MOLECULAR GENETICS MASTER STUDY PROGRAMME

Molecular Genetics master programme was accredited in Faculty of Biology Alexandru Ioan Cuza University of Iasi, since 1997 – 1998. Molecular Genetics master programme has an extend of 4 semesters (120 credits), according to the Law 288/2004, HG 404/2006, OU 75/2005, OMEC 3617/2005

Establishment of the **Molecular Genetics** master**,** English taught day courses (4 semesters with 120 credits), was approved by the Council of the Faculty of Biology, Alexandru Ioan Cuza University of Iasi, on April 19th 2011 and by Alexandru Ioan Cuza University of Iasi, Senate Decision, No.2/21.04.2011.

Given the increasing development of Biology in the last half of the twentieth century and in the beginning of this millennium towards the study of molecular aspects of life and also due to the wide introduction of biotechnologies in many areas, **Molecular Genetics** covers these requirements through an appropriate curriculum plan.

The curriculum of this two-year study cycle aims to increase the practical application of the acquired theoretical knowledge of the students and for the graduate's preparation of thesis in studies at the molecular level. This university master specialization aims to provide graduates with scientific competencies that will allow them to investigate the molecular mechanisms important for the structure and function of the living cells.

Completing this specialization will allow for:

- Good knowledge of the molecular mechanisms of gene expression;
- Overview of different cellular processes interrelations;
- Ability to understand and analyse molecular biology problems, by acquiring all necessary investigation methods and techniques.

1. MISSION AND OBJECTIVES OF THE STUDY PROGRAMME

Molecular Biology science has evolved from genome analysis at a chromosomal level, through classical and cytogenetic techniques, to highly sensitive genomic analysis, on a large spectrum of organisms, from bacteria and microscopic algae to plants of major economic, ecological, floristic and taxonomic interest, animals of taxonomic and economic interest and humans. Modern techniques of genetic analysis, as PCR and gene sequencing, have become routine methods and as a result, gene mapping through molecular hybridization have already been published.

Molecular Genetics specialization (English taught) objectives:

- Training human resources specialized in Molecular Biology
- Perform multidisciplinary research (Genetics, Biochemistry, Cell Biology, Medicine, Pharmacy) and develop a network consisting of elite research cores, attached to Romanian universities
- Training and development of organizational structures able to cope with managerial problems that arise in the research activity, in the field of Molecular Biology.
- Ensuring the necessary conditions to participate in international research networks and programs, as a current phase of European and global integration of Romanian research in the field of Biochemistry and Molecular Biology.

2. GRADUATES PROFESSIONAL PROFILE

The master in **Molecular Genetics** is based on a curriculum plan that aims for teaching Molecular Biology, Genetics and Biochemistry general and special competencies which will ensure a good labour market insertion of graduates and on the other hand, proper education in order to apply for university PhD studies. These competences are listed below, by category:

Cognitive competences:

- Knowledge, understanding and use of biochemistry specific concepts, theories, principles and laws;
- Explaining and interpreting processes, phenomena, states and evolutionary tendencies at a biological system level;

- Oral and written communication using the correct terminology specific to Biology.

Technical competences:

- Developing exploration/investigation capacities of biological system's functions and their relation with the environment;
- Collection, analysis and interpretation of quantitative and qualitative data regarding specific problems of the living;
- Capacity to work independently or as part of a team, towards resolving problems in a professional context;
- Use and construction of models and algorithms towards proving the principles of the living world;
- Transfer and integrate knowledge and biology specific methods into new contexts;
- Achieving intra-, inter- and trans disciplinary connections in the process of analysing phenomena and processes specific to the living world;
- Instrumenting, creative application of teaching-learning-evaluating methods, techniques, proceedings and didactic principles in order to develop the capacity to think and act as biochemists or molecular biologist.

General competences:

- Interest in scientific information and documentation;
- Cultivating curiosity and respect towards any life form;
- Care towards oneself, others and the environment;
- Developing tolerance towards other people's opinions;
- Receptivity and flexibility in applying genetic knowledge;
- Awareness and involvement in problems of global interest.

Specialty competences:

- Knowing and understanding the organization and functions of genetic material in the living world;
- Applying laboratory methods and techniques to study nucleic acids and proteins;
- Using different methods and criteria to evaluate the structures and functions of the genetic material in biological systems;
- Study of molecular markers used in the genetic characterization of plant and animal species;
- Knowledge of principles and methods for identifying genetic diversity and evolutionary processes of the living world;
- Study of biomarkers used in human disease diagnostics.

Graduates of the English taught Molecular Genetics master will be able to apply for a wide range of key positions, executive or decisional, in the field of fundamental or applicative research. Graduates will have diversified knowledge of molecular biology and they will develop the skills to understand and analyse complex interrelations that govern the structure and functioning of the living cell.

3. FACILITIES

The Faculty of Biology disposes of adequate facilities for all the research and teaching activities included in this study program (Biology master, **Molecular Genetics** specialization, taught in English):

- CLASSROOMS: B2 Amphitheatre (200 seats); room B-339 (50 seats).
- COMPUTER NETWORK - room B - 435 (45 m^2)
- BIOLOGY FACULTY LIBRARY
- ROOMS FOR LABORATORY PRACTICAL WORK AND SEMINARIES
- RESEARCH LABORATORIES
- EQUIPMENTS: fully equipped laboratory for a wide range of molecular analysis including DNA sequencing (CEQ 8000 Genetic analyser) and gene expression (Rotor Q 6000 5 plex and HRM RT-PCR system)

4. CURRICULA

1st year curricula

Nr. crt.	Topic	Credits
1	Biochemistry of informational macromolecules	6
2	Recombinant DNA technologies	6
3	Statistical methods in bioinformatics	6
4	Transgenic plants	6
5	Control of Gene Expression	6
TOTAL		**30**
1	Ethical aspects in GMO research and utilisation	6
5	Proteome	6
3	Human molecular genetics	6
4	Biomodelling: genetics algorithms	6
5	Transgenic animals	6
TOTAL		**30**

2nd year curricula

Nr. crt.	Denumirea disciplinei	Credits
1	Microbial Biotechnology	7
2	Molecular Biotchnologies in Medicine and Industry	7
3	Molecular neurobiology	8
4	Molecular Mechanisms of Cell Signalling	8
TOTAL		**30**
1	Pharmacogenomics and immunogenetics	7
2	Molecular alterations involved in genomic	7

	instability	
3	Molecular Phylogenetics and Phylogeography	8
4	Molecular Biology of Cell Cycle	8
5	3 weeks research practice	
TOTAL		**30**

5. ADMISSION

Study in Romania!

http://www.uaic.ro/en/international/international-students/full-degree-students/

If you consider becoming a FULL-DEGREE student at Alexandru Ioan Cuza University of Iasi, please read the following information:

METHODOLOGY for admission of international students to undergraduate and postgraduate studies in the academic year 2014-2015:

http://www.uaic.ro/wp-content/uploads/2014/01/Admission-of-international-students-2014-2015.pdf

REGISTRATION PROCEDURE FOR EU CITIZENS

http://cnred.edu.ro/en/#recognition-of-studies-for-admission-to-university-in-Romania

IMPORTANT! Applicants shall send their degree assessment files directly to our Department of International Relations by 2 June 2014 at the latest for the summer admission session to take place between 16 – 25 July 2014

and by 31 July 2014 at the latest for the autumn admission session to take place between 8 – 10 September 2014. The latter deadline is also valid for the admission to doctoral programmes.

Since the procedure at CNRED can take up to 30 days, we strongly advise you to send your file by the deadlines mentioned above. Files submitted at a later date may not be processed in due time.

http://www.uaic.ro/wp-content/uploads/2014/01/registrationofEUcitizens.pdf

APPLICATION FORM FOR ACADEMIC RECOGNITION - EU CITIZENS

http://www.uaic.ro/wp-content/uploads/2014/01/formularcetateniUE.pdf

REGISTRATION PROCEDURE FOR NON-EU CITIZENS WHO CONSIDER STUDYING AT ALEXANDRU IOAN CUZA UNIVERSITY OF IASI

IMPORTANT! in accordance with the letter no. 33387 issued by the Ministry of National Education on 12 May 2014, the lists with proposed candidates should reach the Ministry's registration desk by 1 August 2014. Therefore, candidates are kindly required to send their files no later than mid-July. Files submitted at a later date may not be processed in due time.

http://www.uaic.ro/wp-content/uploads/2014/01/Registration-Procedure-for-Non-EU-Citizens-who-consider-studying-at-Alexandru-Ioan-Cuza-University-of-Iasi.pdf

APPLICATION FORM FOR ISSUANCE OF LETTER OF ACCEPTANCE - NON-EU CITIZENS

http://www.uaic.ro/wp-content/uploads/2014/01/ApplicationfortheIssuanceoftheLetterofAcceptancetoStudies-1.pdf

VERY IMPORTANT: Incomplete files (not complying with regulations, not specifying full contact details or lacking proof of processing fee payment) will not be taken into consideration.

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