

## Italy

Maura Cardarelli  
 IBPM-National Research Council (CNR)  
 c/o Sapienza University of Rome  
 Department of Biology and Biotechnology, 00185 Rome, Italy  
[maura.cardarelli@uniroma1.it](mailto:maura.cardarelli@uniroma1.it)



### **Please describe any new experimental resources and/or software tools available to Arabidopsis researchers that have been initiated or funded in your country in 2020 or early 2021**

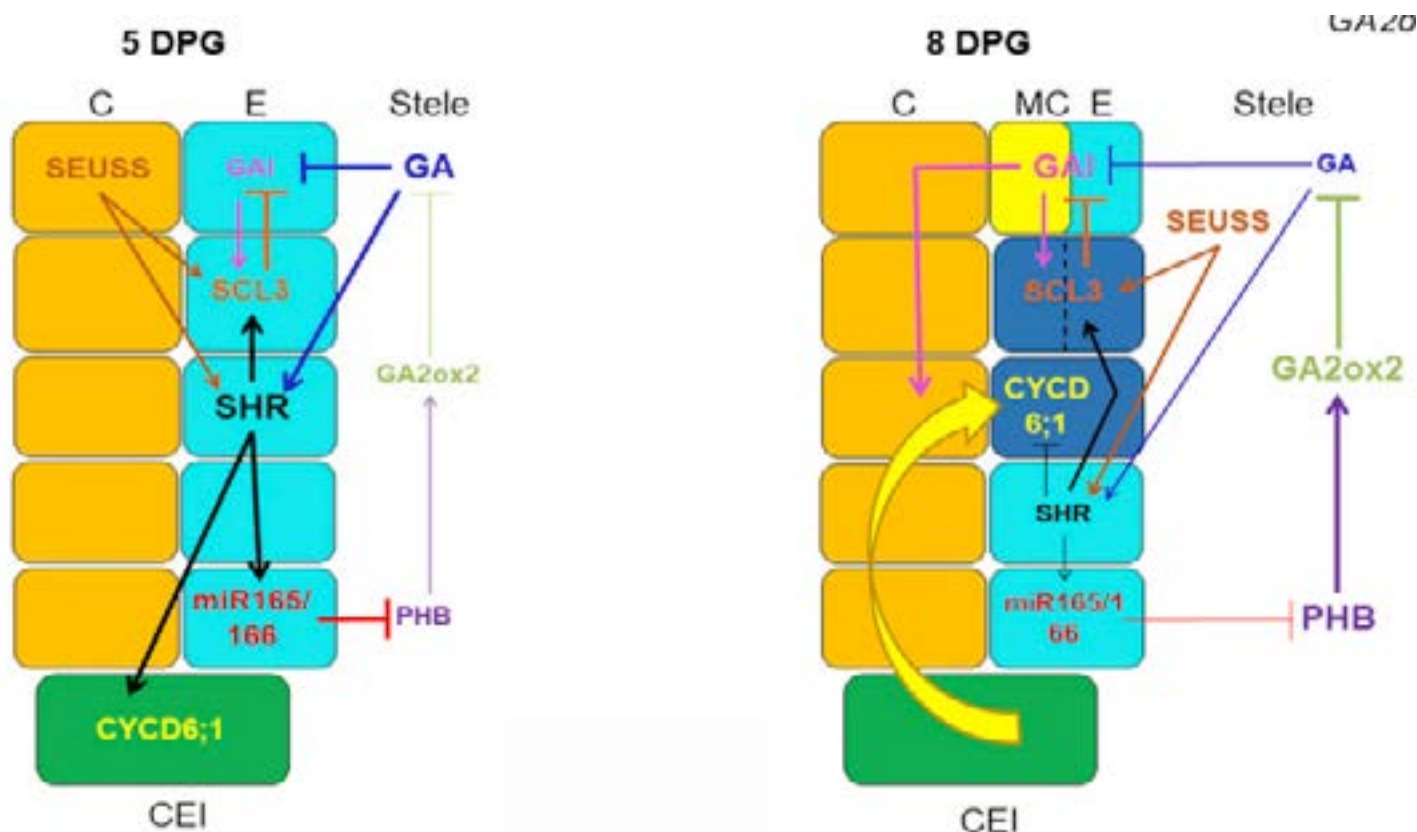
- NoMinor (NoM) mutants, knocked-out for genes encoding for the three monomeric subunits of PSII antenna proteins (CP29, CP26 and CP24)
- Characterization of two Arabidopsis polymorphisms, the SALK\_059908C and of SM\_3\_25823, named respectively, pme17-2 and pme17-3
- Single and multiple Arabidopsis T-DNA insertion lines, CRISPR-cas9 mutants, overexpressing lines and marker lines, RNA-seq data of inflorescences/Methods for Digital PCR and Polysomes profiles on Arabidopsis sample (described in Cucinotta *et al.*, 2020 and Di Marzo *et al.*, 2020)
- Switch Miner, a software for identifying genetic network utilizing transcriptome data, in Arabidopsis gave optimal preliminary results

### **Please provide a paragraph describing the general impact of the COVID19 pandemic on the scientific community in your country**

The COVID19 emergency had a large impact on plant research. In Italy, from March 2020 to May 2020, Universities and research centers were closed. Since mid-June 2020 labs were reopened, but only a small number of our PhD students and Postdocs could come into the labs per day. These restrictions had a great impact on the everyday lab activity, slowing down data production and decreasing interaction between lab members. Another issue was related with the international collaborations and exchanges, made impossible by closure of the borders. This inevitably slowed down many research projects

### **Planned events for 2021 and 2022**

1. EMBO workshop-International plant systems biology-(Venice, Italy) 26-27 April 2021 Virtual
2. Joint conference by FESPB & EPSO Plant Biology Europe 2021 (Turin, Italy) 28th June to 1st July 2021, Virtual
3. Plant Calcium Signaling conference (Milan, Italy) July 2022. 116° Conference of Italian Botany Society (Virtual, September 2021)



Model: PHB levels increase between 5 and 8 dpg, resulting in increased GA2ox2 expression. Increased GA2ox2 levels promote the degradation of GAs in the vasculature, stabilizing GAI protein. GAI directs the accumulation of CYCD6;1 in the endodermis, promoting MC formation. Decrease levels of GAs after 5 dpg dampens SHR levels that regulate miR165 and 166 and SCL3 that in turn attenuate PHB expression and GAI activity, respectively. Orange, cortex (C); cyan, endodermis (E); yellow, middle cortex (MC); green, cortex/endodermis initial (CEI); blue, periclinally dividing cells (dashed line). Yellow arrow indicates the CYCD6;1 switch.

## Selected Publications

- Bertolotti G., Unterholzner S.J., Scintu D., Salvi E., Svolacchia N., Di Mambro R., Ruta V., Linhares Scaglia F., Vittorioso P., Sabatini S., Costantino P., Dello Ioio R. (2021) *Current Biology* Jan 25;31(2):420-426. (IF 9.6)

This paper is the result of the collaboration of different groups (Italian and Brazilian Universities), that have been coordinated by a young Italian scientist and deals with developmental biology- one of the major area on which Arabidopsis research is focused on in Italy)

- Guardini, Z., Bressan, M., Caferra, R., Bassi, R., & Dall'Osto, L. (2020). Identification of a pigment cluster catalysing fast photoprotective quenching response in CP29. *Nature Plants*, 6(3), 303-313 (IF 13.2)

The research group from the University of Verona has analyzed the process by which plants protect themselves from excess light, an important step in understanding the use of energy by plants)

- Marmioli M, Lepore GO, Pagano L, d'Acapito F, Gianoncelli A, Villani M, Lazzarini L, White JC, Marmioli N. 2020 The fate of CdS Quantum Dots in plants as revealed by Extended X-ray Absorption Fine Structure (EXAFS) analysis. *Environ. Sci. Nano* 7, 1150–1162. (IF 7.9)

This applied research paper, in collaboration between University and CNR deals with cadmium tolerance and provides important insight into understanding the fate of nanoparticles in plants and in the environment)

## Major Funding Sources

Italian funding:

- Ministero dell'Università e della Ricerca (MIUR) <https://www.miur.gov.it/>
- Sapienza University of Rome <https://www.uniroma1.it>
- University 'Roma Tre' <https://scienze.uniroma3.it/>
- University of Milan: PIANO DI SVILUPPO DI ATENEIO <https://www.unimi.it>
- Regione Lazio <http://www.lazioinnova.it>

International funding:

- H2020-MSCA-RISE-2020. Mechanisms of Apomictic Developments.
- H2020-MSCA-ITN-2015-GA. Solar Energy to Biomass - Optimisation of light energy conversion in plants and microalgae
- H2020-MSCA-RISE-2015. Exploring the molecular control of seed yield in crops.
- H2020-MSCA-RISE-2015. Sexual Plant Reproduction – Seed formation MSCA-ITN-2015-ETN - Marie Skłodowska-Curie Innovative Training Networks (ITN-ETN),
- PRIMA\_2020. Partnership for Research and Innovation in the Mediterranean Area [https://prima-med.org/Private\\_funding](https://prima-med.org/Private_funding)
- Armenise Harvard Foundation Consolidator Grant <https://armeniseharvard.org/>
- Fondazione Cariplo (WAKE-APT) <https://www.fondazionecariplo.it/>