



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA
DEPARTMENT OF PHARMACY AND
BIOTECHNOLOGY

Biotechnological, Biocomputational, Pharmaceutical and Pharmacological Sciences

PhD Programme 2020-2021

PhD



Our three-year programme provides outstanding students with excellent interdisciplinary, research-oriented studies in biotechnological, biocomputational, pharmaceutical and pharmacological sciences. We train full-time students to acquire and utilize the knowledge necessary for their research projects focused on the discovery of new therapeutic targets as well as of new drugs and to study their profile of efficacy and safety. The discovery of novel drug targets, in fact, is followed by the creation of new drugs from the study of molecular entities and the examination of receptors, enzymes or intracellular signaling pathways that may contribute to a specific disease and / or its progression. It is proposed to PhD students an integrated cross training, useful for their future employment access in pharmaceutical and biotechnology companies.

The aim is to create multi-disciplinary projects involving different research teams of the University of Bologna, the majority at the Department of Pharmacy and Biotechnology. PhD students are expected to benefit from the informal network with foreign partner organizations. The majority of their training period will be spent at the University of Bologna; furthermore, a limited number of positions are available in partnership with the Italian Institute of Technology (IIT, Genoa). Mobility of enrolled students towards foreign organizations for six months is assured. This exchange gives students the chance to experience working in a different country and to promote international collaboration and mobility.

PhD Programme

Biotechnological, Biocomputational, Pharmaceutical and Pharmacological Sciences

The aim is to train young researchers to become experts in the biotechnology, bioinformatics, pharmaceutical and pharmacological fields to favor their enrollment in pharmaceutical companies or to work in the area of other industrial processes.

The PhD degree is awarded after at least 3 years of attendance and the drafting of a thesis. At the end of the programme, PhD candidates will defend his/ her dissertation in front of an examination committee. The themes of the new PhD programme are mainly focused on: a) studies of living systems or at cellular and molecular level, or on native or recombinant DNA products; b) synthesis, characterization, analysis, delivery, efficacy and safety of new drugs, including those obtained through biotechnology; c) biocomputational approaches useful to discovery new therapeutic targets and to characterize drug-ligand interactions; d) development of pharmacological and toxicological issues focused on the study of the mechanism of action and toxicological aspects of bioactive molecules; e) studies of genetic and epigenetic profiles in response to drug treatments and identification of risk factors associated with chronic degenerative diseases; f) development of suitable animal models of diseases for the evaluation of new compounds already studied in in vitro models.

The PhD programme is distinguished by an interdisciplinary approach and by a relevant transversality of the key research fields.

Disease can be caused by an imbalance in molecular signaling pathways; therefore, chemical and/or biological drugs that modify or rebalance these pathways should have a therapeutic potential. The development of reliable mechanisms for target identification is actually a priority. Within this context, a bioinformatics approach that combines biological concepts with informatics is mainly used to discover, select and prioritize targets. Disease relevant molecular, cellular and organism models employed in the genomics and proteomics research area represent invaluable tools to investigate small molecules and innovative biotechnological drugs with any potential target's function and to understand their mechanism(s) of action.

Training of the doctoral candidates will be done spending the majority of time in a resident laboratory where they develop the thesis project together with a possible rotation in other laboratories of University of Bologna and in non-academic (at least one abroad) and academic participants.

Training to gain new, transferable skills is mandatory. These include communication, teamwork, project management, ethics and knowledge of basic economy. The PhD Programme Committee assigns to each candidate a supervisor with adequate experience and in charge with following and evaluating the doctoral student's research project. Furthermore, a professor or an expert from the non-academic sector where the PhD candidate carries out his/her research can be designed as co-supervisor; this person will produce also a written opinion concerning the doctoral thesis of a particular candidate.



PROGRAMME STRUCTURE

First year	Second year	Third year
The PhD Programme Committee assigns a Supervisor to each candidate	Development of an independent research project for the thesis under the control of a Supervisor and the Ph.D. Programme Committee	Conclusion of the research project
Introductory weeks and allocation in a laboratory start of the training	Participation to Conferences, mainly international, possibly with own Scientific presentations	Thesis writing and submission
Participation to a research project	Participation to seminars (mainly in English)	Participation to Conferences, mainly international, possibly with own Scientific presentations
Enrollment in any specific course	Enrollment in any specific course	Participation to seminars (mainly in English)
Mandatory courses: Funding possibilities, Career planning, Bioinformatics, Scientific English	Summer and Winter International Schools	Summer and Winter International Schools Gain of transferable skills
Participation to tutorials and seminars (mainly in English). First midyear result presentation day	Mobility to any academic or non-academic institution abroad	Possible supervision of undergraduate students
Summer and Winter International Schools		PhD Annual retreat
Participation to Conferences	PhD Annual retreat	Thesis Defense
PhD Annual retreat		Post graduation monitoring of publications



A QUICK GUIDE TO THE PROGRAMME

Duration: 3 years. A full-time commitment is requested.

Doctoral cohort: 9-10 students per year.

Admission procedure: The specifics of the admission requirements and procedures are described in detail in the call. The selection criteria to be admitted are based on a pre-selection made on the basis of a detailed CV and a written master thesis (if available), followed by an oral exam. After the admission, procedural steps include: 1) the PhD programme committee will assign a supervisor to each PhD student expert in the research field chosen by the candidate and approved by the Committee; 2) start of a research project and participation to all the scientific activities; 3) at the end of the first year PhD candidates indicate the research project of their thesis.

Immigration requirements for international applicants: For international applicants additional administrative procedures may also apply in relation to visa, residence permit requirements set by the government. The personnel of the Doctorate office will assist you in applying for the necessary permits.

Scholarships: PhD candidates receive a scholarship from the University of Bologna or from Public Research Agencies (i.e. Italian Institute of Technology - Genoa) or from private companies. International students are supported by: Erasmus Mundus scholarships, Marie Skłodowska-Curie scholarships; China Scholarship Council; other international Programmes.

Doctoral training partnership with Italian Institute of Technology (IIT, Genoa): This partnership provides excellent research opportunities for PhD candidates that carry out their research mainly at IIT, to ensure students are equipped with the skills and experiences to allow them to become world-leaders in their chosen careers.

Mobility: Candidates spend the majority of their training at the University of Bologna or of the partner; however, mobility towards foreign universities or companies is mandatory for at least six months.

The triple "i" dimension of the PhD Programme: Inter-disciplinarity: The Programme will favor scientific collaborations among PhD candidates involved in different research projects and will offer possibilities for laboratory rotations or visits. Inter-sectoral dimension: PhD candidates will follow specific courses, tutorials, seminars and attend to meetings in different scientific areas; on the whole all for 70 hours/year. These will be partitioned in courses, tutorials and seminars shared with other PhD Programmes or specific for this Programme and held also from invited foreign teachers and professors. PhD candidates are encouraged to attend international meetings to present the results of their research. International dimension: it is mandatory for the PhD students enrolled in this programme to spend a period of time (up to 6 months) in a foreign academic organization or in a non-academic sector, with the aim to acquire specific sets of skills.

First midyear result presentation day: Enrolled PhD candidates are invited to do a brief presentation of the early research done in the first six months after admission. This meeting is designed to encourage active student participation and discussion in an informal atmosphere.

Annual retreat: The PhD Programme Committee will invite representative of the academic and non-academic sectors that will contribute to the PhD candidate training, to participate to an annual meeting where candidates will present the scientific results obtained. These meetings will represent a good occasion to further strengthen interdisciplinary and inter-sector training afore mentioned. These reports are an important tool for the PhD candidates and the supervisors to keep the PhD programme on track. The reports can be considered milestones for the programme. They assess the work of the last year and plan for the coming year or in the case of the last year, the PhD programme Committee will evaluate to admit the candidates to the thesis defense.

Thesis defense: The doctoral thesis should reports the results of the independent research carried out by PhD candidates. It should reveal the ability to formulate a problem or research question, gather, analyze and interpret source material, demonstrate knowledge of the literature relating to the subject, describe the methods and procedures used, report the results, and display the researcher's ability to discuss fully and coherently the meaning of the outcome of his/her research. Thesis defense will consist of a presentation of the thesis project (about 20 minutes), followed by questions from the audience and the examiners about the thesis content and the research field.

SEMINARS, CONFERENCES AND SCIENTIFIC MEETINGS

Seminars, conferences and scientific meeting

PhD students will follow specific courses, tutorials and seminars in different scientific area; on the whole all for 70 hours/year. These will be held also from invited foreign teachers and professors. PhD students can follow any course of masters in Bioinformatics, Pharmaceutical Biotechnology or in any other master promoted by the Department of Pharmacy and Biotechnology. Furthermore, Doctoral students are pursued to participate to Summer or Winter Schools and international conferences on topics inherent to their research project. Each year the University of Bologna organizes one international summer and one winter school on topics of the PhD programme.

GRANTS, INFORMATION, CONTACT

GRANTS

All admitted candidates will receive a financial support package which includes a grant of approximately 13,650 € (yearly) to cover living expenses during the 3 years of the degree. On top of this, PhD candidates will receive up to 1,343 €/year (for the second and third year of the degree) to cover their participation to meetings; furthermore, a grant increment (up to 2,050 €) will be available if they spend a visiting period abroad up to six months.

IMPORTANT DATES

<https://www.unibo.it/it/didattica/dottorati/2020-2021/scienze-biotecnologiche-e-farmaceutiche>

CONTACTS AND INFORMATION

www.unibo.it/PhDprogrammes33

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THE UNIVERSITY OF BOLOGNA

Born in 1088, and considered to be the oldest university in the Western world, the **University of Bologna** has been student-centred, attracting prominent figures from science and the arts. Today it is a leader in Europe and famous for its beauty and integration with the city. Its teaching catalogue is diversified and tailored to the needs of present-day society: **over 200 degree programmes, over 70 professional masters a 45 PhD programmes, 41 specialisation courses**, all among its 33 Departments, 11 Schools and over 81,000 students. A further 5,000 are candidates for its PhDs and 3rd cycle programmes. Bologna has always favoured a multi-disciplinary, cross-cultural approach; it invests in international, multicultural training, research and services. It has formed knowledge alliances with industry and public/private organizations, and is a hub of international networks.

Besides the five campuses (Bologna, Cesena, Forlì, Ravenna, Rimini), there is an overseas branch (Buenos Aires) coordinating activities with Latin America. Beyond its close European links, Alma Mater enjoys multiple international connections with North America, Africa, Asia and Australia. It is a public, independent and pluralistic institution.



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The mission of the **Department of Pharmacy and Biotechnology (FaBiT)** concerns the study of biological systems and molecular mechanisms underlying the physiological and pathological processes in prokaryotes and eukaryotes, the development of innovative biotechnologies, as well as the study and development of drugs and products for health in their biocomputational, biochemical, physiological, pharmacological, toxicological, chemical and technological.



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