



Area of Impact: Agricultural Production
Speciality: Plants & Fungi

In a global world, efficiency in food production and food safety are key for conceiving sustainable development. And, even though Chile has a strong economy based on agriculture, paradoxically it has not devoted systematic efforts in advancing plant and fungal sciences to face these challenges.

Understanding how plants and fungi perceive the environment allows conceiving effective plant nutrition strategies, as well as designing better alternatives in the control of plant pathogens and the development of biotechnological solutions.

The long-term goal of the Millennium Institute for Integrative Systems and Synthetic Biology (MIASSB) is to understand how environmental perturbations control plant and fungal properties as individuals, and also as interacting entities. These studies consider the effect of genetic variability, abiotic perturbations (nitrogen, light, temperature), biological interactions (beneficial or detrimental) and the molecular mechanisms that govern time-dependent genetic programs, such as circadian and developmental processes.

Through an ambitious plan based on new open source synthetic biology technologies, integrative bioinformatics, systems biology, cutting-edge genomics, and molecular genetics approaches we aspire to advance the understanding of the genetic responses of plant and fungi to environmental cues.

Importantly, The MIASSB is born from the interaction between two successful Millennium Nuclei (MN) the MN for Fungal Integrative and Synthetic Biology and the MN Center for Plant Systems and Synthetic Biology,

The training of a critical mass of scientists at the MIASSB will be key to tackle these challenges from academia as well as the public and private sectors, having a positive impact on Chile, generating applied solutions and promoting technological responsibility and science literacy.



MAIN ACHIEVEMENTS

- Advancing the knowledge of the molecular networks that govern plant responses to environmental changes and the development of biotechnological approaches aimed at improving plant growth and productivity.
- Advancing the knowledge of how light and time of the day modulate the virulence of plant pathogenic fungi, such as the phytopathogen *Botrytis cinerea*.
- Contributing to the molecular dissection of complex phenomena such as circadian clocks, gene regulatory networks, spatial behavior, and morphogenesis.
- Promotion of open-source technology.

CONTACT INFORMATION

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PRODUCTIVITY PUBLICATIONS

Millennium Institute recently awarded, no publication have been reported.



ACTIVE MILLENNIUM INSTITUTE From 28/12/2017 to 28/12/2027

The Millennium Institutes have a duration of 10 years, subject to an evaluation halfway through the period.



PRESENCE REGIÓN METROPOLITANA REGIÓN DE LOS RÍOS



RESEARCH TOPICS

- Plant Nutrition.
- Fungal and Plant Biotechnology.
- Genomics and Genetics.
- Synthetic Biology and Optogenetics.
- Interacción de plantas y hongos con el medio ambiente.
- Molecular bases of Organismal Interactions.

NOTED OUTREACH ACTIVITIES

- Fostering an open dialogue with the community about the implications of plant biotechnology, fungi in industry and open-source technologies.
- Workshops and Activities focused on school teachers and students to discuss recent advances in synthetic biology and fungal and plant biotechnology.
- ArtSci (Art-science) exhibits.

HOST INSTITUTIONS:

