



# UNIVERSITÀ DEGLI STUDI DI PALERMO

Department: Biological, Chemical and Pharmaceutical Sciences and Technologies

A.Y. 2016/2017

DEGREE COURSE IN MOLECULAR AND HEALTH BIOLOGY

- MOLECULAR BIOLOGY -

## Characteristics



Class of Master's Degree  
(MSc) on Biology (LM-6)



2 YEARS



PALERMO



PLANNED ACCESS



2195

## Educational objectives

Specific objectives:

The degree Course in Molecular and Health Biology completes the training in biological disciplines started with the 1st cycle degree in biological sciences or alike. This degree course aims to produce graduates with advanced preparation, able to respond professionally and scientifically to various biological issues, through the use of modern biomolecular techniques and their interpretation. Students will obtain solid theoretical and practical groundings, thanks to the activity carried out during the experimental thesis period. The Degree Course offers the chance to acquire advanced skills about the cellular, biochemical and physiological processes in prokaryotes and eukaryotes, including humans, about the normal functioning of organisms (prokaryotes and eukaryotes) and the main causes of homeostatic alterations at molecular, cellular and organ level. The aim of the Degree Course is to train graduates who possess a solid background on molecular, genetic and cell techniques, knowing and knowing how to identify the factors that may affect human health. In any case, students will have the opportunity to choose a curriculum specifically related to the cellular and molecular aspects of biology or a curriculum in which they acquire more knowledge about the factors that may affect human health. Graduates will be able to spend the acquired knowledge in the workplace both in basic research laboratories and in the health sector laboratories (environmental, nutritionist, pharmacological). The above knowledge and understanding are achieved by graduates, through lectures with mandatory attendance, exercises, and self-study, provided by the specific educational activities in the following sectors: BIO/O6, BIO/O9, BIO/O10, BIO/O11, BIO/O18. In the second year of the degree course, more than two-thirds of activities are focused at the development of the thesis with the aim to provide students, through a significant experience of experimental work in the laboratory, the opportunity to acquire both cultural tools and critical analysis skills which are necessary not only to carry out research but also for the development of leadership skills. The Degree Course is, in fact, a suitable cultural basis for the continuation of advanced training through PhD programs.

Making judgments:

Graduates:

- are able to critically exercise judgment on social, scientific and ethical issues;
- Possess analysis and synthesis ability for the management and dissemination of experimental data in the scientific field;
- are able to solve in autonomy theoretical and experimental problems in the health biological field.

Judgement skills are developed in particular through the internship and the activities assigned by the supervising professor in preparation of the final examination. The acquisition of judgment skills is assessed through the evaluation of the degree of autonomy and ability to work, even in groups during the activities assigned in preparation of the internship and the final examination.

Communication skills:

Graduates:

- Possess relational and communication skills which enable them to present scientific arguments orally or in writing to an informed audience.
- are able to use effectively in written and oral form, the English language in the professional field;
- are able to work in a team, particularly in the context of laboratory activities.

Written and oral communication skills are developed in particular during seminars or preparation of reports and presentations. The acquisition of communication skills is also assessed through the preparation of the thesis and its discussion on the occasion of the performance of the internship.

Learning ability:

Graduates:

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- possess learning methods that are needed to undertake future studies with a sufficient degree of autonomy;
- are able to deepen knowledge by resorting to their culture and/or to scientific sources.

Learning skills are acquired throughout the study period, in particular during individual study, during the preparation of individual projects and during the activities for the preparation of the thesis.

The learning skills will be assessed through continuous monitoring during educational activities and through the evaluation of the ability to meet deadlines, as well through the assessment of the self-learning skills developed during the preparation of the final examination.

### **Professional opportunities**

Profile:

Biologist

Functions:

Biologist able to exercise its competence in the fields of industry, health and public administration as well as in private laboratories.

Skills:

Understanding of normal and abnormal biological processes and skills in analytical methods.

The acquired skills may be used in: companies and public and private laboratories in the field of the control of and/or industrial, human activities such as zoo-prophylaxis; agricultural control (for example the control of the spread of infections in cultivated plants); environmental control and hygiene, where molecular/genetic expertise is needed; execution of phylogenetic testing, genetic testing and molecular diagnostics related to various diseases (cancer, viral diseases, etc.), paternity testing, determining the karyotype etc.; food diagnostic testing and identification of GMOs; toxicology tests for the identification of drugs and drug use; use of molecular biomarkers for the monitoring of terrestrial and marine pollution levels; in the Scientific Investigations Departments of Police corps, for situations requiring specialists able to perform DNA analysis on biological samples:

Professional opportunities:

Professional practice, public and private institutions. Basic and specialized diagnostic laboratories, environmental analysis laboratories, pharmaceutical laboratories

Profile:

Nutritionist

functions:

Biologist able to determine optimum diet for the individual, also in relation to ascertained pathophysiological conditions or to identify optimal diets for communities, such as canteens, sports groups, hospitals, nursing homes etc., in relation to the characteristics of the subjects.

Skills:

Knowledge of the biology of nutrition and of the major alterations of metabolism. Ability to assess the human nutritional and energy needs.

Professional opportunities:

Professional practice, public and private institutions.

Profile:

Researcher

Functions:

Researcher in public and private research institutes, capable of identifying or helping to identify particularly original, meaningful and valuable advances in basic or applied research (plant health, environment, biotechnology etc.).

Skills:

Ability to apply the scientific method and to design, collect, interpret and process, even from a statistical point of view, scientific data derived from observations and obtained from laboratory experiments.

Professional opportunities:

research institutes, public and private

Profile:

Science communicator

Functions:

Biologist communicator for information activities with Health and Wellbeing professionals (pharmacies, doctors, naturopaths, osteopaths, herbalists etc.).

Skills:

Dissemination and development of scientific and technological innovation

Professional opportunities:

Private companies

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**Final examination features**

The final examination consists of the preparation of a written dissertation, related to the presentation of original experimental results of a research project or of part of it, obtained during the internship period. The project will be carried out at an university research laboratory or in other public or private research laboratories, under specific agreements with the University. Normally, this internship period takes place during the second course year. However, the Board of the Degree course, having considered the candidate's curriculum, may authorize it during the second semester of the first year. The research project will be developed under the guidance of a professor (full, associate, researcher) responsible for monitoring the research work and the preparation of the student, with the role of tutor. The test will end with the discussion of the project during the graduation session.

Subjects 1 ° year	CFU	Sem.	Val.	SSD	TAF
15559 - BIOCHEMICAL MECHANISMS OF CELLULAR FUNCTIONS <i>Giuliano(PA)</i>	6	1	V	BIO/10	B
05176 - BIOCHEMICAL METHODOLOGIES <i>D'Anneo(PA)</i>	6	1	V	BIO/10	B
01597 - CELL BIOLOGY <i>Geraci(PA)</i>	6	1	V	BIO/06	B
17196 - ELEMENTS OF BIOPHYSICS <i>Cottone(PA)</i>	6	1	V	FIS/07	C
17195 - MOLECULAR PHYSIOLOGY <i>Serio(PO)</i>	6	1	V	BIO/09	B
13351 - ADVANCED SKILLS RELATED TO THE LABOUR MARKET	1	1	G		F
03560 - GENETICS OF MICROORGANISMS <i>Puglia(PQ)</i>	6	2	V	BIO/18	B
16480 - MOLECULAR GENETICS AND GENETIC AND CYTOGENETIC METHODOLOGIES - INTEGRATED COURSE	12	2	V		
- GENETIC AND CYTOGENETIC METHODOLOGIES <i>Di Leonardo(PA)</i>	6	2		BIO/18	C
- MOLECULAR GENETICS <i>Lentini(PA)</i>	6	2		BIO/18	B
13906 - RECOMBINANT TECHNOLOGIES WITH BIOINFORMATICS APPLICATIONS <i>Costa(RU)</i>	6	2	V	BIO/11	B

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Subjects 2 ° year	CFU	Sem.	Val.	SSD	TAF
08308 - FUNCTIONAL GENOMICS <i>Ragusa(RU)</i>	9	1	V	BIO/11	B
07553 - PROFESSIONAL PRACTICE	14	1	G		F
05917 - FINAL EXAMINATION	30	2	G		E
Free subjects	12				D

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