UNIVERSITA' DEGLI STUDI DI MILANO
PROGRAMME DESCRIPTION - ACADEMIC YEAR 2025/26
MASTER DEGREE
MEDICAL BIOTECHOLOGY AND MOLECULAR MEDICINE (Classe LM-9 R)
Enrolled in 2025/26 Academic Year

HEADING

Degree classification - Denomination and code:	LM-9 R
Degree title:	Dottore Magistrale
Curricula currently available:	NEUROSCIENCE / MEDICAL AND EXPERIMENTAL ONCOLOGY / MOLECULAR DIAGNOSTICS FOR PERSONALIZED MEDICINE / EXPERIMENTAL IMMUNOLOGY AND TRANSPLANTATIONS / ADVANCED COMPUTATION FOR HUMAN DISEASE MODELLING
Length of course:	2 years
Credits required for admission:	180
Total number of credits required to complete programme:	120
Years of course currently available:	1st
Access procedures:	Cap on student, student selection based on entrance test
Course code:	DBB

PERSONS/ROLES

Head of Study Programme

prof.ssa Maura Francolini

Tutors - Faculty

Academic guidance tutor
prof. Marco Venturin

Internship tutor
prof. Diego Fornasari
prof.ssa Anna Marozzi

Erasmus and international mobility tutor
prof.ssa Federica Compostella

Degree Course website

https://medicalbiotechnology.cdl.unimi.it/en

Dip. Biotecnologie Mediche e Medicina Traslazionale sede di via Vanvitelli, 32 Phone 0250317123

http://medicalbiotechnology.cdl.unimi.it/en Email: lsbiotecmed@unimi.it

CHARACTERISTICS OF DEGREE PROGRAMME

General and specific learning objectives

The Master's program in Medical Biotechnology and Molecular Medicine aims to train professionals with a solid technical and theoretical background. Their expected career development will be to develop scientific methodologies and coordinate research projects in the fields of applied biotechnology and translational medicine. The Master's program will provide students with a solid background in the genetic and molecular bases of diseases and the physiopathological mechanisms occurring in human beings in disease states, in order to develop biotechnology-based diagnostic and therapeutic strategies. This knowledge will be complemented with specific training in the fields of computer science, biophysics, nanotechnology and pharmacology. The Master's program is organised in common and curricular learning activities focusing on neuroscience, oncology, molecular diagnostics, immunobiotechnology, modelling and bioinformatics. As part of the common course, students will learn the economic management of a scientific project, with a focus on the construction of a business plan and cost analysis. The Master's program devotes a long period of time, almost the entire second year, to laboratory activities in which the student, under the supervision of a tutor, will independently develop and apply different experimental approaches in the context of a larger research project. This activity will be aimed at preparing for the final examination of the degree course.

Expected learning outcomes

The Medical Biotechnology and Molecular Medicine graduate will be able, in her/his future career, to coordinate and run research projects in the field of biotechnology and molecular medicine and to collaborate with physicians in the development of novel and innovative diagnostic and therapeutic strategies.

Professional profile and employment opportunities

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. All these possibilities arise from the competences of the Master's graduate who will have a strong translational educational background that will allow her/him to represent a fruitful interface with the clinics, building a bridge between the bench and the bedside. A deep knowledge of the pathogenetic mechanisms of diseases is required in order to apply basic disciplines to the management of medical problems.
Employment opportunities: public and private research structures, including Universities, CNR (National Research Council), Istituto Superiore di Sanità (National Institute for health); hospitals; private pharmaceutical, diagnostic and biotechnological companies; companies supporting scientific research (instruments, biotechnological reagents); companies involved in science communication and publishing.
Below a list of professional profiles:

Medical Science Liaison (MSL) within pharmaceutical and biotechnological companies
In the pharmaceutical and biotechnological companies, this new professional figure has the role of establishing scientific relationships with clinicians, supporting the appropriate use of the drugs of interest for the company. This professional has a strong medical and pharmacological background that enable her/him to talk with physicians in order to solve clinical problems related to the use of specific drugs.

Clinical Monitor within pharmaceutical and biotechnological companies; CRO (Clinical Research Organization) (upon completion of a specific training course)
Thanks to the strong background in pharmacology and statistics this expert will be able to coordinate clinical studies. Market Access Manager within pharmaceutical and biotechnological companies; consulting agencies, AIFA (Italian agency for drugs) (upon completion of a specific training course)
Thanks to the strong background in economy and pharmacology, and a knowledge of ethical issues related to commercialization of drugs, the graduate will be in the ideal position to establish stable relationships with the Regulatory Authorities and, in general, with the Institutions with the aim of promoting the approval and the access to the market of new pharmacological and biotechnological products.

Medical and scientific communication advisor within scientific and medical communication agencies and publishers Thanks to the multidisciplinary approaches to medical sciences acquired during the course, the Master Program graduate may evolve into a medical writer or a consultant for the development of distance learning modules for the Continuing Medical Education (CME) or other health professionals requiring continuing education or again as an advisor for pharmaceutical and biotechnological companies in the communication with patient organizations.

Research scientist, after having been enrolled in PhD programs, second level Master degrees, Specialization School in Medical Genetics, Medical Pharmacology, Clinical Biochemistry, Microbiology and Virology, Nutrition. After the State Board Examination, the graduates can enter into the Professional Register of Biologists (Senior Section).

Initial knowledge required

Enrollment to this Master Course is restricted to a limited number of students, in fact access to the program is capped locally. Italian and European students admitted to the Master Program are identified by a ranking list based on the scores of the admission test. This ranking list will be also used for the choice of the curriculum. To be eligible for enrolment and included in the ranking list, a minimum score of 20/50 obtained in the admission test is required. See below for extra European students* The date of the entrance test will be communicated later in the announcement of selection published on the website of UNIMI.

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 curriculum and on an interview evaluation.

B2 entrance level:
Proficiency in English at a B2 level or higher per the Common European Framework of Reference for Languages (CEFR) is required for admission.
The B2-level requirement will be ascertained by the University Language Centre (SLAM) upon admission as follows:
- Language certificate of B2 or higher level issued no more than three years before the date of admission application. You will find the list of language certificates recognized by the University at: https://www.unimi.it/en/node/39322. The

certificate must be uploaded when submitting the online application;
- English level achieved during a University of Milan degree programme and certified by the University Language Centre (SLAM) no more than four years before the date of admission application, including levels based on language certificates submitted by the applicant during their Bachelor's degree at the University of Milan. In this case the process is automatic, the applicant does not have to attach any certificates to the application;
- Entry test administrated by the University Language Centre (SLAM) according to the calendar published on the website: (https://www.unimi.it/en/node/39267/)
All those who fail to submit a valid certificate or do not meet the required proficiency level will be instructed during the admission procedure to take the Entry test.
Applicants who do not take or pass the Entry test will be required to obtain a language proficiency certificate recognized by the University (see https://www.unimi.it/en/node/39322) and deliver it to the SLAM via the InformaStudenti service by the deadline fixed for the master's programme (https://www.unimi.it/en/node/39267/).
Applicants who do not meet the requirement by said deadline will not be admitted to the master's degree programme and may not sit any further tests.

Compulsory attendance

The student is required to attend all the teaching activities, with a tolerance of no more than 25% of the hours.
Students are required to sign their attendance at each learning activities. Should the number of absences be higher than 25%, the Teaching Committee will take the necessary measures.

Internship criteria

During the internship, the students will be directly in charge for the development of a defined research project, with the aim of generating experimental data that will be used for the preparation of the degree program final exam. The laboratory activities are related to the subjects and topic dealt during the course, they are compulsory and they will be certified by the tutor and by a committee.

Degree programme final exams

The final exam consists of: written text, oral presentation and defence of an experimental thesis containing the data obtained by the student during her/his attendance to the research lab. The thesis will be elaborated under the supervision of a professor belonging to the Master Program in Medical Biotechnology and Molecular Medicine with the collaboration of a tutor. The committee will take in consideration the quality of the thesis, the quality of the public presentation and the scientific maturity of the candidate during the discussion.

Campus

The common learning activities will be held at the Dipartimento di Biotecnologie Mediche e Medicina Traslazionale - Via Fratelli Cervi, 93 - 20054 Segrate.
Curricular learning activities will be held at Dipartimento di Biotecnologie Mediche e Medicina Traslazionale - Via Vanvitelli, 32 10129 Milano e Via F.lli Cervi, 93 - 20054 Segrate.

MASTER PROGRAMMES ADMISSION

Admittance from other degree courses

To be admitted to the entrance test, candidates from Italian and EU universities have to possess 180 ects obtained in the Bachelor's degree. Specifically, 50 ects have to derive from 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 non-EU students resident abroad (applicants for a student visa) the admission to the Master Program will be based on the assessment of the personal and scholastic curriculum and on an interview evaluation. As for italian and EU students, extra-EU applicant' scholastic curriculum has to include at least 50 ects in the scientific fields reported in the list as above. In order to profitably follow the learning activities, the candidate should have a good knowledge of spoken and written English. The B2 level is required and the certification has to be provided at the registration of the admission test.
Students waiting to obtain the Bachelor's Degree, can participate in the admission test "sub iudice". In case of success, they will be accepted only if they will obtain the Bachelor degree by December 31th, also possessing the prerequisite described above.
More details about the selection/admission procedure can be find below in the Admission Criteria paragraph.

EXPERIENCE OF STUDY ABROAD AS PART OF THE TRAINING PROGRAM

The University of Milan supports international mobility by providing its students with the opportunity to spend study and internship periods abroad. It is a unique chance to enrich your educational path in a new exciting environment.

The agreements between University of Milan with over 300 universities from the 27 EU member countries under the European Erasmus+ program allow regularly enrolled students to carry out part of their studies at one of the partner

universities or to undertake internships at companies, training and research centres and other organizations.

Similar international mobility opportunities are provided outside Europe, through agreements with a number of prestigious institutions.

Study and internships abroad

The Master program in Medical Biotechnology and Molecular Medicine supports international mobility with leading international universities, as well as the possibility for students to earn credits through exchange education and training programs with Partner organizations.

Available programs:

-Bilateral agreements in the framework of the Erasmus + program with: University of Leuven (Katolieke Universiteit Leuven, Belgium), Leids Universitair Medish Centrum (LUMC) of the University of Leiden (Netherland) and University of Cantabria (Universidad de Cantabria, Spain).

-Traineeship with: Institute for Research in Biomedicine (IRB – Bellinzona, Switzerland).

In recent years, a growing number of students have developed their professionalism and the European dimension of their training through residence periods abroad. Associated universities represent highly recognized European institutions, featuring reference schools (Master and PhD schools) in biomedical sciences and offer the possibility of carrying out research activities in a wide range of scientific fields covered by the Degree Program. The students will thus be offered exciting opportunities to enhance their CVs and evaluate their interests in extending their careers in the international setting. The Master course in Medical Biotechnology and Molecular Medicine offers second year students the possibility to carry out the entire practical training for the preparation of their final thesis work in one of the aforementioned institutions or with other institutions with which an agreement has been established. The student will have to define a research project related to his/her course of studies and curricular training, with the joint agreement of both the Unimi and the foreign tutors. The period abroad amounts to 9 months equivalent to 32 credits. A positive evaluation of the period abroad is required. The latter should be defined by the tutor in the foreign university, the Unimi tutor and is subjected to the approval by the Unimi Didactic Council. Erasmus students who obtain outstanding results, proved by an official evaluation letter of the foreign tutor to the President of the Masters Commission, will be rewarded with 1-2 additional points in the final Laurea Grade. Besides general informative meetings organized by the University, the Degree course in Medical Biotechnology provides specific support to interested/selected students through the organization of specific informative session and/or meeting with the tutor for mobility.

How to participate in Erasmus mobility programs

The students of the University of Milan can participate in mobility programs, through a public selection procedure.

Ad hoc commissions will evaluate:

•Academic career
•the candidate's proposed study program abroad
•his/her foreign language proficiency
•the reasons behind his/her application

Call for applications and informative meetings

The public selection for Erasmus+ mobility for study generally begins around February each year with the publication of a call for applications specifying destinations and requirements. Regarding the Erasmus+ Mobility for Traineeship, the University of Milan usually publishes two calls a year enabling students to choose a destination defined by an inter-institutional agreement or to find a traineeship position on their own.

The University organizes informative meetings to illustrate mobility opportunities and rules for participation. Erasmus+ scholarship

The European Union grants the winners of the Erasmus+ program selection a scholarship to contribute to their mobility costs, which may be supplemented by the University funding for disadvantaged students.

Language courses

Students who pass the selections for mobility programs can benefit from intensive foreign language courses offered each year by the University Language Centre (SLAM).

https://www.unimi.it/en/node/8/

Learn more at https://www.unimi.it/en/node/274/ For assistance, please contact:

International Mobility Office Via Santa Sofia 9 (second floor)

Tel. 02 503 13501-12589-13495-13502

Contacts: InformaStudenti; mobility.out@unimi.it Student Desk booking through InformaStudenti

1st COURSE YEAR Core/compulsory courses/activities common to all curricula		
Learning activity	**Ects**	**Sector**
Advanced microscopic techniques and nanotechnology	6	FIS/07
Applied pharmacology to biotechnology	7	BIO/14

Genetic and molecular bases of diseases		14	(6) MED/03, (8) BIO/13
Human biochemistry		9	BIO/10
Molecular biology applied to biotechnology		7	BIO/11
Pathogenetic basis of diseases		12	(2) MED/13, (6) MED/04, (4) MED/09
	Total compulsory credits	55	

Elective courses common to all curricula

2nd COURSE YEAR (available as of academic year 2026/27) Core/compulsory courses/activities common to all curricula

Learning activity		Ects	Sector
Degree program final exam		21	ND
Further learning activities (linguistic, informatic, relational)		3	ND
Professionalizing training activities		4	ND
Social aspects of biotechnology		11	MED/02
	Total compulsory credits	39	

Elective courses common to all curricula

ACTIVE CURRICULA LIST

NEUROSCIENCE Course years currently available: 1st
MEDICAL AND EXPERIMENTAL ONCOLOGY Course years currently available: 1st
MOLECULAR DIAGNOSTICS FOR PERSONALIZED MEDICINE Course years currently available: 1st
EXPERIMENTAL IMMUNOLOGY AND TRANSPLANTATIONS Course years currently available: 1st
ADVANCED COMPUTATION FOR HUMAN DISEASE MODELLING Course years currently available: 1st

CURRICULUM: [DBB-A] NEUROSCIENCE

1st COURSE YEAR Core/compulsory courses/activities Curriculum-specific features NEUROSCIENCE

Learning activity		Ects	Sector
Molecular diagnostics and therapy		6	(1) MED/50, (2) MED/26, (2) BIO/14, (1) BIO/13
Neurobiology		6	(1) BIO/10, (3) BIO/09, (1) MED/26, (1) BIO/13
Pathogenetic bases of neurological and psychiatric disorders		6	(1) BIO/11, (1) MED/13, (2) MED/26, (2) MED/25
	Total compulsory credits	18	

CURRICULUM: [DBB-B] MEDICAL AND EXPERIMENTAL ONCOLOGY

1st COURSE YEAR Core/compulsory courses/activities Curriculum-specific features MEDICAL AND EXPERIMENTAL ONCOLOGY

Learning activity		Ects	Sector
Cancer epidemiology and pathogenesis		6	(2) MED/04, (1) MED/01, (2) MED/15, (1) MED/06
Cancer immunology and microenvironment		6	(2) MED/04, (2) MED/15, (2) MED/06
Research and development of new diagnostic and therapeutic methodologies		6	(1) MED/50, (2) BIO/11, (2) MED/15, (1) MED/08
	Total compulsory credits	18	

CURRICULUM: [DBB-C] MOLECULAR DIAGNOSTICS FOR PERSONALIZED MEDICINE

1st COURSE YEAR Core/compulsory courses/activities Curriculum-specific features MOLECULAR DIAGNOSTICS FOR PERSONALIZED MEDICINE

Learning activity		Ects	Sector
Advanced techniques in medical biotechnology		6	(1) BIO/11, (2) BIO/10, (1) MED/40, (2) BIO/13
Data and laboratory management		6	(1) MED/01, (3) MED/46, (2) MED/43
Molecular diagnostics		6	(2) MED/03, (2) MED/07, (2) BIO/12
	Total compulsory credits	18	

CURRICULUM: [DBB-D] EXPERIMENTAL IMMUNOLOGY AND TRANSPLANTATIONS

1st COURSE YEAR Core/compulsory courses/activities Curriculum-specific features EXPERIMENTAL IMMUNOLOGY AND TRANSPLANTATIONS

Learning activity		Ects	Sector
Cancer immunology and microenvironment		6	(2) MED/04, (2) MED/15, (2) MED/06
Experimental immunology and immunobiotechnology		6	(1) MED/04, (2) MED/46, (1) MED/16, (2) VET/05
Transplantation and tissue engineering		6	(1) MED/15, (1) ING-IND/34, (1) MED/43, (3) MED/18
	Total compulsory credits	18	

CURRICULUM: [DBB-E] ADVANCED COMPUTATION FOR HUMAN DISEASE MODELLING

1st COURSE YEAR Core/compulsory courses/activities Curriculum-specific features ADVANCED COMPUTATION FOR HUMAN DISEASE MODELLING

Learning activity		Ects	Sector
In vitro and in vivo model systems for human diseases modeling		6	(1) BIO/11, (3) MED/04, (1) BIO/14, (1) BIO/13
Multilevel computational modelling of human diseases		6	(3) BIO/11, (1) FIS/07, (2) CHIM/02
Spatial and molecular organization of cells in diseases		6	(3) BIO/11, (1) BIO/10, (1) BIO/09, (1) FIS/07
	Total compulsory credits	18	

COURSE PROGRESSION REQUIREMENTS

Before taking any curricular exams, the student must pass the six common exams of the courses, provided in the first two quarters. In order to begin the laboratory activity, the student has to pass the 6 common exams of the first two trimesters.