



UNIVERSITA' DEGLI STUDI DI PADOVA



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DEGLI STUDI
DI PADOVA

Ph.D. Course in Molecular Medicine

The Ph.D. Course in Molecular Medicine (MM) at the University of Padova offers a highly competitive programme for a comprehensive education in the fields of Biochemistry, Biophysics, Molecular, Cell and Developmental Biology, Physiology, Microbiology, Virology and Gene Therapy. The Course offers state of the art working conditions in a challenging environment for talented researchers in the best academic research institution in Italy. MM offers a wide range of different programs. Students choose their field of interest under the direct supervision of one or more of the Ph.D. Course Board. The research project is complemented by advanced graduate courses designed to provide the students with state-of-the-art tools in selected areas of chemistry, materials science and biochemistry. Our students receive a broad training that prepares them equally well for careers in industry or academia. The Course enjoys strong ties with Italian and European private pharmaceutical enterprises allowing campus visits, seminars, and joint research activities.

[Coordinator and
Ph.D. Board](#)

[Educational goals and
didactic program](#)

[Research topics](#)

[Facilities](#)

[About DMM](#)

Università degli Studi di Padova
**Dipartimento di
Medicina Molecolare DMM**
Via A. Gabelli 63 - 35121 Padova



Ph.D. Coordinator

Prof. Stefano Piccolo

<http://www.bio.unipd.it/piccolo/>

Ph.D. Board

Cognome	Nome	Department	Qualifica	SSD	Curriculum
ALVISI	Gualtiero	MEDICINA MOLECOLARE	RU	MED/07	Biomedicine
BARZON	Luisa	MEDICINA MOLECOLARE	PA	MED/46	Biomedicine
CALISTRI	Arianna	MEDICINA MOLECOLARE	PA	BIO/19	Biomedicine
CASTAGLIUOLO	Ignazio	MEDICINA MOLECOLARE	PA	MED/07	Biomedicine
CORDENONSI	Michelangelo	MEDICINA MOLECOLARE	PO	BIO/17	Biomedicine
DE CARO	Raffaele	NEUROSCIENZE	PO	BIO/16	Biomedicine
DI IORIO	Mario Vincenzo	MEDICINA MOLECOLARE	RU	MED/07	Biomedicine
LOREGIAN	Arianna	MEDICINA MOLECOLARE	PO	MED/07	Biomedicine
MACCHI	Veronica	NEUROSCIENZE	PA	BIO/16	Biomedicine
MAIORINO	Matilde	MEDICINA MOLECOLARE	PO	BIO/10	Biomedicine
MANGANELLI	Riccardo	MEDICINA MOLECOLARE	PO	MED/46	Biomedicine
MUCIGNAT	Carla	MEDICINA MOLECOLARE	PA	BIO/09	Biomedicine
PARISI	Saverio	MEDICINA MOLECOLARE	PA	MED/17	Biomedicine
PAROLIN	Maria Cristina	MEDICINA MOLECOLARE	PO	BIO/19	Biomedicine
PICCOLO	Stefano	MEDICINA MOLECOLARE	PO	BIO/11	Biomedicine
PORZIONATO	Andrea	NEUROSCIENZE	PA	BIO/16	Biomedicine
RICHTER	Sara	MEDICINA MOLECOLARE	PO	MED/07	Biomedicine
TOPPO	Stefano	MEDICINA MOLECOLARE	PA	BIO/10	Biomedicine
URSINI	Fulvio	MEDICINA MOLECOLARE	PO	BIO/10	Biomedicine

Cognome	Nome	Department	Qualifica	SSD	Curriculum
BASSETTO	Franco	NEUROSCIENZE	PO	MED/19	Regenerative med.
BURRA	Patrizia	SCIENZE CHIRURGICHE ONCOLOGICHE E GASTROENTEROLOGICHE	PA	MED/12	Regenerative med.
CONCONI	Maria Teresa	SCIENZE DEL FARMACO	PO	BIO/16	Regenerative med.
DALLA VALLE	Luisa	BIOLOGIA	PA	BIO/06	Regenerative med.
DI LIDDO	Rosa	SCIENZE DEL FARMACO	PA	BIO/16	Regenerative med.
DUPONT	Sirio	MEDICINA MOLECOLARE	PA	BIO/17	Regenerative med.
FABRIS	Luca	MEDICINA MOLECOLARE	PA	MED/12	Regenerative med.
FARINATI	Fabio	SCIENZE CHIRURGICHE ONCOLOGICHE E GASTROENTEROLOGICHE	PO	MED/12	Regenerative med.
FLOREANI	Annarosa	SCIENZE CHIRURGICHE ONCOLOGICHE E GASTROENTEROLOGICHE	PA	MED/12	Regenerative med.
MARTELLO	Graziano	MEDICINA MOLECOLARE	PA	BIO/17	Regenerative med.
RUSSO	Francesco Paolo	SCIENZE CHIRURGICHE ONCOLOGICHE E GASTROENTEROLOGICHE	RU	MED/12	Regenerative med.
VINDIGNI	Vincenzo	NEUROSCIENZE	PA	MED/19	Regenerative med.



Educational goals and didactic program

The main objective of the Ph.D. Course is to form scientists with biological knowledge to apply to medicine with the final aim to understand the molecular bases of diseases and develop new diagnostic systems and new therapeutic and preventative tools. This knowledge in the fields of biochemistry, biophysics, histology, physiology, microbiology and biotechnology, will provide the student with a wide professionalism aimed to ideate and develop biomedical research projects both basic and translational.

The didactic program includes practical activity in the laboratory under the guidance of a tutor, attendance to seminars given monthly by external invited speakers, Summer Schools and preparation of seminars. Every 6 months a special seminar section (retreat) will be organized during which every student will expose the advancement of his/her data to the other students and to the Board members of the Course.

The students will be invited to attend national and international meetings of interest for their research and to participate to collaborate with other Italian and foreign research groups.

The teaching in the doctoral program is based on courses, some of them are specific and others are shared. They aim to provide a deep knowledge of the topics also thanks to practical training. Moreover, particular emphasis will be placed on the improvement of scientific writing and oral presentations in English, on bioinformatic competences (sequence and dataset analyses) and on communication skills.

The teaching in the doctoral programme is based on the following courses: some of them are specific for each curriculum and others are shared. They aim to provide a deep knowledge of the topics also thanks to practical training. Moreover, particular emphasis will be placed on the improvement of scientific writing and oral presentations in english, on bioinformatic competences (sequence and dataset analyses) and on communication skills.

Courses of "Biomedicine" curriculum:

- Next generation sequencing techniques;
- Biostatistic applied to omic sciences;
- Immunology;
- Regulation of transcription in virus, prokaryotes, and eukaryotes;
- Transgenesis applied to human pathology and gene finding;
- Molecular diagnostics and imaging

Courses of "Regenerative Medicine" curriculum:

- Biomaterials and biocompatibility;
- Cell adhesion: mechanisms, adhesion molecules, evaluation methods;
- Cell growth factors and evaluation tools;
- Cell differentiation factors and evaluation tools;
- Delivery systems of biologically active molecules

Training programs common to the two curricula but to be carried out with other PhD Courses:

- Improvement in the use of: English; Informatics; Communication skills



Research topics

Basic research are focused on the identification of molecular mechanisms driving cell differentiation, stemness, and involved in the pathogenesis of infectious, genetic, degenerative and neoplastic diseases. In particular: signal transduction mediated by growth factors and hormones; enzymes involved in the redox homeostasis of proteins involved in differentiation; genes involved in extracellular matrix biosynthesis; mechanical stimuli and wound repair; physiopathological basis of reproduction; micronutrients and vegetal antioxidants in degenerative and neoplastic diseases and in the aging; hepatitis C pathogenesis and hepatic fibrosis mechanisms; alteration of liver function after liver transplantation; structure and function of viral genes; genetic and biochemical mechanisms of resistance to antiviral drugs; characterization of the bacterial pathogenetic mechanisms; molecular basis of the physiopathological mechanisms of the nervous system; development and characterization of murine models.

Translational research aim to develop preventative agents (vaccines), diagnostic and therapeutic tools, including gene therapy, new anticancer drugs, and regenerative medicine. In particular: development of viral and bacterial vectors for gene therapy and vaccine delivery; development of new tools of molecular diagnostics based on "omic" sciences; bioelectronics and nano-biotechnologies: new materials at nanometric scale for the development of biosensors; biomarkers and predictability of the response to the therapy of chronic inflammatory gut diseases; development of diagnostic approaches and sterility therapy; cell and gene therapy of infectious, degenerative and neoplastic diseases; stem cells from peripheral blood, adipose tissue, enteric nervous system, and IPS (induced pluripotent stem cells); metallic, polymeric, and biological biomimetic surfaces; design, synthesis, and delivery of cell adhesion, growth, pro- and anti-angiogenic factors; in vitro reconstruction of vascular, tracheal, esophageal, liver tissue engineered substitutes; drug target finding; drug delivery.



Facilities

Laboratory space of about 2500 m². This space includes about 200 work-stations and is fully equipped with “state of the art” scientific instruments as i) high throughput DNA sequencing system, ii) real time quantitative PCR systems, iii) confocal microscope, iv) electronic microscope, v) cytofluorimeters, vi) fluorescent microscopes, vii) DNA microarray Hybridization station, viii) microarray scanner, ix) mass spectrometers, ix) traditional and next generation DNA sequenators, x) SNP and mutation analyzers.

- BL2 and BL3 Laboratory to manipulate dangerous infectious agents and recombinant microorganisms
- Certified animal house for GMO manipulation
- Microinjection system for transgenesis
- Laboratory of proteomics and protein chemistry
- Bioinformatic laboratory



Department of Molecular Medicine DMM

The work of the Department involves various fields which all converge on the study of biology and human pathology. The Department comprises personnel with reciprocal competences in biochemistry, biophysics, microbiology, virology, tissue, cell and molecular biology, environmental and forensic toxicology, infectiology and clinical medicine, chemotherapy, epidemiology, public health, and occupational medicine.

Cultural contiguity among these areas derives from integration between biomedicine and evidence-based medicine. Cultural contents stand out for their complementarity, with a central theme in advanced analytics and precise computational analysis.

The Department also works on advanced chemical and biochemical analyses and expects growing interest in bio- and nanotechnologies and other "-omic" technologies.

Laboratories

- [Acidi Nucleici](#)
- [Cancer genomics and transcriptomics](#)
- [Biochimica generale e metabolismo](#)
- [Genetica forense](#)
- [Laboratorio di Neurofisiologia](#)
- [Laboratory of Pluripotent Stem Cell biology](#)
- [LSDMG- Lysosomal storage disease modeling group](#)
- [Mechanobiology Laboratory](#)
- [Medicina Computazionale](#)
- [MycoLab](#)
- [Sviluppo Antivirali](#)
- [Trasduzione del segnale e cellule staminali](#)

