

## **Master Specialty Biotherapies: Tissue, cell and gene**

Applications must be filled online between Mars and June  
Tutorial in English will be available this site being exclusively in French.

**Diploma:** Master degree (MSc)  
**Study duration:** one year

### **Contacts**

Educational manager: Mario  
OLLERO

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address: Master biotherapies – Bureau 107 - Faculté de Médecine de Créteil - 8 rue du  
Général Sarrail, 94010 Créteil cedex, France

Place of teaching.

Courses and lectures: Faculty of Health of Créteil;  
Paris-Saclay University (Evry campus),; Internship:  
in host laboratories.

### **Goals**

The goals of this major are the acquisition of competencies applicable to the field of biotherapies, including gene therapies (gene transfer, intervention on genes), cell therapies (manipulation of stem cells or differentiated cells), immunotherapy, innovative pharmaceutical therapies, use of biomaterials, etc. Their implementation is based on upstream basic science, in a context of very wide ranging basic biology, and on development and transfer of biomedical research towards the realm of biotechnology and the pharmaceutical industry.

The syllabus of this program takes into account the most recent concepts, innovations and applications in the field of biotherapies. The best specialists on each area in France give the lectures.

### **Targeted competencies**

**Objectives:** the first objective is to provide the students with solid foundations with regards to biological research in the field of biotherapies. The course contents allow scientists to get familiar with an integrated approach of biology and physiopathology, and doctors, pharmacologists and veterinarians to familiarize with experimental research.

### **Competencies targeted by the programme:**

- analysis and critical review of scientific results
- exposure to scientific literature
- analysis of potential applications of scientific results in terms of development

**Further studies after the Master programme:** PhD Thesis.

**Opportunities:** biotechnology industries, research and development in industry, university research, and communication of scientific matter. Popularization of science, medicine, pharmaceuticals, veterinary medicine.

## MASTER year 2 (M2)

All lectures are offered in English - English-speaking people are welcome

**Recruitment level:** Bachelor degree plus 1 year, or graduate level or equivalent .

Admission in M2 is subjected to a selection by the M2 jury

Foreign Degrees: the academic level must be equivalent to the M1 level (at least 4 years of undergraduate studies). In case of uncertainty, contact the educational manager of the master program by email. Information on academic levels is available in Campus France branches ([www.campusfrance.org](http://www.campusfrance.org)).

Applicants' selection: Required contents of the application file are explained below. The deadline to load application files is set on 16<sup>th</sup> June of the academic year. The interview of admissible candidates by the M2 jury will take place on beginning of July, at the Health school of the University of Creteil or by telephone or Zoom/Teams session for students living outside France. Place of internship (research laboratory). Applicants will have to find their own host laboratory for their internship. It can be located either in France or abroad. The head of the master programme will give advice upon request. The internship project must be validated by the academic committee.

- [The applicant may either look in the list provided by the Master programme](#)
- The applicant may prefer to do his or her internship in another research organization. In this case, it is advisable for the applicant or for the host laboratory to contact the master educational manager directly by email or by phone.

### Year schedule

- All lectures of the "Parcours Recherche" are given in English. Lecture supports are available in English.
- Exams are offered both in English and in French (written exam, essay and oral defense of the internship report).
- Theory: 7 to 8 compulsory UE (courses and lectures from November to December )
- Practice internship of 6 months in a laboratory validated by the master's academic committee (January-June).

### Teaching programme

#### UE - Tools for biotherapies

I- Vectorology (adenovirus, AAV, retrovirus, non viral vectors...); II- Stem cells (concepts, embryonic stem cells, haematopoietic, mesenchymal stem cells, in vitro expansion, adult stem cells...); III- Other tools (antisens, siRNA, artificial matrix)

#### UE - Animal models

I- General points (transgenic animals: use, techniques...); II- Preclinical models (neuromuscular diseases, hereditary myopathies, diabetes, myocardium ischemia, neurodegenerative disease...)

#### UE - Antineoplastic strategies

Cytokines and immunotherapy, anti-tumoral vaccination, cell therapy of anti-tumoral immunity, lymphoma Immunotherapy, anti-angiogenic strategies...

#### UE - Immunotherapies of immune diseases

Cytokines and treatment of HIV infection, biotherapies of joint inflammatory diseases, immunotherapies of neurological diseases, regulatory T lymphocytes...

#### UE - New therapies of genetic diseases

Epidermolysis bullosa, cystic fibrosis, retinal diseases, B haemophilia, Friedreich ataxia, muscular dystrophies, neurocristopathies...

#### UE - Regenerative Medicine

Therapies of: skeletal muscle diseases, liver diseases, neurodegenerative diseases, cartilage, cardiac failure, wound repair, endovascular therapies...

#### UE - Transfusion and biotherapies

Stem cells: a source of blood cells for transfusion, in vitro expansion of haematological stem cells, gene therapy of hemoglobin disorders...

#### UE - Scientific watch and communication

Students are invited to present the analysis of a paper in their research field.

#### UE - Project presentation

Students are invited to present their research program.

## Required contents of the application file

- CV form (to download from the E-CAMPUS webpage) is to fill. Please carefully fill each item with a text processor (winword...) not with hand. Please provide also the program of graduation (or equivalent) so that the jury may evaluate the degree course and applicant's competences.
- An application letter, that should present the reasons for applying to the master, and the applicant's wishes and goals in terms of thesis (PhD) or/and career.
- A proof of previous research experience in a laboratory. In general a two-month internship or equivalent is required.
- Any other document that may be useful for the jury, such as internship notations or comments, teacher's references... Internship notifications from lab supervisors are very welcome
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