CURRICULUM VITAE

Prof. Matteo Ballottari

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EDUCATION:

- 2008: PHD degree in Agricultural and Industrial Biotechnologies at the University of Verona
- 2004: Laurea cum Laude in Biotechnology at the University of Verona
- 1998: School leaving certificate awarded after five years at Scientific Liceum "Leonardo da Vinci" Cerea (VR), with full marks.

LANGUAGES:
Italian, English

SCIENTIFIC RESEARCH EXPERIENCE AND ACADEMIC POSITIONS:

- November 2014- today: Associate Professor in Plant Physiology at the Department of Biotechnology, University of Verona.
- May 2011- October 2014: Assistant Professor in Plant Physiology at the Department of Biotechnology, University of Verona.
- January 2008- May 2011: Post-doctoral activity at the Department of Biotechnology, University of Verona. Main subject of scientific research was the regulation of light harvesting and photoprotection in higher plants and microalgae.
- January 2005- December 2008: PhD thesis in Agricultural and Industrial Biotechnology at the Department of Biotechnology, University of Verona. PhD thesis title: **"**The functional organization of Plant Photosystems: biochemical and spectroscopic analysis of the role of antenna proteins in photoprotection and acclimation to environmental conditions".
- September-December 2004: fellowship at the Scientific and Technological Department of the University of Verona. Scientific research was focused on acclimation of higher plants at different growth conditions.
- April 2003-July 2004: MSc thesis at the Department of Biotechnology, University of Verona, under the supervision of prof. Roberto Bassi.

AWARDS:

- "Franca Rasi Caldogno" 2009 National Award for the best PHD thesis in Plant Physiology, given by the Italian Society of Plant Biology.
- SIGA-AGI-SIBV Joint Meeting Award for the best poster presented at the Joint Meeting for Italian societies of Plant Biology, Genetic and Plant Genetics 2011, Assisi 19-22 September 2011.
- SEB-WILEY-TPJ annual awards to the most outstanding authored resource article published in "The Plant Journal" in 2019 for the paper "Chlorella vulgaris genome assembly and annotation reveals the molecular basis for metabolic acclimation to high light conditions. THE PLANT JOURNAL Volume 100, Issue 6, Pages 1289-1305."
- "Honourable mention" from Regione Veneto (Italy) for the research project 1695-4-11-2018 "Development of an innovative vertical farming system based on artificial intelligence and waste product recovery
- Certification of "top cited article 2020-2021" by Wiley publisher for the paper "Turning a green alga red: engineering astaxanthin biosynthesis by intragenic pseudogene revival in *Chlamydomonas reinhardtii*, Plant Biotechnol J. 2020 Feb 25; 18(10):2053-2067. doi: 10.1111/pbi.13364"
- "A. Baccarini Melandri 2022" award given by the Italian Society of Plant Biology.

Achievement of ABILITAZIONE SCIENTIFICA NAZIONALE as Full Professor for the SSD 05 / E2 (Molecular Biology) starting from 13/05/2021

Achievement of ABILITAZIONE SCIENTIFICA NAZIONALE as Full Professor for the SSD 05 / A2 (Plant Physiology) starting from 11/09/2019

Achievement of ABILITAZIONE SCIENTIFICA NAZIONALE as Full Professor for the SSD 05 / E1 (Biochemistry) starting from 05/12/2017

Achievement of ABILITAZIONE SCIENTIFICA NAZIONALE as Associate Professor for the SSD 05 / A2 (Plant Physiology) starting from 31/01/2014

Achievement of ABILITAZIONE SCIENTIFICA NAZIONALE as Associate Professor for the SSD 05 / E1 (Biochemistry) starting from 16/06/2014

GRANTS:

- FSE 2012 (European Social Funds) grant financed by Regione Veneto in collaboration with the company Algain Energy srl for training your researcher on microalgae cultivation. Principal Investigator

- FSE 2013 (European Social Funds) grant financed by Regione Veneto in collaboration with the company Algain Energy srl for training your researcher on production of high value products from microalgae. Principal Investigator

- PRIN 2012 grant financed by MIUR (Ministero dell'istruzione, dell'università e della ricerca) as local PI in a research project entitled: “Improving biofuels and high added value molecules production from microalgae”. Responsible of Research unit.

- JOINT PROJECT 2013 grant financed by the University of Verona (50%) and Algain Energy (50%) for pigments and omega-3 production in microalgae. Principal Investigator

- ERC STARTING GRANT 2015, title of the project: “Improving photosynthetic Solar Energy conversion in microalgal cultures for the production of biofuels and high value products (SOLENALGAE)”. Principal Investigator

- JOINT PROJECT 2016 grant financed by the University of Verona (50%) and ALGAE-TECH (NL) (50%) for omega-3 production in microalgae. Principal Investigator

- FARE 2016 grant financed by MIUR (Ministero dell'istruzione, dell'università e della ricerca) focused on the development of genome editing technologies in microalgae. Principal Investigator.

- ERC POC 2018, title of the project: “IMPLEMENTATION OF A SUSTAINABLE AND COMPETITIVE SYSTEM TO SIMULTANEOUSLY PRODUCE ASTAXANTHIN AND OMEGA-3 FATTY ACIDS IN MICROALGAE FOR ACQUACULTURE AND HUMAN NUTRITION (ASTAOMEGA)”. Principal Investigator

- JOINT PROJECT 2018 grant financed by the University of Verona (50%) and ONO EXPONENTIAL FARMING (IT) (50%) to develop an innovative indoor system for the production of astaxanthin. Principal Investigator

- FSE 2018 (European Social Funds) grant financed by Regione Veneto in collaboration with the company TOR.MEC AMBROSI srl, Algain Energy srl and the University of Trieste for the implementation of innovative vertical farming cultivation systems. Principal Investigator

- CARIVERONA FUNDATION "Ricerca e Sviluppo 2019". Research project: "Implementation of an innovative vertical farming system for Agriculture 4.0" in collaboration with the company Ono Exponential Farming srl. Principal Investigator

- ERC POC 2019, title of the project: "Innovative and efficient production in microalgae of easily extractible and highly pure Astaxanthin for added-value products (ASTEASY)". Principal Investigator

- FSE 2019 (European Social Funds) grant financed by Regione Veneto in collaboration with the company ONO EXPONENTIAL FARMING srl, BLUE DROPS srl and the University of Trieste. Title of the project: " VALORISATION OF WASTE FROM THE AGRI-FOOD CHAIN FOR THE PRODUCTION OF NOVEL FOOD AND FOR THE IMPROVEMENT OF PRODUCTION YIELDS IN TRADITIONAL AND INNOVATIVE AGRICULTURAL SYSTEMS ". Principal Investigator

- JOINT RESEARCH 2021 grant financed by the University of Verona (50%) and ALGAE SPA (50%) to develop an innovative indoor system for microalgae cultivation. Principal Investigator

- HORIZON EUROPE EIC-TRANSITON ASTEASIER, title of the project "Novel and sustainable biotechnological approaches for astaxanthin and ketocarotenoids production. Principal Investigator

<u>Principal Investigator also for projects funded entirely by the following companies:</u>

ALGAE-TECH B.V. (NL) for a research project on biofuels production from microalgae. Principal Investigator

SISWAT (Barbados) for a research project on lipid production from microalgae. Principal Investigator

JOA VENTURES B.V.(NL) for a research project focused to improve the production of astaxanthin in green algae. Principal Investigator

ALGAE spa (IT) for a research project on the cultivation of Spirulina at an industrial level

MICRO BIOTECHNOLOGLY srl (IT) for a research project on the cultivation of *Haematococcus pluvialis* at an industrial level

ALGAE & ALGAE SOCIETÀ AGRICOLA RL for research project aimed to produce biomethane from microalgae

ACCADEMIC TEACHING EXPERIENCE:

2019- today "Metabolic Engineering for the production of high value products" 48 CFU, Master degree in Biotechnology for bioresources and sustainable development at the University of Verona, Department of Biotechnology
2018- today "Laboratory of Molecular Biology", 48 CFU, bachelor degree course in Bioinformatics at the University of Verona, Department of Informatics
2015- today "Bio-exploitation of Solar Light Energy" 52 CFU, bachelor degree course in Biotechnology at the University of Verona, Department of Biotechnology

2015 Invited for a lecture at the Plant Biology Winter School 2015 organized by the Italian Society of Plant Biology (SIBV).
2012-2018 "Principles of Biochemistry", 48 CFU, master degree course in Sciences and Technologies of Bio and Nanomaterials at the University of Venice Ca' Foscari
2010-2011 "Biology", bachelor degree course in Biotechnology, University of Verona, Faculty of Sciences MM.FF.NN.
2011 and 2018 Invited for lectures on "The Photosystems" at the Photosynthesis section at the European School for Photobiology (ESP)
2008-2009 "Biology", bachelor degree course in Bioinformatics, University of Verona, Faculty of Sciences MM.FF.NN.
2008-today Tutor for 9 PHD students, 27 Master thesis, 23 Bachelor thesis and co-tutor for 1 PHD thesis and 7 Master thesis at the Department of Biotechnology, University of Verona.

INSTITUTIONAL RESPONSIBILITIES

2018- Coordinator for the PHD program "Biotechnology" at the University of Verona
2017- Faculty Member of the PHD program "Biotechnology" at the University of Verona
2011 – Faculty member, Department of Biotechnology, University of Verona
2011 – 2017 Faculty Member of the PHD program "Molecular, Industrial and Environmental Biotechnology at the University of Verona

REVIEWER /EDITORIAL DUTIES

2017- Editorial Board member and Guest Editor for "International Journal of Molecular Sciences" journal

2019- Editorial Board member and Guest Editor for the journal "Frontiers of Plant Sciences"

2020- Editorial board member for the journal BMC PLANT BIOLOGY

2014 - Editorial Board member for "International Journal of Biotechnology & Bioengineering"

2016- Review panel member for The Netherlands Organization for Scientific Research (NWO), Human Science Frontier Program, Czech Science Foundation, Italian Ministry for Ministry for Education University and Research

2007- reviewer for scientific journals as Nature Communications, BBA, BMC genomics, IJMS, Algal Research, Bioresource technology, Peer J, Journal of Phycology, The Plant Journal, Journal of Biotechnology, Journal of Applied Phycology, Biotechnology for Biofuels, Photosynthesis research, Langmiur, Marine Drugs, BBA, Journal of Phycology, Bioresource technology. Microbial Cell Factory

MEMBERSHIPS OF SCIENTIFIC SOCIETIES

2010 – Associated Member of International Society of Photosynthesis
2012 – Associated Member of Italian Society of Plant Biology
2016 – Member of the Young Academy of Science
2019- Member of the Italian Association for the Study and Application of Microalgae (AISAM).

PARTICIPATION TO INTERNATIONAL OR NATIONAL MEETINGS

Chair responsibilities:

- XVI FISV 2022 congress, Portici 14-16/09/2022. Chairman for the session "Current trends in Biotechnology"
- AQUAFARM 2022 congress, Pordenone 25-27/05/2022. Chairman for the session "Biocompounds / Bioactive molecules"
- AISAM 2020 congress, Padua 7/09/2020. Chairman for the session "Obtaining more from microalgae"

International meeting, oral presentations:

- MELISSA CONFERENCE: CURRENT AND FUTURE WAYS TO CLOSED LIFE SUPPORT SYSTEM. Tolose (France) 7-10 November 2022. Selected oral presentation: "Green algae for sustainable edible proteins production".
- PLANT BIOLOGY EUROPE 2021, 28/06/21-01/07/21. Selected oral presentation: LPA2 protein is involved in Photosystem II assembly in *Chlamydomonas reinhardtii*
- 10th International Conference on Algal Biomass, Biofuels and Bioproducts 2021. 14-16/06/21. Selected oral presentation: *Nannochloropsis gaditana* as a biofactory for astaxanthin and EPA
- INTERNATIONAL WORKSHOP ON TECHNOLOGY INNOVATION OF ALGAE "Iran Algae 2021". 1-3 May 2021. Invited talk: "NOVEL BIOTECHNOLOGICAL APPROACHES TO PRODUCE KETOCAROTENOIDS IN MICROALGAE".
- INTERNATIONAL BIOENERGY AND ENVIRONMENT CONGRESS (I-BE-C) 2021. 16-18 February 2021. Selected oral presentation: "Novel biotechnological approaches to produce ketocarotenoids in microalgae"
- MELISSA CONFERENCE: CURRENT AND FUTURE WAYS TO CLOSED LIFE SUPPORT SYSTEM. 3-5 November 2020. Selected oral presentation: "Production of high-quality edible biomass with high levels of antioxidants by genetic engineering of the photosynthetic microalga Chlamydomonas reinhardtii."
- AlgaEurope 2020. International Meeting on Algae-cultures. 1-4 December 2020. Selected oral presentation: "Simultaneous production of astaxanthin and EPA in Nannochloropsis gaditana"
- European Research Council Conference "Frontier Research: Creating Pathways to Sustainability" 2-3 December 2019. Invited talk:" Improving photosynthetic solar energy conversion in microalgal cultures for the production of biofuels and high value products"
- "Plant Biology 2019" congress, San Jose, CA, USA, 3-7 August 2019. Selected oral presentation: "Turning a green alga red: engineering astaxanthin biosynthesis by intragenic pseudogene revival in *Chlamydomonas reinhardtii*".
- 9th International Conference on Algal Biomass, Biofuels & Bioproducts, Boulder, CO, USA,9-12 June 2019. Selected oral presentation: "Effect of CO2 concentration on photosynthetic and respiratory pathways in different green algal species"
- 32nd Annual meeting of the Korean Society of Phycology, October 25-26, 2018, Gangwon-do, South Korea. Invited talk: "Biotechnological manipulation of carotenoid biosynthetic pathway to induce astaxanthin accumulation in *Chlamydomonas reinhardtii*"
- 1st European Congress on Photosynthesis Research ePS-1. June 25-28, 2018, Uppsala, Sweden. Selected oral presentation: "Molecular basis of autotrophic vs mixotrophic growth in Chlorella sorokiniana"
- 8th International Conference on Algal Biomass, Biofuels and Bioproducts, Seattle (USA), 10-14 June 2018. Selected oral presentation: "Genome assembly and annotation of the green alga Chlorella vulgaris"
- STOA-ERC event "Investing in Young Researchers, Shaping Europe's Future" at the European Parliament in Strasbourg, on 30-31 May 2018. Invited talk at the exchange session "Modern energy solutions"
- 7th Int. CeBiTec Research Conference Bielefeld (Germania), 24-27/09/2017. Selected oral presentation: "Differential gene expression analysis of Chlorella sorokiniana cultivated in autotrophic vs. mixotrophic conditions reveals fine control of metabolism"

- The 7th International Conference on Algal Biomass, Biofuels and Bioproducts, Miami (USA) 18-21 June 2017, selected oral presentation: "Constitutive LHCSR expression as a strategy to increase productivity in microalgae"
- 17th International Congress on Photosynthesis Research" Maastricht: 7-12 August 2016; selected oral presentation: "LIGHT HARVESTING STRESS RELATED (LHCSR) PROTEINS ARE EXCITATION ENERGY QUENCHERS FOR BOTH PHOTOSYSTEM I AND II IN CHLAMYDOMONAS REINHARDTII."
- International meeting "Light Harvesting Satellite meeting", Washington University ST. LOUIS (MO- USA): 7-11 August 2013; invited presentation: "Identification of a Zeaxanthin-Dependent Regulation of Antenna Size in Higher Plants PhotoSystem I"
- International meeting "Light-Harvesting Processes", Banz manstery Germaly 7-11 April 2013, selected oral presentation: "Identification of a Zeaxanthin-Dependent Regulation of Antenna Size in Higher Plants PhotoSystem I"
- ALGAE –EUROPE, International Meeting on Algae-cultures, Rome 7 September 2012 in the framework of ZERO-EMISSION congress, invited talk: "Engineering unicellular green algae for improved light use efficiency in closed photobioreactors".
- International Workshop "Mechanisms of Non-Photochemical quenching", April 6-10 2011, Passau, Germany, selected oral presentation: "Analysis of LhcSR3, a Protein Essential for Feedback De-Excitation in the Green Alga Chlamydomonas reinhardtii".
- Photosynthesis Workshop 11 Oct – 14 Oct 2009 Munich, Germany; invited presentation: "Proteomic and physiologic analysis of the chloroplast to chromoplast transition in tomato fruits".
- Invited during April 2007 at the University of California, Berkeley, Department of Plant and Microbial Biology, for a talk about "Acclimation of higher plants at different growth conditions"

National meeting, oral presentations:

- ACQUAFARM, Fiera Pordenone, 19-20 Febbraio 2020. Invited oral talk: "Biotechnological engineering of the biosynthetic pathway of carotenoids to induce the production of astaxanthin in Chlamydomonas reinhardtii"
- Joint Congress SIBV-SBI, Padua, 4-6 September 2019. Selected oral presentation: "Effect of CO2 concentration on photosynthetic and respiratory pathways in different green algal species".
- ACQUAFARM, Fiera Pordenone, 15-16 February 2018. Invited talk: "Astaxanthin production in microalgae: limits and possible biotechnological solutions "
- Research Night -Veneto Night 2017. 30/09/2017, invited talk: "Produzione di molecole ad alto valore aggiunto da microalghe"
- Forum Italiano sulle Tecnologie Microalgali (FITEMI – 2017), Palermo 6-7 April 2017. Selected oral presentation: "IMPROVING PHOTOSYNTHETIC SOLAR ENERGY CONVERSION IN MICROALGAL CULTURES FOR THE PRODUCTION OF BIOFUELS AND HIGH VALUE PRODUCTS"
- ACQUAFARM, Fiera Pordenone, 26-27 January 2017. Invited talk: " Increased biomass, biofuels and high value products production through improvement of photosynthetic efficiency in microalgae cultures: objectives and methodologies of the Solenalgae project "
- VENETONIGHT 2016, 30/09/2016, invited talk: "PRODUCTION OF BIOFUELS, FOOD SUPPLEMENTS AND ANTIOXIDANTS THROUGH MICROALGAE "
- GALILEO FESTIVAL DELL'INNOVAZIONE, Padua 5-7 May 2016. Invited talk: "PRODUCTION OF BIOFUELS AND HIGH VALUE ADDED PRODUCTS THROUGH THE CULTIVATION OF MICROALGAE "

- II Congress of Italian Society of Plant Biology, Rome 12-14 July 2010, invited presentation: "Biochemical, Proteomic and Physiological Analysis of Chloroplast-Chromoplast Transition In Solanum Lycopersicum
- I Congress of Italian Society of Plant Biology, Verona 30 Giugno-02 July 2009, invited presentation: "Dissipation of Excess Energy in Light Harvesting Plants"
- XLVII Congress of Italian Plant Physiology Society, Pisa, 30 June – 02 July 2008, invited presentation: "EXCITONIC TUNING OF A CHARGE-TRANSFER STATE REGULATES PHOTOSYNTHETIC LIGHT HARVESTING IN PLANTS"

Poster presentation:

- INTERNATIONAL CONGRESS ON PHOTOSYNTHESIS RESEARCH July 31 to August 5, 2022, New Zealand, poster presentation: "Engineering astaxanthin accumulation reduces photoinhibition and increases biomass productivity under high light in Chlamydomonas reinhardtii".
- 19th international Conference on the Cell and Molecular Biology of Chlamydomonas, 29 Aug-3 Sep 2021 83140 Six-Fours-les-Plages (France), poster presentation: "Evolution, distribution and function of G-proteins in *Chlamydomonas reinhardtii* and *Chlorella vulgaris*"
- Proteine 2018, Verona, 28-30 May 2018, poster presentation: "Light dependent redox catalysis by Photosystem I complexes encapsulated in organic nanoparticles"
- 1st Joint AgroSpace-MELiSSA Workshop, Rome, May 16-18, 2018, poster presentation: "Photosynthetic microalgae as a sustainable platform for the production of high quality edible biomass"
- Joint congress SIBV-SIGA, Milano 8-11 September 2015, poster presentation: "INCREASED BIOMASS PRODUCTIVITY IN GREEN ALGAE BY TUNING NON-PHOTOCHEMICAL-QUENCHING"
- "QualityFruit" Workshop, Verona 5-6 June 2015, poster presentation: "BIOCHEMICAL AND PHYSIOLOGICAL EFFECTS OF PSBS GENE SILENCING BY RNAI IN SOLANUM LYCOPERSICUM"
- International meeting "Light-Harvesting Processes", Banz manstery Germaly 8-12 March 2015, poster presentation: "CAN LHCII SUBSTITUTE LHCI EFFICIENTLY AS PHOTOSYSTEM I ANTENNA SYSTEM?"
- VI Congress of Italian Society of Plant Biology, Pisa 24– 27th September, 2014, poster presentation: "PHOTOSYNTHETIC RESPONSE TO NITROGEN STARVATION AND HIGH LIGHT IN HAEMATOCOCCUS PLUVIALIS"
- V Congress of Italian Society of Plant Biology, Foggia 18– 20th September, 2013, poster presentation: "THE LHCBM9 SUBUNIT OF THE MAJOR LIGHT-HARVESTING COMPLEX LHCII HAS A UNIQUE PROTECTIVE ROLE WITHIN THE FAMILY OF LHC PROTEINS OF CHLAMYDOMONAS REINHARDTII UPON SULFUR STARVATION.".
- "16th International Congress on Photosynthesis Research" ST. LOUIS (MO- USA): 11-16 August 2013; poster presentation: "BIOCHEMICAL AND PHYSIOLOGICAL EFFECTS OF *PSBS* GENE SILENCING BY RNAI IN SOLANUM LYCOPERSICUM"
- AGI-SIGA-SIBV Joint meeting for Italian societies of Plant Biology, Genetic and Plant Genetics, poster presentation: "BIOCHEMICAL AND PHYSIOLOGICAL EFFECTS OF PSBS GENE SILENCING BY RNAi IN SOLANUM LYCOPERSICUM", Assisi 19-22 September 2011.
- 15th International Congress of Photosynthesis, Beijing 22-27 August 2010, poster presentation: "QUENCHING EFFICIENCY, ZEAXANTHIN DEPENDENCE AND MOLECULAR DETAILS OF AGGREGATION-DEPENDENT ENERGY QUENCHING IN MONOMERIC AND TRIMERIC ANTENNA PROTEINS OF PHOTOSYSTEM II
- I Congress of Italian Society of Plant Biology, Verona 30 June-02 July 2009, poster presentation: "MODULATION OF PHOTOSYNTHETIC ACTIVITY DURING CHLOROPLAST-CHROMOPLAST TRANSITION".

Other abstract presented at national or international congresses:

- SOL2010, 7th Solanaceae conference, Dundee, Scotland, 5-9 September 2010, poster presentation: "CHLOROPLAST-CHROMOPLAST TRANSITION IN TOMATO FRUIT: PROTEOMIC AND RNAi APPROACHES"
- SIGA (Italian Society of Plant Genetics), 53° Congress, Turin 16-19 September 2009, poster presentation: "PROTEOMICS AND FUNCTIONAL GENOMICS APPROACHES TO EXPLORE CHLOROPLAST-CHROMOPLAST TRANSITION IN TOMATO FRUIT"
- 14° International Congress of Photosynthesis, Glasgow, 22-27 July 2007, poster presentation: "KINETIC ANALYSIS OF ENERGY AND ELECTRON TRANSFER PROCESSES IN PSI PARTICLES FROM ARABIDOPSIS THALIANA"
- 13° International Congress of Photosynthesis, Montreal 2004, poster presentation: "EFFECT OF XANTHOPHYLL COMPOSITION ON HIGHER PLANTS PHOTOSYSTEM I-LIGHT HARVESTING I COMPLEX."

RESEARCH EXPERIENCE ABROAD:

- April 2012: visit at the Department of Chemistry and Department of Plant and Microbial Biology University of California, Berkeley, under the supervision of prof. G. Fleming.

- April 2009: visit at the Department of Chemistry e Department of Plant and Microbial Biology University of California, Berkeley, under the supervision of prof. G. Fleming..

- July 2008 : Laboratoire de Genetique et de Biophysique des Plantes, Faculte des Sciences de Luminy, UMR 6191 CNRS-CEA-Universite Aix-Marseille II, uder the supervision of prof. R. Heinerwadel.

- April 2007: Department of Chemistry and Department of Plant and Microbial Biology University of California, Berkeley, under the supervision of prof. G. Fleming.

- September 2006: National Laboratory of Biomacromolecules, Institute of Biophysics, Chinese Academy of Sciences, 15 Datun Road, Chaoyang District, Beijing 100101, People's Republic of China, under the supervision of prof. Chang Wengrui.

- November 2004: Robert Hill Institute, Department of Molecular Biology and Biotechnology, University of Sheffield, FirthCourt, WesternBank, Sheffield S102TN,UK under the supervision of professor Peter Horton.

- Collaborations with the following national/international institutes (selected):
- Department of Chemistry, University of California, Berkeley, CA 94720, USA, (prof. G. Fleming)
- Department of Plant and Microbial Biology University of California, Berkeley, (prof. K. Nyogi)
- Algae Biotechnology and Bioenergy Group, Department of Biology, Center for Biotechnology, Bielefeld University, D-33615 Bielefeld, Germany, (prof. O. Kruse).
- CEA - CNRS - Université Aix Marseille, (Dr. Yonghua LI-BEISSON)
- Department of Life Sciences, Institute of Botany, B22, 27, Bld du rectorat, University of Liège, B-4000 Liège, Belgium, (Prof.ssa Claire Remacle)
- Hanyang University, Seul (Republic of Korea, Prof. Eonseon Jin)
- Department of Chemistry, MIT (Boston, USA) Prof. Gabriela Schlau-Cohen
- Politecnico di Milano, Department of Physics (Prof. Giulio Cerullo, Prof. Dario Polli)
- Istituto Italiano di Tecnologia, Milano (Prof. Cosimo D'Andrea, Prof. Guglielmo Lanzani)
- Dipartimento di Biologia, Università di Padova, (Prof. Tomas Morosinotto)
- Dipartimento di Ingegneria Industriale, Università di Padova, (Prof. Alberto Bertucco)
- Dipartimento di Scienze della Vita e Biologia dei Sistemi, Università di Torino (Prof. Massimo Maffei)

SPECIALIZATION COURSES:

- Specialization course on ADR regulations and disposal of waste materials management, organized by AMIA VERONA SPA, 25-29 September 2009
- School of Photochemistry, organized by the Italian Society of Photochemistry 3-7 September 2007
- Preparative Chromatography HPLC school, organized by Gilson Italy, Padua 3-05-2007

SCIENTIFIC PUBBLICATIONS:
Overall research activity led to publication of 70 articles in peer reviewed journals and 1 book chapter, which were cited 3981 times by 2392 documents. H-index is 36 according to SCOPUS (updated at 27/06/22).

Publications with peer-review:

1. **Ballottari M,** Govoni C, Caffarri S, Morosinotto T. *Stoichiometry of LHCI antenna polypeptides and characterization of gap and linker pigments in higher plants Photosystem I.* **Eur J Biochem**. 2004 Dec;271(23-24):4659-65.

2. Hienerwadel R, Gourion-Arsiquaud S, **Ballottari M,** Bassi R, Diner BA, Berthomieu C**.** *Formate binding near the redox-active tyrosineD in photosystem II: consequences on the properties of tyrD.* **Photosynth Res.** 2005 Jun;84(1-3):139-44.

3. Morosinotto T, **Ballottari M,** Klimmek F, Jansson S, Bassi R**.** *The association of the antenna system to photosystem I in higher plants. Cooperative interactions stabilize the supramolecular complex and enhance red-shifted spectral forms.* **J Biol Chem.** 2005 Sep 2;280(35):31050-8.

4. **Ballottari M,** Dall'Osto L, Morosinotto T, Bassi R. *Contrasting behavior of higher plant photosystem I and II antenna systems during acclimation.* **J Biol Chem**. 2007 Mar 23;282(12):8947-58.

5. Avenson TJ, Ahn TK, Zigmantas D, Niyogi KK, Li Z, **Ballottari M**, Bassi R, Fleming GR. *Zeaxanthin radical cation formation in minor light-harvesting complexes of higher plant antenna.* **J Biol Chem**. 2008 Feb 8;283(6):3550-8.

6. Slavov C, **Ballottari M,** Morosinotto T, Bassi R, Holzwarth AR**.** *Trap-limited charge separation kinetics in higher plant photosystem I complexes.* **Biophys J.** 2008 May 1;94(9):3601-12.

7. Ahn TK, Avenson TJ, **Ballottari M**, Cheng YC, Niyogi KK, Bassi R, Fleming GR. *Architecture of a charge-transfer state regulating light harvesting in a plant antenna protein*. **Science.** 2008 May 9;320(5877):794-7.

8. Cheng, Y-C, Ahn, T.K. Avenson, T.J. Zigmantas, D, Niyogi, K.K. **Ballottari, M**. Bassi R.and Fleming G. R. (2008) *Kinetic modelling of charge-transfer quenching in the CP29 minor complex of Photosystem II.* **The Journal of Physical Chemistry B**. Oct 23;112(42):13418-23.

9. Avenson, T.J., Ahn, T.K., Niyogi, K.K., **Ballottari, M.,** Bassi, R., and Fleming, G.R. *Lutein Can Act as a Switchable Charge Transfer Quencher in the CP26 Light-harvesting Complex* **J Biol Chem**. 2009 Jan 30;284(5):2830-5.

10. **Ballottari M**, Mozzo M, Croce R, Morosinotto T and Bassi R. *Occupancy and functional architecture of the pigment binding sites of photosystem II antenna complex Lhcb5*. **J Biol Chem**. 2009 Mar 20;284(12):8103-8113.

11. Betterle N*, **Ballottari M***, Zorzan S, de Bianchi S, Cazzaniga S, Dall'Osto L, Morosinotto T and Bassi R. *Light-induced dissociation of an antenna hetero-oligomer is needed for non-photochemical quenching induction.* **J. Biol. Chem.** 2009 May 29;284(22):15255-66.

12. Alboresi A, **Ballottari M**, Hienerwadel R, Giacometti G., Morosinotto T,. *Antenna complexes protect Photosystem I from Photoinhibition.* **BMC Plant Biol**. *2009 Jun 9;9:71.*

13. Li Z., Ahn T.K., Avenson T.J., **Ballottari M**., Cruz J.A., Kramer D.M., Bassi R. ,Fleming G.R., Keasling J.D., Niyogi K.K. *Lutein accumulation in the absence of zeaxanthin restores nonphotochemical quenching in the Arabidopsis thaliana npq1 mutant.* **Plant Cell.** 2009 Jun;21(6):1798-812.

14. Schlau-Cohen G.S., Calhoun T.R., Ginsberg N.S., Read E.L., **Ballottari M.,** Bassi R., van Grondelle, Fleming G.R. *Pathways of Energy Flow in LHCII from Two-Dimensional Electronic Spectroscopy.* **The Journal of Physical Chemistry B** 2009 Nov 19;113(46):15352-63.

15. Calhoun T.R., Ginsberg N.S., Schlau-Cohen G.S., Cheng YC, **Ballottari M.,** Bassi R., Fleming G.R. *Quantum Coherence Enabled Determination of the Energy Landscape in light-harvesting complex II.* **The Journal of Physical Chemistry B** 2009 Dec 24;113(51):16291-5

16. Schlau-Cohen GS, Calhoun TR, Ginsberg NS, **Ballottari M**, Bassi R, Fleming GR. *Spectroscopic elucidation of uncoupled transition energies in the major photosynthetic light-harvesting complex, LHCII.* **Proc Natl Acad Sci U S A.** 2010 Jul 27;107(30):13276-81.

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PATENTS

- Patent application n. 102021000027824 and PCT/IB2022/060381 "MODIFIED β-CAROTENE KETOLASE (BKT), CORRESPONDING NUCLEIC ACID AND MICROALGAE STRAIN COMPRISING THE SAME"
- Patent n. 812020000210221 (granted at national level) and PCT/IB2021/059969 " Mutant strain of the seaweed Nannochloropsis and method of production of the same, its use in the production of Astaxanthin and Omega-3 and related compositions"

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