



United Nations Educational, Scientific and Cultural Organization  
Organisation des Nations Unies pour l'Éducation, la Science et la Culture

# ICRO INTERNATIONAL CELL RESEARCH ORGANIZATION

## ORGANISATION INTERNATIONALE DE RECHERCHE SUR LA CELLULE

### **Practical and Theoretical course on Plant Functional Genomics and Molecular Genetics**

**Santiago, Chile**  
**January 10 – 21, 2005**

#### Course Objectives

To teach young scientists the advances in plant genomics and molecular genetics in the post-genomic era and provide them with training and tools that will enable them to determine gene function at the molecular and cellular levels. Participants will learn how to study and analyze genomes, transcriptomes and proteomes in model plants as well as genetic and reverse genetic strategies to study gene function and cellular organization.

#### Sponsors

International Cell Research Organization (ICRO-UNESCO)  
International Centre for Genetic Engineering and Biotechnology (ICGEB)  
Facultad de Ciencias, Universidad de Chile  
Facultad de Ciencias Biológicas, P. Universidad Católica de Chile  
Red Genoma Vegetal, Chile  
Plant Cell Biology Millenium Nucleus, Chile  
Iniciativa Científica Milenio  
Fondo de Innovación Agraria  
Fundación Ciencia para la Vida

#### National Organizers

Dr. Ariel Orellana (Faculty of Sciences, Universidad de Chile, Chile)  
Dra. Loreto Holuigue (Faculty of Biological Sciences, P. Universidad Católica de Chile)

#### Invited Speakers

Nam-Hai Chua, Laboratory of Plant Molecular Biology, The Rockefeller University, USA  
Paul Dupree, Department of Biochemistry, University of Cambridge, UK  
Katrina Ramonell, Department of Biological Sciences, The University of Alabama, USA  
Raimundo Villarroel, Department of Molecular Genetics, University of Gent - Belgium

#### National Faculty

Patricio Arce, Depto. Genética Molecular y Microbiología, Fac. de Ciencias Biológicas, Pontificia Universidad Católica de Chile  
Loreto Holuigue, Depto. Genética Molecular y Microbiología, Fac. de Ciencias Biológicas, Pontificia Universidad Católica de Chile  
Xavier Jordana, Depto. Genética Molecular y Microbiología, Fac. de Ciencias Biológicas, Pontificia Universidad Católica de Chile  
Lee Meisel, Núcleo Milenio en Biología Celular Vegetal, Departamento de Biología, Facultad de Ciencias, Universidad de Chile.  
Ariel Orellana, Núcleo Milenio en Biología Celular Vegetal, Departamento de Biología, Facultad de Ciencias, Universidad de Chile  
Herman Silva, Núcleo Milenio en Biología Celular Vegetal, Departamento de Biología, Facultad de Ciencias, Universidad de Chile

#### Specific Course Topics

- 1.- Approaches to analyze changes in gene expression:
  - 1.1.- Microarray. Analysis of data available in databases
  - 1.2.- cDNA-AFLP
  - 1.3.- Real Time PCR (depending on the availability of the equipment)
- 2.- Functional analysis of new discovered genes
  - 2.1.- Reverse genetics approaches in *Arabidopsis thaliana*

2.2.- Subcellular localization using Green Fluorescent Protein tagged genes and confocal microscopy

2.3.- Use of RNAi

3.- Bioinformatics

4.- Proteomics

The course will be divided in two parts. The first will be a series of lectures given by the invited speakers and the national faculty. The second part, will be a practical course consisting of a series of experiments that will be developed by the students.

#### Lecture Topics

Paul Dupree:	Proteomes of Organelles
Katrina Ramonell:	Transcriptome analysis of the Plant-Microbe interaction using microarray technology
Raimundo Villarroel:	Approaches towards defining gene function based on gene silencing using RNAi and analyzing differential gene expression using AFLP analyses.
Nam-Hai Chua:	To be announced
Patricio Arce:	Approaches towards defining gene function by using viral expression systems
Loreto Holuigue:	Gene expression in stress defense response
Xavier Jordana:	Gene expression and mitochondrial biogenesis
Lee Meisel:	Strategies towards understanding cell polarity and protein targeting in plant cells.
Ariel Orellana:	A reverse genetic approach to study Nucleotide Sugar Transporters
Herman Silva:	Bioinformatics in the post-genomic era.

#### Practical Course

- 1.- Bioinformatics in the post-genomic era (under the guidance of Herman Silva and Lee Meisel)
- 2.- The use of AFLP to study gene expression (under the guidance of Raimundo Villarroel and Loreto Holuigue)
- 3.- Microarray Analysis and Data interpretation (under the guidance of Katrina Ramonell and Patricio Arce).
- 4.- Real-time PCR, quantitative analysis of gene expression at a micro level.
- 5.- Reverse Genetic Approach towards defining gene function (Xavier Jordana and Ariel Orellana)
- 6.- Proteomics (under the guidance of Paul Dupree and Ariel Orellana)
- 7.- Protein targeting - Methods to determine Protein localization in planta (under the guidance of Lee Meisel)

#### Participants

Participation will be limited to 14 students for the practical course.

Lectures will be open to all interested persons that register (no charge). A letter including name, complete address (including fax or email), institution and country will be sufficient to register.

#### Applications

The applicants have to send a letter via email to [genoma@uchile.cl](mailto:genoma@uchile.cl). The letter must include:

- 1) CV with list of publications;
- 2) Two letters of recommendation from scientists acquainted with the student's work;
- 3) A brief letter from the applicant explaining reasons for participating in the course and highlighting in particular how topics covered in the experimental part relate to his/her present or future research.
- 4) A letter from the Lab director or any kind of official document confirming the applicant ability to understand and speak English.

All applications and registrations should be submitted online at

<http://www.genomavegetal.cl/curso2005> Deadline for applications is November 30th

Any question should be addressed to:

Dr. Ariel Orellana  
Department of Biology  
Faculty of Sciences  
University of Chile  
Fax: (56-2) 2712983  
Email: [genoma@uchile.cl](mailto:genoma@uchile.cl) or [aorellan@uchile.cl](mailto:aorellan@uchile.cl)

#### Scholarships

Some scholarships to attend to the course will be available. They will cover accommodation and meals in Santiago. Some funds will be also available to cover travel expenses, however, request for support from the home institution is highly encouraged.