

Bacterial Genetic: from Evolution to Engineering

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The goal of the module is to give a broad view of the field of microbial genetics today, through talks of scientists working on diverse subjects. The idea is to focus on novel and recent themes of the field. Days are organized to get the big picture through an introductory class summarizing the main concepts on a specific topic and then dive into recent work through researchers presenting in depth their work. The main themes include phages, evolution, synthetic biology, single cell heterogeneity and ancient DNA. Researchers both from academia and the private sector will give seminars, allowing students to also discover research outside the academic world. Students will be evaluated on providing a written synthesis of the week (similar to what could be asked by a PI after a student attends a conference) that will be written on the last afternoon.

Lundi : Phages and anti-phage systems

9h30-12h30 **Nicolas Rascovan**, Pasteur Institute

Ancient microbial genomics as a new perspective to microbial research

13h30-15h **David Bikard**, Pasteur Institute

CRISPR: From a bacterial immune system to genome editing technologies

15h30-17h **Anne Chevallereau**, Institut Cochin

Coevolution between phages and bacteria: the case of CRISPR-Cas systems and anti-CRISPR proteins

Mardi : Evolution

9h00-12h00 **Antoine Frenoy** TIMC-Grenoble

Population Genetics and Molecular Evolution

13h30-15h00 **Olaya Rendueles-Garcia** Pasteur Institute

15h15-17h **Jean Cury**

Mercredi : Synthetic biology

9h00-12h00 **Arnaud Gutierrez** Cochin Institute

bacterial synthetic gene circuits and their applications

13h30-15h30 **Helena Shomar - Vincent Libis**

New Molecule discovery

16h-17h30 **Etienne Ruppé** IAME-Bichat

Novel aspects on antibiotic resistance

Jedi : From population to single cell

9h30-12h30 **Benoît Chassaing** Cochin Institute

Microbiote evolution

13h30-15h **Giulia Manina** Pasteur Institute

Phenotypic variation: A promising target against mycobacteria

15h30-17h **Bianca Sclavi**

Single cell dynamics of gene expression in response to environmental changes and sublethal levels of antibiotics.

Vendredi

9h00h-10h30 **Aude Bernheim**, CRI Paris

Phages, the viruses of bacteria and how bacteria fight back

11h-12h30 **Laura Gomez-Valero**, Pasteur Institute

Role of horizontal gene transfer in bacterial genome evolution

14h-17h Test