



UNIVERSITÀ  
DEGLI STUDI  
DI MILANO

Master's degree programme in  
**Medical biotechnology  
and molecular medicine**

FACOLTÀ DI

**Medicina e Chirurgia**

# Applications and admissions

With mandatory access test.

## Admission requirements

To be admitted to the entrance test, all candidates must possess 180 ects obtained in the Bachelor's degree, of which 50 in the following areas: BIO/09 (Physiology), BIO/10 (Biochemistry), BIO/11 (Molecular biology), BIO/12 (Clinical biochemistry), BIO/13 (Biology), BIO/14 (Pharmacology), BIO/16 (Human anatomy), BIO/18 (Genetics), BIO/19 (General microbiology), MED/01 (Medical statistics), MED/03 (Human genetics) MED/04 (General pathology and immunology), MED/05 (Clinical pathology), MED/06 (Medical oncology), MED/07 (Microbiology), MED/08 (Pathology), MED/09 (Internal medicine), MED/25 (Mental health), MED/26 (Neurology), MED/46 (Laboratory medicine), INF/01 (Informatics), FIS/07 (Medical physics).

For Italian, European candidates the selection will be on the basis of a competitive written entrance exam. The admission test consists of a written test based on multiple-choice questions, it will be in English and will include 50 questions on topics such as biology, biochemistry, physics, pharmacology, immunology, pathology, genetics.

\*For non-EU students resident abroad (applicants for a student visa), selection and ranking will be based on the assessment of the personal and scholastic curriculums and on an interview evaluation.

Applicants must have a good knowledge of spoken and written English at level B2, and certification (according to the Common European Framework of Reference for Languages (CEFR) must be provided upon registration of the admission test.

Bachelor's students getting their degree by December 31th can participate to the test, they will be accepted, in case of success, if they possess the prerequisites described above.

## Objectives

The Master Program in Medical biotechnology and molecular medicine is committed to form professionals, provided with a strong technical and theoretical background in order to develop scientific methodologies and coordinate research projects in the fields of applied biotechnology and translational medicine. The Master program will provide students with a strong educational background on the genetic and molecular bases of diseases and the pathophysiological mechanisms that occur in human beings in disease states, in order to develop biotechnology-based diagnostic and therapeutic strategies. This knowledge will be integrated with a specific formation in the fields of computer science, biophysics, nanotechnology and pharmacology. The Master Program is organized in common and curricular learning with insights into neuroscience, oncology, molecular diagnostics, immunobiotechnology and modelling and bioinformatics. The students will also learn about economic management of a scientific project, with emphasis on the construction of the business plan and cost analysis. The second year of the course is almost entirely dedicated to research activities, finalized to generate data for the preparation of the final exam.

## Career prospects

The objective of the course is to provide the scientific community with experts in the fields of Medical biotechnology and molecular medicine able to develop new experimental models for the study of human diseases, to develop new diagnostic approaches, to identify new therapeutic molecules, to devise innovative drug delivery systems.

Employment opportunities: public and private research structures, including Universities, CNR (National Research Council), Istituto Superiore di Sanità (National Institute for health); hospitals; private pharmaceutical, diagnostics and biotechnological companies; companies supporting scientific research (instruments, biotechnological reagents); companies involved in science communication and publishing.

The graduate, therefore, will find employment as:

- medical science liaison (MSL);
- clinical Monitor;
- market access manager;
- medical and scientific communication advisor.

# Degree syllabus

I year

COMPULSORY LEARNING ACTIVITIES COMMON TO ALL CURRICULA	ECTS PARTIAL	ECTS TOTAL
<b>I semester</b>		
Advanced microscopic techniques and nanotechnology		6
Applied pharmacology to biotechnology		7
Pathogenic basis of diseases - General pathology and immunology - Internal medicine	6 6	12
<b>II semester</b>		
Genetic and molecular bases of diseases - Biology - Medical genetics	8 6	14
Human biochemistry		9
Molecular biology applied to biotechnology		7
Elective activity		4

II year

(to be made available as of academic year 2025/2026)

COMPULSORY LEARNING ACTIVITIES COMMON TO ALL CURRICULA	ECTS PARTIAL	ECTS TOTAL
Further learning activities (linguistic, informatic, relational)		3
Professionalising training activities		4
Social aspects of biotechnology - History of medicine - Bio-medicine	6 5	11
Elective activity		4
Degree program final exam		21

## Curriculum: Neuroscience

I year

CURRICULUM SPECIFIC ACTIVITIES	ECTS PARTIAL	ECTS TOTAL
Molecular diagnostics and therapy - Radiology - Neurology - Pharmacology - Applied Biology	1 2 2 1	6
Neurobiology - Neurology - Biochemistry - Applied Biology - Physiology	1 1 1 3	6
Pathogenic bases of neurological and psychiatric disorders - Molecular biology - Endocrinology - Mental health - Neurology	1 1 2 2	6

## Curriculum: Medical and experimental oncology

I year

CURRICULUM SPECIFIC ACTIVITIES	ECTS PARTIAL	ECTS TOTAL
Cancer epidemiology and pathogenesis - Medical statistics - General pathology and immunology - Medical oncology - Blood diseases	1 2 1 2	6
Cancer immunology and microenvironment (ONC) - General pathology and immunology - Medical oncology - Blood diseases	2 2 2	6
Research and development of new diagnostic and therapeutic methodologies - Pathology - Applied medical sciences - Blood diseases - Molecular biology	1 1 2 2	6

## Curriculum: Molecular diagnostics for personalised medicine

1 year

CURRICULUM SPECIFIC ACTIVITIES	ECTS PARTIAL	ECTS TOTAL
Advanced techniques in medical biotechnologies - Molecular biology - Obstetrics and gynecology - Biology - Biochemistry	1 1 2 2	6
Data and laboratory management - Medical statistics - Laboratory medicine - Clinical pathology - Forensic medicine	1 1 2 2	6
Molecular diagnostics - Clinical biochemistry - Human genetics - Microbiology	2 2 2	6

## Curriculum: Experimental immunology and transplantations

1 year

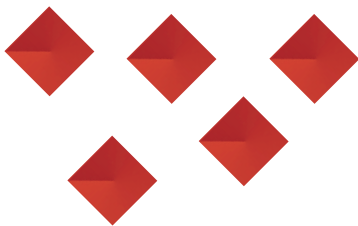
CURRICULUM SPECIFIC ACTIVITIES	ECTS PARTIAL	ECTS TOTAL
Cancer immunology and microenvironment (IMM) - General pathology and immunology - Medical oncology - Blood diseases	2 2 2	6
Experimental immunology and immunobiotechnology - General pathology and immunology - Rheumatology - Laboratory medicine - Domestic animal infectious diseases	1 1 2 2	6
Transplantation and tissue engineering - Forensic medicine - Industrial bioengineering - Blood diseases - General surgery	1 1 1 3	6


## Curriculum: Advanced computation for human disease modelling

1 year

CURRICULUM SPECIFIC ACTIVITIES	ECTS PARTIAL	ECTS TOTAL
In vitro and vivo model system for human diseases modeling - Molecular biology - Applied biology - Pharmacology - Experimental medicine and pathophysiology	1 1 1 3	6
Multilevel computational modelling of human diseases - Molecular biology - Physical chemistry - Applied physics	3 2 1	6
Spatial and molecular organization of cells in diseases - Physiology - Biochemistry - Molecular biology - Applied physics	1 1 3 1	6

# INFO



 **Disciplinary classification:** Pharmaceutical, veterinary and medical biotechnologies (LM-9)

 **Duration:** 2 years (120 ects)

 **Attendance:** Compulsory

 **Curricula:**

- Neuroscience
- Medical and experimental oncology
- Molecular diagnostics for personalized medicine
- Experimental immunology and transplantations
- Advanced computation for human disease modelling

 **Location:**

*Common learning activities*

- Dipartimento di Biotecnologie Mediche e Medicina Traslazionale - via Vanvitelli, 32 - Milano

*Curricular learning activities*

- Dipartimento di Biotecnologie Mediche e Medicina Traslazionale - via Fratelli Cervi, 93 - Segrate (MI)

 **For information:**

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 **Websites:**

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www.unimi.it



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For other information: [www.unimi.it/en](http://www.unimi.it/en) - Education