

Mediterranean Agronomic Institute of Chania

B. Centre of Applied Agrobiological and Food Sciences

B1. Horticultural Genetics and Biotechnology

Objectives

The long course on Horticultural Genetics & Biotechnology provides a two-year Master of Science degree programme for scientists holding a university Bachelors degree in agronomy, biology, horticulture, agricultural engineering, chemistry, plant science or any related field. The major goals of the Department of Horticultural Genetics and Biotechnology are to provide the students with a thorough grounding in the mechanisms, capabilities, uses and limitations of plant biotechnological methods so that they will be able to apply them to problems related to horticultural production and quality.

The first year students receive a solid theoretical background and practical training, leading to the attainment of a PGD certificate, attending classes and extensive laboratory courses in the following fields: (i) Applied plant molecular genetics and biotechnology including the hormonal and developmental regulation of gene expression, in vitro and tissue culture techniques, and transformation strategies; (ii) Applied plant genetics including marker-assisted breeding, risk assessment for Genetically Modified Organisms, Genetically Modified Organism certification protocols and Arabidopsis genetics. Emphasis throughout the course is placed on horticultural crops and their products.

In the second year, students who have successfully completed the first year will develop advanced molecular biology technical skills and independent thinking by working on research projects in modern, well-equipped laboratories leading to a Master's of Science degree.

1. Training sequence

Section 1 - Introductory Discipline [11/10/2004-29/10/2004]

Unit 1 - English	M. Verivaki, MAICh
Unit 2 - Computer	N. Boretos, MAICh
Unit 3 - Introduction to Statistics	Prof. A. Kanas Univ. of Crete, Rethymno –Greece

Section 2 - Introduction to Advanced Biology [01/11/2004-24/12/2004]

Unit 1 - Cell Biology	Ass Prof. C. Vlachonasis Aristotle Univ. of Thessaloniki – Greece
Unit 2 - Biochemistry	Dr. C. Sekeris, National Research Institute, Athens, Greece
Unit 3 Stress Physiology	Dr. T. Awada, University of Nebraska, USA

Unit 4 - Genetics

Prof. A. Tsaftaris,
Aristotle Univ. of Thessaloniki –
Greece

Unit 5 - Molecular Biology

Dr. D. Kafetzopoulos,
Institute of Molecular Biology,
Heraklion-Greece

Section 3 - In-Vitro Production Techniques [10/01/2005 – 04/02/2005]

Unit 1 - Molecular Biology Techniques [Lab]

Dr. P. Kalaitzis,
MAICh, Greece

Unit 2- *In-Vitro* Techniques for Applied Biotechnology

Prof. E. Rugini,
University of Tuscia, Italy

Unit 3- Tissue Culture and In-Vitro Techniques Laboratory [Lab]

Mr. N. Leventakis, Mrs. K.
Grigoriadou
Mr. Chr. Dovas,
In Vitro Hellas, Greece

Section 4 - Applied Genetics [07/02/2005 – 01/04/2005]

Unit 1 - Molecular Breeding of Horticultural Crops

Dr. J. Garcia, Dr. A. Verus,
IRTA, Spain

Unit 2 - Genetic Improvement and Seed Production

Prof. N. Fanourakis,
TEI Heraklion, Greece

Unit 3 - DNA Fingerprinting Technology [Lab]

Dr. G. Kotoulas, Dr. K.
Tsingenopoulos,
ITHAVIK, Heraklion, Greece

Unit 4 - Arabidopsis Genetics

Ass. Prof. C. Vlachonasios,
Aristotle University of Thessaloniki,
Greece

Unit 5 - Mutagenesis & Mutant Analysis of Arabidopsis Thaliana

Dr. K. Kalantidis,
Institute of Molecular Biology,
Heraklion, Greece

Unit 6 - Agro-Mediated Transformation of Arabidopsis Thaliana [Lab Course]

Prof. P. Chatzopoulos,
Agricultural University of Athens,
Greece

Section 5 - Post-Harvest Biotechnology [04/04/2005 - 17/06/2005]

Unit 1 - Molecular Biology and Biochemistry of Fruit Ripening

Prof. G. Casadoro,
University of Padova, Italy

Unit 2 - Biotechnology of the Plant Hormone Ethylene

Dr. J. Pech,
ENSAT, Tolosan, France

Unit 3 - Post-Harvest Biotechnology / Nutritional Genomics

Prof. A. Kanellis,
Aristotle University of Thessaloniki,
Greece

Unit 4 - CA Storage and Molecular Basis of Hypoxia

Dr. P. Kalaitzis,
MAICH - Greece

Unit 5 - Alternative Post-harvest Methodology and Quality Attributes

Prof. G. Nanos,
University of Thessaly-Greece
Prof. D. Gerasopoulos,
Aristotle University of Thessaloniki,
Greece

Unit 6- Detection of GM-Horticultural Crops [Lab]

Dr. O. Koutita,
Hellenic Sugar Industry, Greece

Unit 7 - Ecological Risk Assessment of Genetically Modified Crops

Prof. M. Wilkinson,
University of Reading, UK