

Master Bioinformatique – Parcours : In Silico Drug Design : bioactive molécules international

SCIENCES, TECHNOLOGIES, SANTÉ

Présentation

The « **In silico Drug Design-Design in silico of bioactive molecules**, ISDD-Bioactive molecules» program is at the intersection of structural biochemistry, chemistry and in silico approaches. It responds to the needs of both the private and academic sectors to train professionals in the therapeutic innovation domain and for computational research of therapeutic molecules. This research domain is flourishing in Europe and in the world. This program is dedicated to bioactive molecule modeling and in silico pharmaceutical chemistry. It is built on specialties of different international universities and visiting professors and researchers. This program creates the possibility for earning a Franco-Italian double diploma: ISDD-Bioactive molecules and the Laurea Magistrale in Scienze Chimiche, from the Università degli Studi di Milano

Ce parcours forme les étudiants aux approches in silico, notamment à la chimoinformatique, à la bioinformatique structurale, à la modélisation des structures tri-dimensionnelles, à la modélisation computationnelle de leurs interactions avec les molécules médicaments, aux biostatistiques et à l'analyse de données, à la bioinformatique structurale et aux logiciels de docking et de criblage. Les trois premiers semestres se déroulent à l'université de Paris.

For further information : <http://isdteach.sdv.univ-paris-diderot.fr>

This university program is in the Graduate Schools of Drug Development and Translational Bioinformatics at Université Paris Cité. It connects master's and doctoral courses with advanced research labs.

* The Graduate School of **Drug Development** focuses on creating new drugs, covering all stages from design to clinical use. [Read more >](#)

* The Graduate School **Translational Bioinformatics** teaches students advanced bioinformatics techniques for the evolving healthcare and personalized medicine challenges. [Read more >](#)

OBJECTIFS

This program trains professionals from the private and public sectors, both in France and in Europe, who are involved in research through in silico approaches in the field of therapeutic innovation and/or oriented towards the development of pharmacological molecules.

The ISDD program provides training in all tasks related to the « Drug Discovery» process using in silico approaches, from theoretical to applications (for example, virtual screening of therapeutic targets, drug safety...)

It offers to students training in chemical biology based on the fundamental principles of chemistry, biochemistry, biophysics, pharmacology, molecular medicine, information technology, bioinformatics and biostatistics.

COMPÉTENCES VISÉES

With this program, the students will acquire sufficient skills to process computational-aided drug design in drug discovery and/or drug safety. More precisely, the students will gain competence in programming, algorithmic, biostatistics, math, molecular modelling, cheminformatics, structural bioinformatics, data analysis, virtual screening, docking and molecular dynamic. There are many "work-

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together” projects, training the students to work as a team in a multidisciplinary domain. They have the possibility to perform an internship abroad, providing an opportunity to them to integrate international research project and to develop their ability to adapt to different project management and cultures.

Programme

ORGANISATION

The « In silico Drug Design-Design in silico of bioactive molecules, ISDD-Bioactive molecules» program, include a first semester in chemoinformatic at the university of Strasbourg, a second semester related to molecules bioactives at the university of degli studi di Milano. The semester 3 is on drug design and virtual screening at the university of Paris Diderot and the fourth semester is an internship on a research project in France or in a foreign country.

Many “team building” projects are proposed in the third semester.

At the end of the training, students are able to develop and apply diverse computational approaches for the identification of new hits molecules.

Numerous joint projects teach them to work in teams and to carry out their work in this multidisciplinary field.

The strong international orientation of this Master's degree allows students to develop their ability to adapt to different research systems and to integrate into international research projects. The multidisciplinary of the program is supported by universities of excellence at Paris Diderot, Strasbourg and Degli studi di Milano, and the involvement of national and international experts.

This program is made up of the following UEs:

Semester 1 (University of Strasbourg)

- Methodology (10 ECTS)

- Molecular Modeling (8 ECTS)

- Chemoinformatics (10 ECTS)

- Communication (2 ECTS)

Semester 2 (University Degli studi di Milano - Italy)

- Programming in C (6 ECTS)

- Structural Biology and enzymology (6 ECTS)

- Medicinal chemistry (6 ECTS)

- Simulation, Modelling and Biomolecules (6 ECTS)

- Bioactive molecules or equivalent module (6 ECTS)

Semester 3 (University of Paris)

- Data analysis in drug design (8 ECTS)

- Molecular analysis and dynamics & drug design (7 ECTS)

- High throughput screening : structure & ligand-based (5 ECTS)

- Molecular Space Analysis (4 ECTS)

- Preparation for Research in Drug Design (6 ECTS)

Semester 4

- Internship (30 ECTS)

TUTORAT

Tutored projects are proposed in the EUs within semester 3.

STAGE

Stage : Obligatoire

Durée du stage : 5-6 months in Master2

Stages et projets tutorés :

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The last semester is an introductory research internship in academic and industrial laboratories in France or abroad.

Admission

This program is for students preferably with a background in chemistry or pharmacy or biologist with a strong interest in chemistry and informatic.

PRÉ-REQUIS

A degree in chemistry, pharmacy, biomedical sciences (with an interest in computer science) or computer science (with knowledge of chemistry or biology) is a prerequisite. Since M1 and M2 are taught in English, a B2 level is required at the entrance of M2.

Droits de scolarité :

Les droits d'inscription nationaux sont annuels et fixés par le ministère de l'Enseignement supérieur de la Recherche. S'y ajoutent les contributions obligatoires et facultatives selon la situation individuelle de l'étudiant.

Des frais de formation supplémentaires peuvent s'appliquer au public de formation professionnelle. Plus d'informations [ici](#).

Et après ?

POURSUITES D'ÉTUDES

There are many opportunities to pursue a PhD in France or abroad, but also opportunities for direct integration into a professional environment .

TAUX DE RÉUSSITE

100%

The outlets are for research and professional purposes, the orientation is made at the level of the choice of research internships in academic laboratories or private companies. 98% of the students are recruited within 2 years after their Master's degree, more than 60% within 2 months after the Master's defense.

DÉBOUCHÉS PROFESSIONNELS

There are many opportunities to pursue a PhD in France or abroad, but also opportunities for direct integration into a professional environment (pharmaceutical industry or EPST) after the Master's degree (or during the work-study program). It offers opportunities in pharmaceutical industries and "start-ups", national or international, private or academic research laboratories, or allows them to continue their studies by completing a French or international PhD. Students obtain positions as engineer, research assistant or manager directly after the M2 or as project manager, researcher, platform manager, after a thesis..

Researcher and project manager in structural bioinformatics, chemoinformatics, biostatistics, molecular modeling, in silico drug design, in chemical and pharmaceutical industries, in public or private drug design research and development laboratories, in pharmaceutical sectors, EPST such as CNRS, INSERM, INRA, CEA, hospitals.

Platform engineer in chemoinformatics, screening, structural bioinformatics, data analysis for the public service specialized

Contacts

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Formation Continue

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En bref

Composante(s)

UFR Sciences du Vivant

Niveau d'études visé

BAC +5 (niveau 7)

ECTS

120

Public(s) cible(s)

- Étudiant

Modalité(s) de formation

- Formation initiale
- Formation continue

Validation des Acquis de l'Expérience

Oui

Langue(s) des enseignements

- Anglais
- Français

Capacité d'accueil

20

Lieu de formation

Campus des Grands Moulins

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