

Master Ingénierie de la santé – Parcours : Molecular and Cellular biotherapy (MCB)

SCIENCES, TECHNOLOGIES, SANTÉ

Présentation

The BME-Paris Master is designed to provide a 2-year education program in the field of bioengineering, at the cross-road of biomedical and engineering sciences. It results from a partnership between Université Paris Descartes, Arts-et-Métiers ParisTech and Université PSL.

Based on this unique partnership, this Master is founded on an educational policy that favors interdisciplinarity and students' initiative as well as international perspective. This policy is supported by the top-level and complementary expertise and know-how of the three partners: engineering sciences in the three engineering schools within PSL (ESPCI Paris, Mines ParisTech and Chimie ParisTech) and Arts-et-Métiers ParisTech, on the one hand, and biomedical and health sciences at Université Paris Descartes, on the other.

Teaching faculty is mostly from the partner institutions. Guest lecturers include hospital clinicians (AP-HP), and researchers from other schools and universities as well as from private companies (e.g. GE Healthcare, Philips Healthcare, Renault, Sanofi, Thalès, Materialise Medical, ...).

Learning outcomes

The BME-Paris Master proposes a program of excellence intended for students with a wide variety of backgrounds (biology, chemistry, physics, mathematics, engineering as well as medicine, pharmacy and other health sciences...).

The overarching goals of the Master are:

- * to provide students with the knowledge and tools required in a wide range of the biomedical engineering fields;

- * to foster a fruitful collaborative spirit between engineering and medical students, that will eventually bridge the existing « culture gap » between the corresponding professions.

While the second year (M2) offers five specialization tracks, the first year (M1) is devoted to strengthening and broadening students' skills in specific engineering and biomedical subjects. Students are advised in their individual choices of teaching units, to bring them up to date on the fundamental science subjects they may not have acquired through their previous studies (eg physiology and anatomy for engineering students, or signal processing and mechanics for biology or medical students).

Molecular and Cellular Biotherpies (MCB) is one of the 5 M2 proposed tracks.

OBJECTIFS

The MCB track concerns two major categories of biotherapeutics applications: cell and gene therapy, and biopharmaceuticals. Cell and gene therapy differs from drug therapy in that it concerns the use of 'custom or "à la carte" therapeutic agents created for an individual patients, a domain in which few manufacturers operate. Biopharmaceuticals are complex macromolecules created by biotechnology, and involve genetic manipulation of living organisms, which differ from conventional chemically synthesized small molecules.

The specific pharmacological and immunological features of biotherapy products, considered to constitute a new

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generation of drugs, are studied in conjunction with the characteristics of target populations, clinical follow-up, and biological monitoring. The aim of this track is to train students of advanced scientific level in the field of biotherapy in order to prepare for careers in academia. These students may also find opportunities in industry at the national, European, and international level, particularly in biotechnology and medical research laboratories in teaching hospitals), as well as in cell and gene therapy firms.

COMPÉTENCES VISÉES

- Respect scientific ethics
- Design and develop scientific projects
- Implement a project, define the objectives and context, carry out and evaluate the action
- Conduct and develop scientific and technical projects
- Analyze, diagnose and interpret the results of scientific experiments
- Know how to assess professional risks, implement specific evaluation methods
- Master specific methods and tools

Cross-curricular skills

- Work independently, manage time, self-evaluate.
- Use information and communication technologies.
- Conduct information research, identify access modes, analyze relevance, explain and transmit.
- Write clearly, prepare appropriate communication materials.
- Scientific communication in English.
- Working as a team: integrating, positioning, collaborating.

- Integrate into a professional environment: identify your skills and communicate them.

Programme

ORGANISATION

La formation se déroule en anglais, à temps plein.

Deux stages de 2 mois obligatoires en Master 1 et un stage de 5 mois obligatoire en Master 2 dans un laboratoire de recherche académique, hospitalier ou industriel.

STAGE

Stage : Obligatoire

Durée du stage : 2 x 2 mois en M1, 5 mois en M2

Stages et projets tutorés :
OUI

Admission

Etudiants français et étrangers titulaires d'une licence ou d'un Master scientifique, étudiants en médecine ou en pharmacie, élève ingénieurs.

PRÉ-REQUIS

C1 level in English (TOEIC, TOEFL, ...).

Et après ?

POURSUITE D'ÉTUDES

Opportunities

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* PhD in a field related to the M2 track followed by the student, in academia or jointly with a company (CIFRE PhDs).

* R&D positions in large companies or startups, in almost all activity biomedical and biotech sectors.

* Continuing medical or pharmacy school, or accessing it (« passerelle »), in either 2nd or 3rd year.

Business programs in biotech management (ESCP, EM Lyon / Centrale Supélec...)

PASSERELLE

Passerelle vers médecine, pharmacie ou odontologie

Contacts

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En bref

Composante(s)

UFR des Sciences fondamentales et biomédicales

Etablissements co-accrédités

- Ecole Nationale Supérieure d'Arts et Métiers (ENSAM)
- Université PSL

Niveau d'études visé

BAC +5

Durée

2 ans

ECTS

120

Modalité(s) de formation

- Formation initiale
- Formation continue

Validation des Acquis de l'Expérience

Oui

Langue(s) des enseignements

- Anglais

Lieu de formation

Campus Saint Germain des Prés

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