

BIOGRAPHICAL SKETCH

NAME: Alessandro Alboresi

POSITION TITLE: Associate Professor of Plant Physiology

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE	Completion Date MM/YYYY	FIELD OF STUDY
University of Milan, Italy	MS	03/2002	Plant Biotechnology
University of Versailles – INRAE Versailles, France	PHD	09/2005	Nitrogen metabolism and signaling
University of Marseille, France	Postdoctoral	11/2007	Photosynthesis
University of Verona, Italy	Postdoctoral	04/2014	Photosynthesis

A. Personal Statement

I am an Associate Professor of Plant Physiology, and my research is focused on plant response to environmental stressors such as light and nutrient availability. I have a solid background in plant physiology, with specific experience in plant nutrition, photosynthesis regulation and evo-devo studies. As PI or co-Investigator on several university-, national and EU-funded grants, I developed projects using various algae and plant system for the study of the response of photosynthetic organisms to their environment that brought to the publication of several peer-reviewed manuscripts in this field. The current application is strictly connected to activities carried out in my group and will boost the PRIN project IRONCROP for which I cover the role of national coordinator. I have the expertise and context necessary to successfully carry out the proposed research project.

Ongoing and recently completed projects:

- 2017: Local grant to study *Physcomitrella patens* response to environmental cues by the optimization of FRET-based sensors.
- 2019: Local grant in the frame of the MIUR Department of Excellence Project.
- 2020: Local grant in the frame of the MIUR Department of Excellence Project.
- 2020: GAIN4CROPS (H2020-NMBP-BIO-2019-two-stage project); coordinated by Prof. Andreas Weber (UNIVERSITAET DUESSELDORF); role: participant (Local coordinator Prof. Tomas Morosinotto).
- 2022: Participant to PNRR dedicated to biodiversity
- 2023: BESTCROP; coordinated by Prof. Paolo Pesaresi (UNIVERSITY of MILAN); role: participant (Local coordinator Prof. Tomas Morosinotto).
- 2023 – 2025: PRIN 2022KT9X3S 80K€ Local PI - INPHOMARE - Impact of nutrients availability on resources allocation and photosynthesis of marine microalgae in view of climate changes
- 2023 – 2025: PRIN-PNRR P2022ZXWLK 126K€ Project Coordinator - IRONCROP – Flavodiiron proteins to rethink photosynthesis and boost crop yield

Citations:

1. Rizzetto N, Traverso E, Sabia A, Fiorin F, Francese C, Trainotti L, Morosinotto T, **Alboresi A**. Flavodiiron Protein Activity Outcompetes Cyclic Electron Transport When Expressed in Angiosperm *Nicotiana tabacum*. *Physiologia Plantarum*. 2025 Jul-Aug;177(4):e70453.

2. Beraldo C, Traverso E, Boschini M, Cendron L, Morosinotto T, **Alboresi A**. *Physcomitrium patens* flavodiiron proteins form a redox-dependent heterocomplex. *Journal of Biological Chemistry*. 2024 Sep;300(9):107643.
3. Natale S, La Rocca N, Battistuzzi M, Morosinotto T, Nardini A, **Alboresi A**. Structure and function of bark and wood chloroplasts in a drought-tolerant tree (*Fraxinus ornus* L.). *Tree Physiology* (2023). 43(6):893-908.
4. **Alboresi A**, Storti M, Morosinotto T. Balancing protection and efficiency in the regulation of photosynthetic electron transport across plant evolution. *New Phytologist* (2019) Jan;221(1):105-109. doi: 10.1111/nph.15372.
5. Storti M, Costa A, Golin S, Zottini M, Morosinotto T, **Alboresi A**. Systemic Calcium Wave Propagation in *Physcomitrella patens*. *Plant Cell Physiology* (2018). 1;59(7):1377-1384. Corresponding author.
6. Gerotto C, **Alboresi A**, Meneghesso A, Jokel M, Suorsa M, Aro EM, Morosinotto T. Flavodiiron proteins act as safety valve for electrons in *Physcomitrella patens*. *Proceedings of the National Academy of Sciences of the United States of America* (2016). 25;113(43):12322-12327
7. **Alboresi A***, Perin G*, Vitulo N, Diretto G, Block M, Jouhet J, Meneghesso A, Valle G, Giuliano G, Maréchal E, Morosinotto T. Light Remodels Lipid Biosynthesis in *Nannochloropsis gaditana* by Modulating Carbon Partitioning between Organelles. *Plant Physiology* (2016). Aug;171(4):2468-82.

Positions and Scientific Appointments

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|-------------------|--|
| 06/2020 – today | Associate Professor in Plant Physiology (BIO/04). Università di Padova (Italy). "Photosynthesis regulation, autophagy and Calcium signaling in plants" |
| 06/2017 – 05/2020 | Researcher (Ricercatore di tipo B) in Plant Physiology (BIO/04). Università di Padova (Italy). "Photosynthesis regulation and Calcium signaling in algae and bryophytes" |
| 05/2015 – 05/2017 | Researcher (Ricercatore di tipo A) in Plant Physiology (BIO/04). Università di Padova (Italy). "Photosynthesis regulation in algae and bryophytes". |
| 05/2014 – 04/2015 | Post-doctoral fellow, "Assegno di Ricerca". Università di Padova (Italy). Lab director: Prof. Tomas Morosinotto. "Molecular tools to improve algae growth in photobioreactors". BioLEAP Project (ID: 309485 - FP7-IDEAS-ERC) |
| 12/2007 – 04/2014 | Post-doctoral fellow, "Assegno di Ricerca". Università di Verona (Italy). Lab director: Prof. Roberto Bassi. "ROS (Reactive Oxygen Species) signaling in <i>Arabidopsis thaliana</i> "; "Photosynthesis and photoprotection in <i>Physcomitrella patens</i> "; "Mutagenesis and screening of <i>Nannochloropsis gaditana</i> ". FIRB-Parallelomics and CARIVERONA project "Biomasse di oggi e di domani: dai reflui zootecnici e dalle microalghe un contributo all'agricoltura sostenibile e all'energia rinnovabile" |
| 12/2005 – 11/2007 | Post-doctoral fellow. UMR 7265, Université de Marseille (France). Lab director: Prof. Christophe Robaglia. "Photoprotection in photosystem I of vascular plants"; "Characterization of the two photosystems of <i>Physcomitrella patens</i> ". Human Potential Program Grant HPRN-CT-2002-00248 (Photosystem I consortium). |
| 09/2002 – 09/2005 | PhD thesis. INRA Versailles-Grignon (France). Supervisors: Christian Meyer and Hoai-Nam Truong. "Physiology and genetics of nitrate signaling in <i>Arabidopsis thaliana</i> ". Research Training Network PLUSNitrate. |
| 03/2001 – 03/2002 | Master thesis. Università di Milano (Italy). Supervisor: Prof. Marcello Duranti. "Cloning and expression in <i>Saccharomyces cerevisiae</i> of a conglutin-gamma of <i>Lupinus albus</i> ". |
| 01/2001 – 04/2001 | Stage within ERASMUS program. Technische Universität München of Freising (Germany). Supervisors: Dr Ludwig Niessen and Dr. Holger Schmidt. "Ochratoxin A detection and AFLP analyses of <i>Penicillium verrucosum</i> strains". |

C. Contributions to Science

My early publications directly addressed the fact that nitrate is not only a nutrient for plant, but it can also function as a signaling ion, which promotes seed germination in the model plant *Arabidopsis thaliana*. The establishment of a robust experimental setup allowed to use transcriptomics for the identification of an important enzyme playing a role in abscisic acid catabolism. This evidence allowed to connect nitrate signaling function with seed ormonal network for the relief of seed dormancy.

1. Matakias T, **Alboresi A**, Jikumaru Y, Tatematsu K, Pichon O, Renou JP, Kamiya Y, Nambara E, Truong HN. The Arabidopsis abscisic acid catabolic gene *CYP707A2* plays a key role in nitrate control of seed dormancy. *Plant Physiology* (2009). 149(2), 949-960.
2. **Alboresi A**, Gestin C, Leydecker MT, Bedu M, Meyer C, Truong HN. Nitrate, a signal relieving seed dormancy in Arabidopsis. *Plant, Cell and Environment* (2005). 28, 500-512.

My publications as post-doc and later as PI established the use of *Physcomitrium patens* as model system for the study of photosynthesis. It is moss, a non-vascular plant belonging to the group of bryophytes and largely used for the study of water-to-land transition in plant kingdom. We demonstrated that *P. patens* is a land plant which carries mechanisms of photoprotection typically present in algae, but also mechanisms present in vascular plants.

1. Storti M, Puggioni MP, Segalla A, Morosinotto T, **Alboresi A**. Chloroplast NADH dehydrogenase-like complex influences the photosynthetic activity of the moss *Physcomitrella patens*. Accepted for publication in Journal of Experimental Botany (2020). Sep 19;71(18):5538-5548. doi: 10.1093/jxb/eraa274.
Corresponding author
2. Pinnola A, Dall'Osto L, Gerotto C, Morosinotto T, Bassi R, **Alboresi A**. Zeaxanthin binds to LHCSR protein to Enhance Non-Photochemical Quenching in *Physcomitrella patens*. *The Plant Cell* (2013). Sep;25(9):3519-34.
3. **Alboresi A**, Gerotto C, Giacometti GM, Bassi R, Morosinotto T. *Physcomitrella patens* mutants affected on heat dissipation clarify the evolution of photoprotection mechanisms upon land colonization. *Proceedings of the National Academy of Sciences of the United States of America* (2010). Jun 15;107(24):11128-33.

Complete List of Published Work in MyBibliography:

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