M. Pilar Francino.

- 16:30 - 18:00 DNA Sequencing: History and Recent Technologies by Dr. Giuseppe D'Auria.

**Tuesday July 21<sup>st</sup>:**

- 09:00 - 11:00 Informatic Processing, Quality Control, and Assembly of Sequencing Reads by Dr. Mariana Reyes.

**Break**

- 11:15 - 12:15 Introduction to the Integrated Microbial Genomics system by Dr. Natalia Ivanova.

- 12:15 - 13:15 Introduction to Functional Annotation and Comparative Genomics in IMG by Dr. Rekha Seshadri

**Lunch**

- 15:00 - 16:00 Isolate Comparative Genomics Case Study: Live Demo by Dr. Rekha Seshadri

- 16:00 - 18:00 Hands-on Exercise, Review and Discussion of Solutions (student work and supervision by Dr. Rekha Seshadri and Dr. M. Pilar Francino).

**Wednesday July 22<sup>nd</sup>:**

- 09:00 - 10:00 Introduction to IMG/M Metagenome Analysis by Dr. Natalia Ivanova

- 10:00 - 11:00 Metagenome Comparisons Case Study: Live Demo by Dr. Natalia Ivanova.

**Break**

- 11:15 - 13:15 Hands-on Exercise, Review and Discussion of Solutions (student work and supervision by Dr. Natalia Ivanova and Dr. M. Pilar Francino).

**Lunch**

- 15:00 - 18:00 CRISPR Analyses and Uncovering the Earth's Virome by Dr. David Páez-Espino.

**Thursday July 23<sup>rd</sup>:**

- 09:00 - 11:00 Introduction to metabolic models of microbial communities by Dr. Vanessa R. Marcelino and Dr Kshitij Tandon

1) Introduction.

2) Genome-scale Metabolic Modeling: Live Demo.

**Break**

- 11:15 - 13:15 3) Expanding Genome-scale Metabolic Modeling to Bacterial Communities: Hands-on Exercise.

**Lunch**



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- 15:00 - 18:00 Preparation of student analysis projects: students form groups, choose their genome or metagenome analysis project and start carrying it out (student work and supervision by Dr. Rekha Seshadri, Dr. Natalia Ivanova and Dr. M. Pilar Francino).

**Friday July 24<sup>th</sup>:**

- 09:00 - 11:00 Preparation of student analysis projects: students complete their genome or metagenome analysis project and prepare a presentation (student work and supervision by Dr. Rekha Seshadri, Dr. Natalia Ivanova and Dr. M. Pilar Francino).

**Break**

- 11:15 - 12:45 Presentations of genome or metagenome analysis projects by student groups (student work and supervision by Dr. Rekha Seshadri, Dr. Natalia Ivanova and Dr. M. Pilar Francino).

- 12:45 - 13:15 Workshop Summary and Discussion by Dr. M. Pilar Francino

**Location:** Library - Fisabio-Salud Pública. Av. Catalunya, 21. 46020 Valencia

**Module price:** 350€/persona