



This Bachelor degree program prepares specialists in drug R&D, preclinical research and commercialization through a truly multidisciplinary approach that studies pharmacological targets up to the market introduction of new drugs, including the development of new molecular entities. It deals with basic biomedical sciences with a particular emphasis on understanding and analyzing interactions between chemical compounds and living organisms.

In the course of this training, students are immersed in various specialty studies of pharmacology, e.g. pharmacokinetics and pharmacodynamics, and learn the innovative methods and advanced techniques used in academic and industrial labs. They acquire diverse skills and knowledge of the drug industry, from classification to adverse effects, including applicable regulations and action mechanisms. Such professional versatility is sought after in many areas of the constantly evolving world of pharmacology.

WHAT OUR STUDENTS CAN DO FOR YOU

Specific techniques

- Animal experimentation (in vivo, in vitro and ex vivo)
- PK/PD analysis
- Binding studies and enzymatic assay development
- HPLC analysis
- Molecular modeling
- Hepatic metabolism of drugs
- ADME
- Formulation
- Identification and characterization of a pharmacological target

Other techniques

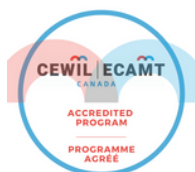
- DNA and RNA extraction and characterization
- Cloning and transfection
- PCR and real-time PCR analyses
- Cell culture
- Production, purification and characterization of proteins
- Immunological detection
- Chromatography and electrophoresis
- Quality control

Project management

- Development of experimental protocols
- Using biostatistics databases
- Reporting
- Preparing an investigator brochure (IB)

Regulatory affairs

- Clinical protocols (phases I, II and III)
- Recruiting volunteers and patients
- SOP and GLP applications



KNOWLEDGE AND SKILLS

| Term | Description |
|------|---|
| S-1 | Chemical and biochemical properties of compounds; cellular and human physiology; principles of pharmacology (PK/PD); working with databases; aseptic work; microscopy; culture of microorganisms. |
| S-2 | Synthesis and purification of an organic compound; HPLC, formulation; LogP; extraction and purification of proteins, RNA and DNA; biostatistics team project (clinical database and SPSS); integration of the concepts of absorption, distribution, metabolism and excretion (ADME). |
| S-3 | Pharmacological, behavioral and clinical notions of the nervous system: modes of action of antimicrobials and antineoplastic agents; human genetics; enzymology; cellular biology; applied project in protein and molecular biochemistry (purification, enzyme assays, immunoblot testing, RT-PCR, DNA analysis). |
| S-4 | Pharmacological and clinical concepts: cardiovascular, renal, intestinal and lung; immunology; radiation imaging; cell biology project: cloning, eukaryotic cells culture, transfection and reporter gene testing; writing an experimental protocol (SOP); in vitro/ex-vitro pharmacodynamics lab; CCAC training. |
| S-5 | GLP, GCP, GMP, SOP; epidemiology; notions of pharmacoeconomics; preparing an investigator brochure (IB); writing clinical protocols for phases I-III; ethics in pharmaceutical research; molecular modeling; applied pharmacotherapy. |
| S-6 | Basics of toxicology and pharmacovigilance; intellectual property; seminars; experimental pharmacokinetic laboratory (ADME); preparing and presenting a business plan. |

ORGANIZATION OF STUDY (S) AND WORK TERM (W)

| 1st year | | | 2nd year | | | 3rd year | | | 4th year |
|----------|-----|-----|----------|-----|-----|----------|-----|-----|----------|
| FALL | WIN | SUM | FALL | WIN | SUM | FALL | WIN | SUM | FALL |
| S-1 | S-2 | | S-3 | W-1 | S-4 | W-2 | S-5 | W-3 | S-6 |