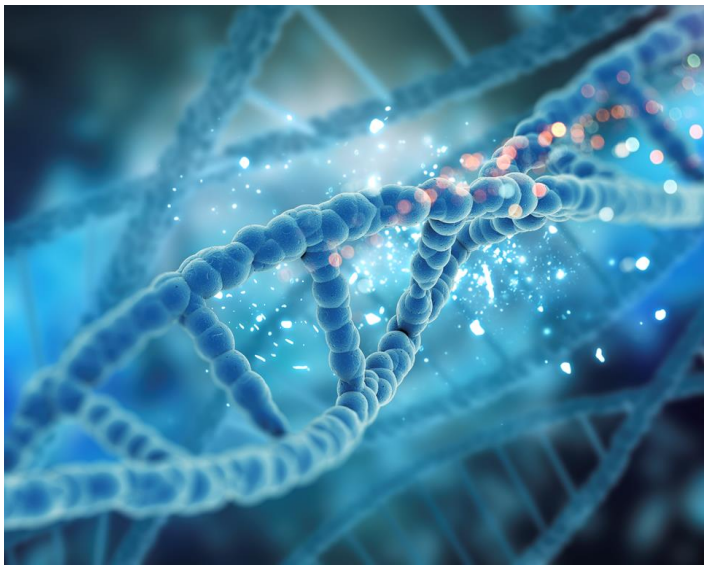
Institut Pasteur

Pasteur course

HUMAN POPULATION GENOMICS AND GENETIC EPIDEMIOLOGY



PROGRAM

2018-2019

PASTEUR COURSE

HUMAN POPULATION GENOMICS AND GENETIC EPIDEMIOLOGY

October 8-19, 2018

This two-week course presents theoretical lectures, research examples and hands-on computer training on concepts and tools used in the study of human population genomics and genetic epidemiology.

The first week consists in three days of both theoretical lectures and research examples, and two days of hands-on-computer training and discussions presenting the concepts and the technical tools used in both human population genomics and genetic epidemiology.

The second week consists in detailed theoretical bases in population genomics and genetic epidemiology analyses and practical computer-based training in the most recent concepts and analyses used in both disciplines.

The practical training (computer laboratory work and discussion of the results) is based on real-data examples, using as a paradigm infectious diseases.

Candidates must have basic knowledge in molecular genetics, statistics and informatics

Co-directors

Lluis QUINTANA-MURCI
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Honorary director

Mr ABEL Laurent
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HUMAN POPULATION GENOMICS AND GENETIC EPIDEMIOLOGY
2018-2019

FIRST WEEK

MONDAY, OCTOBER 8 — HUMAN GENOME DIVERSITY

9:00-10:30	Welcome	**Register office**
	General Introduction	**Alexandre ALCAIS** (Institut IMAGINE, INSERM-Univ. Paris-Descartes) and **Lluis QUINTANA-MURCI** (Institut Pasteur, Paris)
10:45-12:15	Human genome diversity and public databases	**Lluis QUINTANA-MURCI** (Institut Pasteur)
13:30-15:15	A survival kit to Genetic Epidemiology	**Alexandre ALCAIS** (Institut IMAGINE, INSERM-Univ. Paris-Descartes)
15:30-17:00	A survival kit to bioinformatics	**Guillaume LAVAL** (Institut Pasteur)

TUESDAY, OCTOBER 9 — GENOTYPE-BASED ANALYSES: LINKAGE ANALYSIS

9:00-10:30	Research in Genetic Epidemiology: Why, When, Who, How	**Alexandre ALCAIS** (Institut IMAGINE, INSERM-Univ. Paris-Descartes)
10:45-12:15	Research in genetic epidemiology: WWWHOW part II	**Alexandre ALCAIS** (Institut IMAGINE, INSERM-Univ. Paris-Descartes)
13:30-15:00	Linkage analyses: principles and methods	**Sophie GARNIER** (Sorbonne Université, Paris)
15:30-17:00	Linkage analyses: hands-on computer	**Sophie GARNIER** (Sorbonne Université, Paris)

WEDNESDAY, OCTOBER 10 — GENOTYPE-BASED ANALYSES: ASSOCIATION STUDIES

9:00-10:30	Linkage disequilibrium: principles and methods	**Etienne PATIN** (Institut Pasteur)
10:45-12:15	Linkage disequilibrium: hands-on computer	**Jeremy MANRY** (Institut IMAGINE, INSERM-Univ. Paris-Descartes)
13:30-15:00	Association studies: principles and methods	**Sophie GARNIER** (Sorbonne Université, Paris)
15:30-17:00	Association studies: hands-on computer	**Sophie GARNIER** (Sorbonne Université, Paris)

THURSDAY, OCTOBER 11 — GENOTYPE-BASED ANALYSES: ASSOCIATION STUDIES II

9:00-10:30	Genome-wide association studies: principles and methods	**Etienne PATIN** (Institut Pasteur)
10:45-12:15	Genome-wide association studies: hands-on computer	**Alexandre ALCAIS and Jeremy MANRY** (Institut IMAGINE, INSERM-Univ. Paris-Descartes)
13:30-15:00	Genome-wide association studies: hands-on computer II	**Alexandre ALCAIS and Jeremy MANRY** (Institut IMAGINE, INSERM-Univ. Paris-Descartes)
15:30-17:00	Genome-wide association studies: hands-on computer III	**Alexandre ALCAIS and Jeremy MANRY** (Institut IMAGINE, INSERM-Univ. Paris-Descartes)

FRIDAY, OCTOBER 12 — SEQUENCE-BASED ANALYSIS: WHOLE EXOME/GENOME STUDIES

9:00-10:30	A survival kit to Whole exome/genome sequencing	**Aurélie COBAT** (Institut IMAGINE, INSERM-Univ. Paris-Descartes)
10:45-12:15	Whole-exome studies: hands-on computer	**Aurelie COBAT and Yoann Seeleuthner** (Institut IMAGINE, INSERM-Univ. Paris-Descartes)
13:30-15:00	Whole-exome studies: hands-on computer II	**Aurelie COBAT and Yoann Seeleuthner** (Institut IMAGINE, INSERM-Univ. Paris-Descartes)
15:30-17:00	Whole-exome studies: hands-on computer III	**Aurelie COBAT and Yoann Seeleuthner** (Institut IMAGINE, INSERM-Univ. Paris-Descartes)

HUMAN POPULATION GENOMICS AND GENETIC EPIDEMIOLOGY
2018-2019

SECOND WEEK

MONDAY, OCTOBER 15 — POPULATION GENETICS, EVOLUTION AND HUMAN DEMOGRAPHY

9:00-9:30	Population genetics, evolution and demography: an overview	**Lluis QUINTANA-MURCI** (Institut Pasteur)
9:45-12:15	Principles in population genetics	**Paul VERDU** (MNHN, Paris,)
13:30-15:00	Population structure and human demography I	**Guillaume LAVAL** (Institut Pasteur)
15:30-17:00	Population structure and human demography II	**Guillaume LAVAL** (Institut Pasteur)

TUESDAY, OCTOBER 16 — NATURAL SELECTION AND GENETIC ADAPTATION

9:00-10:00	Research examples of natural selection: why and how	**Lluis QUINTANA-MURCI** (Institut Pasteur)
10:15-12:15	Natural selection: principles and methods	**Etienne PATIN** (Institut Pasteur)
13:30-17:00	Natural selection: hands-on computer	**Etienne PATIN** (Institut Pasteur) and **Jeremy MANRY** (Institut IMAGINE, INSERM-Univ. Paris-Descartes)

WEDNESDAY, OCTOBER 17 — GENOME-WIDE SCANS FOR SELECTION (GSS)

9:00-10:30	Basics in genome-wide statistics for selection detection	**Guillaume LAVAL** (Institut Pasteur)
10:45-12:15	Genome-wide scans for selection: principles and hands-on computer I	**Guillaume LAVAL** and **Etienne PATIN** (Institut Pasteur)
13:30-15:45	Genome-wide scans for selection: principles and hands-on computer I	**Guillaume LAVAL** and **Etienne PATIN** (Institut Pasteur)
16:00-17:00	A genome-wide view of demography and selection in African populations: research example	**Etienne PATIN** (Institut Pasteur)

THURSDAY, OCTOBER 18 — THE GENETICS OF GENE EXPRESSION AND BEYOND

9:00-10:30	Genetics of gene expression: principles, methods and eQTLs	**Maxime ROTIVAL** (Institut Pasteur)
10:45-12:15	Genetics of gene expression: hand-on computer I	**Maxime ROTIVAL** and **Lucas HUSQUIN** (Institut Pasteur)
13:30-15:45	Genetics of gene expression: hand-on computer II	**Maxime ROTIVAL** and **Lucas HUSQUIN** (Institut Pasteur)
16:00-17:00	Gene expression, immune response and adaptation in humans: research example	**Hélène QUACH** (Institut Pasteur)

FRIDAY, OCTOBER 19 — KEYNOTE LECTURES

Both lectures will take place at amphitheatre François Jacob (grand floor)

10:00-11:00	Ancient genomics and African population history	**Pontus SKOGLUND** (The Francis Crick Institute, London)
11:00-12:00	Local regulatory networks across two cell types	**Olivier DELANEAU** (University of Geneva)
14:30-17:30	Written examination *(Room 4 of the Teaching Centre)* Duration 3 hours - Grade out of 20	

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ADDRESS DETAILS

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