



Genetics  
Genomics  
Epigenetics  
Evolution

## Master2 GenE<sup>2</sup> – Master Biology-Health – Paris-Saclay University

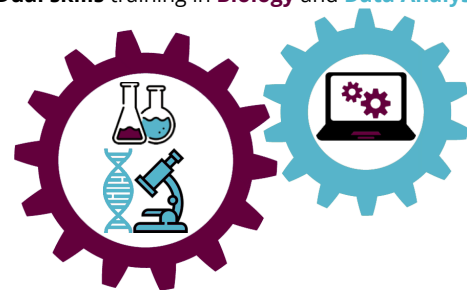
The international Master's 2 GenE2 is aimed at students in Biology, Medicine, Pharmacy, or any other relevant scientific curriculum, who wish to acquire skills in the manipulation, processing and statistical analysis of high-throughput sequencing data. This course is suitable for students interested in the concepts and technologies of genetics, genomics, epigenetics and epigenomics integrating structural, functional and evolutionary aspects.

The originality of this M2 is to integrate the recently developed technologies by combining them with a solid training in processing and analysis of high-throughput data including two practical workshops: ChIP-seq and Big Data.

### The strengths and originality of the Master2 GenE<sup>2</sup>

- A **"ChIP-seq" workshop**: A to Z realization of a chromatin immunoprecipitation experiment followed by Illumina sequencing
- A **"Big Data" workshop**: a practical workshop for the analysis of NGS data, aimed at familiarizing students with the manipulation and exploitation of highthroughput sequencing data from genomics, epigenomics and transcriptomics. ...
- Teaching units in the form of **lectures in English** given by specialists in each field
- An **internship of 6 months** in a research team or in a company
- A **network of host laboratories** in Ile-de-France, in France and abroad

Dual skills training in **Biology** and **Data Analysis**



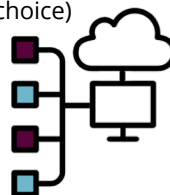
### GenE<sup>2</sup> teaching units



- **ChIP-seq** and **Big Data** workshops (100 h / 12 ECTS)
- non-coding RNAs and **epigenetics** (25 h / 3 ECTS)
- Functional **Genomics** (25 h / 3 ECTS)
- Stability and Evolution of **Genomes** (25 h / 3 ECTS)
- **Genome**, Phenotype and Populations (25 h / 3 ECTS)
- Two optional Teaching Units (50 h / 6 ECTS – Open choice)
- M2 Internship (6 months / 30 ECTS)



**'ChIP-seq' workshop**  
Perform a chromatin immunoprecipitation experiment followed by Illumina sequencing



**'Big Data' workshop**  
Analyze sequencing data and manipulate genomics, epigenomics and transcriptomics datasets

### The GenE<sup>2</sup> internship

- Genetics
- Genomics
- Epigenetics
- Epigenomics
- 3D genome organization
- Human genetics
- Genetics diseases
- Cancers
- Data analysis
- Development
- Evolution
- ...



### The GenE<sup>2</sup> supervisors

- Sébastien Bloyer
- Pierre Capy
- Cécile Fairhead

**Secretary:** Nathalie Beauvois

Contact UVSQ: Frédéric Crémazy

### The GenE<sup>2</sup> partnerships

### Contact


[www.gene2.fr](http://www.gene2.fr)

[contact@gene2.fr](mailto:contact@gene2.fr)



MASTER

**Biologie-Santé**  
**Life Sciences and Health**



Genetics  
Genomics  
Epigenetics  
Evolution  
**GenE2**

**Dedicated to biology students** who wish to acquire skills in data analysis of sequencing data

- [sebastien.bloyer@universite-paris-saclay.fr](mailto:sebastien.bloyer@universite-paris-saclay.fr)
- [cecile.fairhead@universite-paris-saclay.fr](mailto:cecile.fairhead@universite-paris-saclay.fr)
- [pierre.capy@universite-paris-saclay.fr](mailto:pierre.capy@universite-paris-saclay.fr)



# Master 2 GenE<sup>2</sup>

**Dual skills** training in **Biology** and **Data Analysis**

All information on our website:

[www.gene2.fr](http://www.gene2.fr)



# GenE<sup>2</sup> Teaching units :

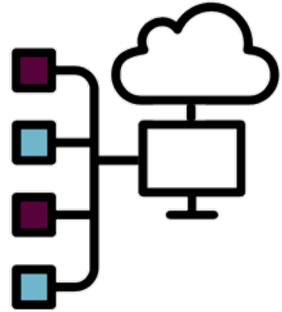
*Lectures and conferences in English*

- ChIP-seq and Big Data Practical Course (100 h / 12 ECTS)
- non-coding RNAs and epigenetics (25 h / 3 ECTS)
- Functional Genomics (25 h / 3 ECTS)
- Stability and Evolution of Genomes (25 h / 3 ECTS)
- Genome, Phenotype and Populations (25 h / 3 ECTS)
- Two optional Teaching Units (50 h / 6 ECTS – Open choice)
  
- M2 Internship (6 months / 30 ECTS)



## 'ChIP-seq' workshop

Perform a chromatin immunoprecipitation experiment followed by Illumina sequencing



## 'Big Data' workshop

Analyze sequencing data and manipulate genomics, epigenomics and transcriptomics datasets

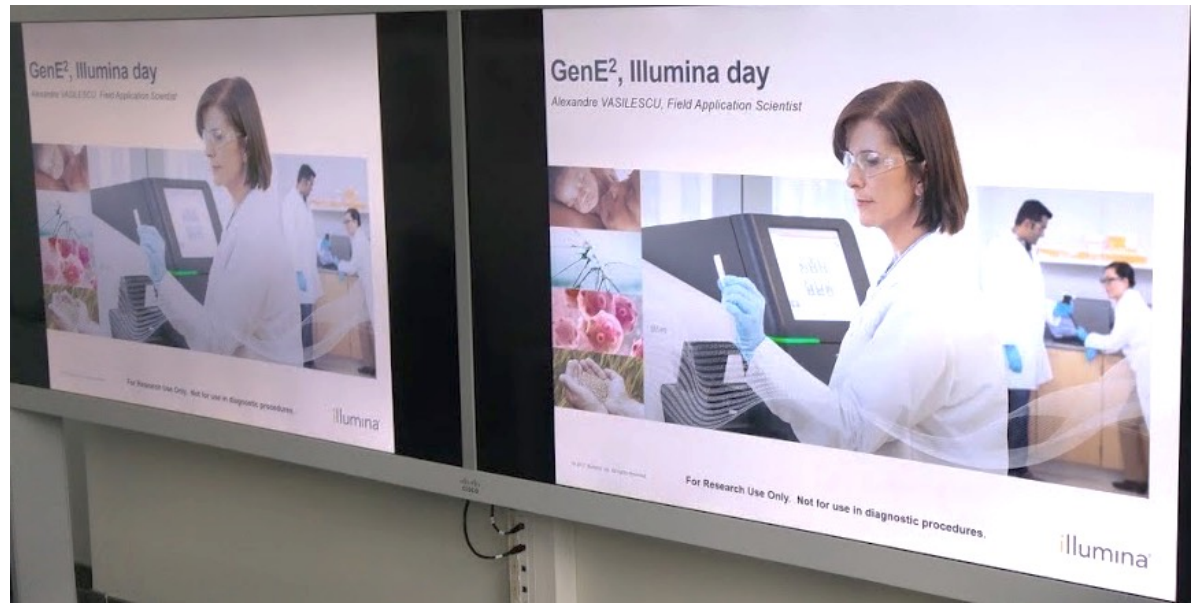
In collaboration with **Illumina**





# One Day @ the Illumina Solution Center Paris

- Illumina laboratory tour,
- presentation of the sequencing technologies,
- careers at Illumina





# One Day @ the Illumina Solution Center Paris

- Sequencing library preparation
- Launch a run on NextSeq 550







# One Day @ the GENOSCOPE

- *'Centre National de séquençage'* located at Evry
- Meet the GENOSCOPE researchers
- Conferences about GENOSCOPE activities
- Metagenomics & TARA OCEANS
- Genomic data analysis and storage
- Visit of the sequencing platform







A **6 months internship** in **wet lab**,  
in **data analysis**, or **both**

You **choose the theme you like !**



- Genetics
- Genomics
- Epigenetics
- Epigenomics
- 3D genome organization
- Human genetics
- Genetics diseases
- Cancers
- Data analysis
- Development
- Evolution
- Modelisation
- ...





In France or abroad





## Career opportunities and professional integration



**Dual skill** highly sought after by academics, R&D and companies

### The PhD

After obtaining the Master's degree, graduates can pursue by a thesis by applying to a PhD contract from a doctoral school (Paris-Saclay or external), or from a 'PhD Track' program in France or abroad.

Some labs or private companies can also fund a PhD on their own grants (SIFRE, ANR, ERC, FRM, ...)

### Main markets

Basic or applied research in the academic sector (Paris-Saclay, ENS, Institut Pasteur, Institut Curie, Institut Jacques Monod, Génopole, ...) or R&D in a private company, in France or abroad.

Engineer, research engineer, analyst, ...

### Areas of research

Bioinformatics, data analysis, oncology, gene therapy, biotechnology, ecology, environment, genetic counseling, teaching, scientific watch, scientific communication, valorization, ...



[contact@gene2.fr](mailto:contact@gene2.fr)



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GenE2 managers:

[sebastien.bloyer@universite-paris-saclay.fr](mailto:sebastien.bloyer@universite-paris-saclay.fr)

[cecile.fairhead@universite-paris-saclay.fr](mailto:cecile.fairhead@universite-paris-saclay.fr)

[pierre.capy@universite-paris-saclay.fr](mailto:pierre.capy@universite-paris-saclay.fr)

ChIP-seq workshop :

[benoit.moindrot@universite-paris-saclay.fr](mailto:benoit.moindrot@universite-paris-saclay.fr)

[pierre.grognet@universite-paris-saclay.fr](mailto:pierre.grognet@universite-paris-saclay.fr)

GenE2 Secretary:

[nathalie.beauvois@universite-paris-saclay.fr](mailto:nathalie.beauvois@universite-paris-saclay.fr)

BigData workshop :

[gaelle.lelandais@universite-paris-saclay.fr](mailto:gaelle.lelandais@universite-paris-saclay.fr)

[elodie.marchadier@universite-paris-saclay.fr](mailto:elodie.marchadier@universite-paris-saclay.fr)