



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

DIPARTIMENTO
DI FARMACIA
E BIOTECNOLOGIE

AVVISO DI SEMINARIO

Il giorno **1 aprile 2026**
alle ore **11.00**

Dr. José Manuel Ugalde

Jr. Group Leader, University of Bonn, Germany
(ospite del Prof. M. Zaffagnini)

terrà un seminario in lingua inglese dal titolo:

An advanced platform for studying light-dependent physiological responses in vivo

in presenza:

Aula FaBiT Ue5, Via Gobetti 87, Bologna

e in streaming:

<https://teams.microsoft.com/l/meetup-join/19%3aN09c0NlyEssBnF70bCyDOQwkgDWM1qdd9f7F2nJV9fw1%40thread.tacv2/1631519544944?context=%7b%22id%22%3a%22e99647dc-1b08-454a-bf8c-699181b389ab%22%2c%22oid%22%3a%225a941351-ef41-4aa4-8771-fa50a6d62ca1%22%7d>

L'evento è organizzato nell'ambito del Corso di Dottorato in Biologia
Cellulare e Molecolare

ABSTRACT

Light is a fundamental signal for living organisms across kingdoms. Controlling the sporulation of fungi to bacterial phototaxis. In plants, excess light not only drives photosynthesis but also triggers the production of reactive oxygen species (ROS), including hydrogen peroxide (H_2O_2). While excessive ROS can cause oxidative damage, controlled H_2O_2 levels can act as signaling molecules that coordinate cellular acclimation to environmental changes. Using compartment-specific fluorescent biosensors for H_2O_2 (HyPer7) or the glutathione redox potential (EGSH, Grx1-roGFP2), we can dynamically monitor redox changes in living plants with subcellular resolution. Yet, time-resolved measurements of light-dependent processes with fluorescent reporters are challenging because illumination can be performed only between measurements, due to spectral interference. Here, we developed a novel setup with automated internal semi-continuous illumination of samples inside a fluorescence plate reader, which allows us to minimize the delay between illumination and measurement. With this setup, we measured dynamic changes in H_2O_2 and EGSH during dark-light transitions in the chloroplasts and cytosol of Arabidopsis plants using sensors targeted to both compartments. Our findings reveal synchronous light-dependent oxidation in the chloroplasts and cytosol of plant cells.

BIOGRAPHICAL SKETCH

José Manuel is a Chilean biochemist where he earned his PhD at the Pontifical Catholic University of Chile, focusing on the antioxidant role of salicylic acid in plants under the supervision of Dr. Loreto Holuigue. During his doctoral studies, he carried out two research stays at the University of Bonn, Germany, in the laboratory of Dr. Andreas Meyer, where he worked on redox biology and the use of fluorescent biosensors to monitor metabolic changes in plants in real time. After completing his PhD in 2018, he continued working on biosensors in Bonn as a postdoctoral researcher and now leads his own research group. His current research focuses on various aspects of plant redox biology, particularly the redox dynamics of different cellular sub-compartments and the characterization of redundant superfamilies involved in detoxification in plant cells. In addition to his research activities, José Manuel served as an Assistant Features Editor for the journal *Plant Physiology* and is a member of the Early Career Researcher subcommittee of the European Society for Free Radical Research (SFRR-E).