PHARMACEUTICAL TECHNOLOGY AND BIOPHARMACY

SECOND-YEAR MASTER'S COURSE (M2)

Master's managers: Prof. Florence Agnely and Prof. Véronique Rosilio

www.physpharmtech.universite-paris-saclay.fr

This one-year cursus is designed for students interested in careers in industrial research & development departments or academic institutions (university, public research organization, hospital) in the field of formulation, pharmaceutical technology and biopharmacy. Students acquire knowledge, skills and competence in the fields of solid dosage forms (tablets, capsules), dispersed systems (emulsions, suspensions, colloids), and innovative drug delivery systems with focus on addressed drug micro- and nanocarriers, nucleic acids and proteins delivery, and controlled release.

COURSE UNITS (60 ECTS)

MODULE 1 – Basic methodology (6 ECTS).
Delivery method: Theoretical teaching and workshops designed to help students improve their working methods and gain autonomy.
- Training in bibliographic research and critical analysis (technical and scientific literature)
- Techniques of oral and written scientific communication
- Optimization of experimental research
- Factorial experimental design
- Regulatory aspects of research and development
- Assessment of competencies and simulation of job interviews
- Project and team management
- Associative activity (Galen'idea)

MODULE 2 – Physico-chemical approaches to innovation in pharmaceutical technology (**11 ECTS).**
Delivery method: In-depth teaching on the physico-chemical properties of solid and dispersed systems and the techniques available to characterize them.

- Physicochemical approach to the rational formulation of solid granular systems, liquid and semi-solid forms (interfaces, amphiphiles, polymers, colloids, etc.)
- Techniques for characterizing formulations: rheology, tensiometry, granulometry, zetametry, calorimetry, imaging, light, x-ray and neutron scattering.

MODULE 3 – Conception and biopharmaceutics of innovative pharmaceutical forms (**7 ECTS)**.
Delivery method: Lectures and group works on the development of new pharmaceutical systems

- Biopharmacy, sustained release, bioadhesive systems
- Molecular systems for drug delivery, including caged molecules.
- Supramolecular systems for drug delivery
  - Self-organizing systems
  - Micro-and nanosystems
- Innovative pharmaceutical systems for products of biotechnology
  - Formulation of nucleic acids, proteins, peptides, and vaccines

MODULE 4 – Technology and Processes (6 ECTS).
Delivery method: Theoretical teaching and project work in partnership with staff from industry, allowing students to acquire expertise in industrial applications and scale-up and thereby facilitate communication between research and development and production departments.

- Pharmaceutical processes (blending, milling, granulation, compression, drying, freeze-drying)
- Scale-up
- Quality by Design (QbD) and Process Analytical Technology (PAT)

COMPULSORY INTERNSHIP IN INDUSTRY OR IN A RESEARCH LABORATORY (6 MONTHS, 30 ECTS)

STUDENT TRIP: International Conference or visit of pharmaceutical companies (GALEN'IDEA).