

**CURSO INTENSIVO DE POSGRADO
INTENSIVE POSGRADUATE COURSE**

**GENOMICA FUNCIONAL EN LEGUMINOSAS
FUNCTIONAL GENOMICS IN LEGUMES**

November 16-27, 2009

Instituto de Biotecnología y Biología Molecular (IBBM), Universidad Nacional de La Plata-CONICET, Calle 115 entre 49 y 50, La Plata, Argentina

Sponsored by CABBIO, Centro Argentino Brasileiro de Biotecnología

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Objetivos/Objectives

Con un enfoque crítico, proveer información actualizada sobre el uso de herramientas basadas en la genómica de leguminosas para su aplicación en el avance del conocimiento en la región, y en la solución de problemas y limitaciones de la agricultura en su forma más amplia y comprensiva.

Temáticamente, el curso abordará aspectos de la genómica funcional considerándola un método científico que busca identificar y definir la función de los genes y descubrir cuándo y cómo trabajan juntos los genes para producir caracteres. En especial, se desarrollarán los resultados de investigaciones recientes sobre la identificación de factores genéticos de leguminosas participantes en el proceso de interacción simbiótica con rizobios, la identificación de mecanismos nuevos de regulación basado en miRNAs, y la transformación génica de leguminosas.

Temas/Topics

- Legumes, their significance as cropping and model plants for basic research on symbiosis with rhizobia
- Transcriptional factor in legumes. Structure, families. General and specific functions. Transduction pathways. Approaches to determine functions.
- Genetic transformation of leguminous plants
- Heterologous gene expression and silencing in leguminous species
- Composite plants by using *Agrobacterium rhizogenes*; reporter genes, and RNAi strategies to investigate symbiotic functions.
- Evolution of symbiotic signaling in Legumes. Perception of rhizobial Nodulation (Nod) factors and subsequent induction of symbiotic responses is a unique legume feature. Signal transduction.
- Hypotheses on the evolution of symbiotic signaling and the methodologies used to test them.

- Actinorhizal genomics : the establishment of ESTs collections and microarrays for two actinorhizal trees ; *Casuarina* and *Alnus* and the comparative analysis of root, nodule and mycorrhizal transcriptomes. Recent findings on *Frankia* genomics including the sequencing of several *Frankia* genomes and the analysis of the *Frankia* transcriptome RNAi and complementation strategies that unveiled common genetic mechanisms shared by rhizobial, actinorhizal and mycorrhizal symbiosis
- Regulation of root architecture and symbiosis in legumes: comparison of lateral root development and nodule development. Impact of abiotic stresses on root growth in legumes, functional analysis of transcriptome results, transcription factors and receptor kinases.
- Regulatory RNAs and the control of developmental plasticity (non-coding RNAs in development and stress responses, small RNAs, silencing and RNAi, deep sequencing of small RNAs). Analysis of small RNA diversity in Legumes, the dynamic transcriptome interactions between transcription factors and miRNAs.

Students will be asked to present a seminar on their research project during the first week of the course. Literature seminars on selected papers will be prepared and presented by groups of students during the second week of the course.

Profesores/Lecturers

IBBM

Aguilar, O. Mario
Battaglia, Marina
Blanco, Flavio A.
Zanetti, María Eugenia

Invited Lecturers

Aragao, Francisco, EMBRAPA-Brasilia, Brazil
Borsini, Julio Omar, Universidad de la República, Montevideo, Uruguay
Chan, Raquel, Universidad del Litoral, Argentina
Crespi, Martin, CNRS, Gif sur Yvette, France
Geurts, Renè, Wageningen University, Netherlands
Svistoonoff, Sergio, IRD, Montpellier, France