



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA
DEPARTMENT OF PHARMACY AND BIOTECHNOLOGY

Cellular and Molecular Biology

PhD Programme
2020-2021

PhD



The PhD program in Cellular and Molecular Biology offers a strong multidisciplinary research environment with a diversity of scientific activities and methodologies and it is aimed at training enthusiastic and highly motivated students on their path to a scientific career in post-genomic sciences. The Department of Pharmacy and Biotechnologies hosts more than 50 PhD students trained in several disciplines. The research groups working in our PhD program in Cellular and Molecular Biology cover the areas of genomics and bioinformatics, cancer and neurological diseases, molecular and structural biology, microbiology and plant physiology.

The program consists of both lecture courses and lab projects. Weekly seminars are offered by department or visiting researchers. Attention is given to complementary skills such as fund-raising abilities, grant and scientific paper writing, public and scientific presentation (including annual workshops). Each PhD student will be responsible of a personal research project, tutored by a group leader and s/he will spend a period in a foreign research institution. The flexibility of the program allows the adaptation to the specific interests of each candidate.

PhD Programme in Cellular and Molecular Biology

The PhD program in Cellular and Molecular Biology offers top-level research projects and training on complementary skills in a strong multidisciplinary research environment.

The research topics of the PhD program in Cellular and Molecular Biology are:

1. Cancer genome instability (Prof. Capranico)
2. Molecular biotechnology of phages for the development of theranostic vector platforms (Prof. Danielli)
3. Computational and functional genomics (Prof. Ferrè)
4. Computational transcriptomics of human gene networks (Dr. Giorgi)
5. Genetic factors of autism syndromes (Prof. Maestrini, Dr. Bacchelli)
6. Molecular basis of neurodegenerative diseases (Prof. Monti)
7. Gene expression regulation in cancer (Prof. Perini)
8. Cancer modelling in *Drosophila* (Prof. Pession)
9. Mitochondria disfunctions in neurodegenerative diseases and mitochondria gene mutations in cancer (Prof. Porcelli, Prof. Ghelli)
10. Molecular and genetic basis of bacterial pathogenesis (Prof. Scarlato)
11. Molecular mechanisms of redox signalling and energy metabolism regulations in plants (Prof. Trost, Prof. Sparla)
12. Phylogenetic and functional characterization of human and environmental microbial communities: study of the interactions between microorganisms and their habitat (Prof. Vitali)
13. Structures, functions and interactions of metallo-proteins (Dr. Zambelli)

Not counting the common training activities, the program includes activities aimed at the acquisition of skills in planning, implementation and critical interpretation of the obtained experiments, as well as at executing a specific research project agreed upon with the faculty members of the PhD program. Candidates develop and consolidate their knowledge through weekly departmental seminars, specific theoretical courses, participation for national and international conferences, discussion of experimental results both within the research group and the Faculty, as well as annual PhD student workshops. Each candidate will spend a period in a research institution abroad. In order to obtain the title, the PhD candidate must be an author of publications in peer-reviewed scientific international journals with impact factor and/or chapters in books and/or reports in the form of oral or poster presentation at international/national conferences and/or international/national patent

RESEARCH AREAS

Genomics and bioinformatics

Microbiology and plant physiology

Cancer and neurological diseases biology

Structural biochemistry and nanobiotechnology

PLACEMENT OF OUR PHD GRADUATES

University of California at San Diego (La Jolla, CA, USA)

Université de Toulouse, CNRS (Toulouse, France)

San Raffaele Scientific Institute (Milano, Italia)

University of Cambridge (UK)

Oxford University (UK)

University of Georgia (Athens, USA)

Aachen University (Germany)

Greiner Bio One, GmbH (Germany)

Université Lyon (France)

Ecole Polytechnique Fédérale de Lausanne (EPFL, Switzerland)

Carlsberg Laboratory (Copenhagen, Denmark)

University of Bonn (Germany)

National Institutes of Health (USA)

Netherland Cancer Institute (Amsterdam, The Netherlands)

PROGRAMME STRUCTURE

Topics common to all the PhDs programs of the Department

Handling of Radioisotopes in Biology (12 hours).
Lecturer: Prof. A. Danielli

Basic course in Science of Laboratory Animals (12 hours) Organizer: Dr. Valentina Vasina

English for academic purposes (20 hours).
Organizer: Prof.ssa Monica Turci

Introduction to research funded by the European Union and Enhancement Protection of Intellectual Property (6 hours). Organizer: ARIC - Dott. Simone Maccaferri e Dott.ssa Maria Grazia Fumo

Biocrystallography (16 hours).
Responsabile: Dr. Luca Mazzei

Specific courses for the PhD program

2 annual workshops on the topics of Research in Molecular and Cellular Biology (16 hours).
Organizer: Prof. V. Scarlato

Calorimetry and light-scattering: Theory and applications for the characterization of proteins in solution (14 hours). Lecturer: Dr. B. Zambelli

Course on a specific topic of the PhD thesis (20 hours): Each supervisor will held a course on the subject of the research thesis.

Seminars and tutoring activities

Seminars that are common to most the PhDs programs of the Department to which pertains (20 hours/year taught by teachers/experts in the field).

Seminar or series of seminars for the specific doctorate (15 hours/year held by teachers/experts in the field).

Tutoring activities in the teaching laboratory courses Degree and / or Master's Degree related to the research topics addressed (maximum 60 hours/year).

THE PhD TEAM

The PhD Director:
Prof. Giovanni Capranico
Department of Pharmacy and BioTechnology,
University of Bologna.
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The PhD Deputy Director:
Vincenzo Scarlato
Department of Pharmacy and BioTechnology,
University of Bologna.
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SUBJECT MATTER AND FACULTY MEMBERS

GENOMICS AND BIOINFORMATICS

Prof. Bacchelli, Prof. Capranico, Prof. Ferrè, Prof. Giorgi, Prof. Maestrini, Prof. Perini, Prof. Scarlato, Prof. Vitali

MICROBIOLOGY AND PLANT PHYSIOLOGY

Prof. Danielli, Prof. Scarlato, Prof. Sparla, Prof. Trost, Prof. Vitali

CANCER AND NEUROLOGICAL DISEASES BIOLOGY

Prof. Capranico, Prof. Perini, Prof. Pession, Prof. Maestrini, Prof. Monti, Prof. Porcelli, Prof. Ghelli

STRUCTURAL BIOCHEMISTRY

Prof. Zambelli, Prof. Trost





GRANTS, INFORMATION, CONTACT

GRANTS

All admitted candidates will receive a financial support package which includes a grant of approximately 13,650 Euros (yearly) to cover living expenses during the 3 years of the degree.

On top of this, PhD candidates will receive a grant increment (up to 2,050 Euros) if they spend a visiting period at a prestigious international university.

The University of Bologna PhD in Cellular and Molecular Biology offers 7 fully funded grants.

How to apply for a PhD programme

<https://www.unibo.it/en/teaching/phd/information-enrolling-phd-programme/how-to-apply-phd-programme>

Contacts:

AFORM - SETTORE DOTTORATO DI RICERCA, via Zamboni 33
40126 Bologna; aform.udottricerca@unibo.it



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.



The **Department of Pharmacy and Biotechnologies (FaBIT)** promotes and coordinates research and teaching in the chemical-pharmaceutical-technological, biomedical, biotechnological, biological and molecular biological. The department was founded in 2012 and it bases its originality in the aggregation of some sectors of the previous Faculty of Pharmacy with groups involved in Biotechnology. The primary purpose of this Department is the promotion and development of advanced interdisciplinary research projects and of the connected educational offerings of the I and II cycles of university education.



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