IV Severo Ochoa Conference

Evolutionary Strategies in Plant Biotechnology
From natural selection to synthetic innovation

Jardín Botánico de Valencia, June 18-19, 2026

Historically, Evolution and Biotechnology have been viewed as separate disciplines. However, closer examination reveals a strong potential for synergy. Insights into how metabolic and signaling pathways have evolved in plants can inform both the limitations and possibilities of biotechnological applications. In this context, Synthetic Biology offers a compelling route to bypass evolutionary constraints and develop innovative solutions. We believe that bringing together experts in evolutionary biology and synthetic biology will generate valuable cross-disciplinary dialogue.

Scientific program

Thursday, June 18th, 2026

11:30-13:30	Registration and poster setting
13:30-14:15	Lunch (outdoors, in the Botanic Garden)
14:15-14:30	Welcome address (Organizers, SEBBM, FCSyO)

Session 1: Evolution of Plant Signaling and Bioengineering Tools

14:30-15:15	Roberto Solano *(CNB, Madrid)* **The "missing hormone" and the evolution of jasmonates in land plants**
15:15-16:00	Rubén Garrido-Oter (*Max Planck Institute for Plant Breeding, Cologne*) ***Symbiotic and commensal root microbes are key determinants of plant responses to rising CO_2***
16:00-16:45	Matias Zurbriggen (*CEPLAS, University of Düsseldorf*) ***Plant synthetic and reconstruction biology approaches for the study and control of cellular processes in plants – optogenetics as an enabling technology***
16:45-17:15	Coffee break and poster viewing

Session 2: Evolution and Engineering of Metabolism

17:15-18:00 Alison Smith *(*Cambridge *University)*

Exploiting B vitamin metabolism for synthetic biology and ecology

18:00–18:45 ***Selected short talks***

Ulrich Eckhard *(IBMB-CSIC, Barcelona)* ***From Evolutionary Blueprints to Synthetic Innovation: Engineering Microbial Surface Nanomachines for Targeted Plant Protection***

Armando Albert *(IQF-CSIC, Madrid*) ***Evolution-Guided Remodeling of ABA Receptors Enables Engineering of Hormone Perception***

Maria Lois (*CRAG, Barcelona)* ***Evolution of molecular determinants for SUMO-activating enzyme subcellular localization in plants***

18:45-19:30 *Keynote EMBO lecture*

Ralph Bock (*MPI Mol Plant Physiology, Potsdam)*

Exploiting horizontal genome transfer in plant breeding and synthetic biology

21:00 Dinner (**Restaurant Contrapunto, Palau de les Arts**)

Friday, June 19th, 2026

Sesión 3: Evolution of Development and Modular Design

9:00-9:45 Edwige Moyroud (*SLCU, Cambridge*)

Blooming across scales: understanding the molecular mechanisms flowering plants use to pattern their petals and their impact on plant fitness

9:45- 10:30 Diego Orzáez *(IBMCP, Valencia)*

Exploring Novel Plant Traits Beyond Evolutionary Constraints with Bioluminescence as a Probe

10:30-11:15 Selected short talks

Isabel Monte (*ZMBP, University of Tuebingen*) ***Molecular plant-microbe interactions: from evolutionary insights to immune receptor engineering***

	Juan-José Llorens-Gámez *(IBMCP, Valencia)* ***CRISPR-Mediated Targeted Gene Replacement at the Arabidopsis thaliana MIR390a Locus Enables Artificial MicroRNA Production and Effective Gene Silencing***
	Monica Meijón *(Universidad de Oviedo)* ***From algae to angiosperms: evolutionary strategies of plant adaptation to combined heat and drought stress***
11:15-12:00	Coffee break and poster viewing

Sesión 4: High-precision Plant Biotechnology

12:00-12:45	Jake Harris (*Universidad de Cambridge)* ***Engineering chromatin states to encode transcriptional immune memory in Arabidopsis***
12:45-13:30	Caixia Gao (*Institute of Genetics and Developmental Biology, Beijing)* ***Precision Genome Editing: From Molecular Mechanisms to Crop Engineering***
13:30 -13:45	Conclusions and Farewell (organizers)
13:45- 15:00	Lunch (outdoors, Botanic Garden)