## PERSONAL INFORMATION

**Patrizia Casella**

Affiliation ENEA (Italian National Agency for New Technologies, Energy and Sustainable Economic Development), Department for Sustainability (SSPT), Division Biotechnologies and Agroindustry, Bioproducts and Bioprocesses laboratory

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**CURRENT POSITION** Level III Researcher

**RESEARCH FIELD** Production and quantification of high-value compounds from microorganisms and agro-food by-products

## WORK EXPERIENCE

from 10/05/2021 – to present

### Researcher

ENEA, Department for Sustainability (SSPT),Division Biotechnologies and Agronidustry, Laboratory Bio-products and Bio-processes, https://bioagro.sostenibilita.enea.it/en/structure/probio, Piazzale Enrico Fermi, 1, 80055, Portici (NA)

- Succinic acid production by using lignocellulosic biomasses: improvement of fermentation process by succinic producers bacteria. Analytical quantification of succinic acid, and others compounds by uHPLC-DAD.
- Optimization of methodology for the detection and quantification of high value compounds (vitamins, phenolic compounds, sugars) contained in agroindustrial by-products (milk whey, concentrate and permeate from nano- and ultrafiltration membrane system, brewer's spent grain). Experimental activity on the optimization of analytical methods for the quali-quantitative analysis has been performed by ultra-high performance liquid chromatography (uHPLC) using a diode detector (DAD) and an evaporative light scattering detector (ELSD). The activity is carried out within the European project PROVIDE (Protein and biomolecules sources for nutritional security and biodiversity of bakery products in a circular food system) https://www.project-provide.eu;
- Participation in the project BAIAS "Biofuels, Integrated Environmental Authorization and Sustainable Industrial Areas, collaboration agreement between MiTE and ENEA. The activity has been carried out on the study and evaluation of the composition of residual matrices of the agro-food and agricultural sector, and microalgae for the production of biofuels (biomass to liquid BTL) and the census of the current plants located in Europe and industrial scale highlighting the technologies and the type of feed (input material);
- Collaboration in the drafting of project proposals under various European research programs such as Horizon Europe, PRIMA research program, and under the PNRR;
- Collaboration in the drafting of the position paper on decarbonization of agri-food systems in the context of the National Agrifood Cluster CL.A.N. (https://clusteragrifood.it) in which ENEA participates as a partner.

from 16/09/2015 – to 31/03/2021

### Research post-doc fellow

ENEA, Department for Sustainability (SSPT),Division Biotechnologies and Agronidustry, Laboratory Bio-products and Bio-processes, https://bioagro.sostenibilita.enea.it/en/structure/probio, Piazzale Enrico Fermi, 1, 80055, Portici (NA)

- Research activities on microalgae cultivation of the species *Scenedesmus almeriensis* and *Haematococcus pluvialis* in an indoor photobioreactor facility, optimization of growth parameters, in order to evaluate $CO_2$ sequestration and the effect of water and nutrient reuse on the production of carotenoids and polyunsaturated fatty acids (omega-3) for application as food additive, ingredients in nutraceuticals and cosmetic products;

- Research activities and optimization on innovative technologies (pressurized fluid extraction) for the extraction of high value bio-based products (carotenoids and polyunsaturated fatty acids) by testing GRAS solvent;
- Characterization of chemical composition (proteins, aminoacids, carbohydrates, sugars, Total dietary fibers, lipids, fatty acids methyl ethers, organic acids) of microalgae biomass, fermented broths, extracts from pressurized and supercritical $CO_2$ extraction ($CO_2$-SFE).

from 26/09/2012 – to 30/06/2015

### Research post-doc fellow

ENEA, Department for Sustainability (SSPT), Via Martiri di Monte Sole, 4, 40129, Bologna

- Evaluation of the Biochemical Methanation Potential (BMP) of sludge from a UASB reactor for the treatment of wastewater from potato processing, and fed with different test substances (corn silage);
- Technical support and collaboration within the Methan Tube project for the development of an innovative biotech system for the measurement of methanation processes by measuring and simulating the real condition of a anaerobic digestion plant. Current patent n°832 Methan Tube ®, ENEA owner and Biological Care company (www.biologicalcare.it), co-owner for 80%;
- treatment of removal of inorganic load (nitrogen and phosphorus) from wastewater through the use of algal biomass, recovery and valorization of the biomass.

## EDUCATION AND TRAINING

from 01/01/2019 – to 31/12/2011

### PhD in Ecology and Management of Biological Resources

University of Tuscia, Faculty of Science MM. FF. NN., Department of Ecological and Biological Sciences (DEB), Largo dell'Università, 01100 Viterbo

▪ Methodology to study the functionality of microbial community in sediments river and marine water

from January 2010

### Professional qualification to Biologist

University of Messina, Faculty of Science MM. FF. NN., Viale Ferdinando Stagno d'Alcontres 31, 98166 Messina

from 01/09/2006 – to 28/07/2008

### Master degree in Biology and Ecology of the Coastal Marine Environment

University of Messina, Faculty of Science MM. FF. NN., Viale Ferdinando Stagno d'Alcontres 31, 98166 Messina

▪ Ecology, microbiology, molecular biology, ecotoxicology

from 01/09/2003 – to 26/07/2006

### Bachelor degree in Marine Biology and Ecology

University of Messina, Faculty of Science MM. FF. NN., Viale Ferdinando Stagno d'Alcontres 31, 98166 Messina

▪ botany, zoology, physiology, inorganic and organic chemistry, biochemistry, mathematics and physics

from 01/09/1998 – to 09/07/2003

### Upper secondary education

Scientific High School "Archimede", V.le Reg. Margherita, 3, 98121 Messina

▪ math, physics, Latin, Italian, English, French, Spanish, biology, physics, chemistry, history, philosophy

## PERSONAL SKILLS

Mother tongue: Italian

Other languages: English Level B2, Level 1 Certificate in Esol International (Spoken) (Communicator B2) 500/1775/5 obtained on 02 November 2012, City and Guilds. Level 1 Certificate in Esol International (reading, writing, and listening) (Communicator B2) 500/1765/2, obtained on 26 October 2012, City and Guilds.

## ADDITIONAL INFORMATION

Publications and main indexes

Total number of publications in peer-review journals: 45
H-Index: 16
Scopus: https://www.scopus.com/authid/detail.uri?authorId=56087957200
Publons: https://publons.com/researcher/1576879/patrizia-casella/
ORCID: https://orcid.org/0000-0001-7683-4317

**Relevant publications for the call**

1) Marino T., Leone G. P., **Casella P.**, Iovine A., MusmarraA D., Zoani C., Balducchi R., Molino A. Green Extraction of Microalgae Components for Incorporation in Food and Feed Supplements. Chemical Engineering Transactions 87 (2021): 457-462.
2) **Casella P.**, Iovine A., Mehariya S., Marino T., Musmarra D., Molino A. Smart method for carotenoids characterization in *Haematococcus pluvialis* red phase and evaluation of astaxanthin thermal stability. Antioxidants 9, 5 (2020): 422.
3) Molino A., Larocca V., Di Sanzo G., Martino M., **Casella P.**, Marino T., Karatza D., Musmarra D. Extraction of bioactive compounds using supercritical carbon dioxide. Molecules 24, 4 (2019): 782.
4) Molino A., Iovine A., **Casella P.**, Mehariya S., Chianese S., Cerbone A., Rimauro J., D. Musmarra. Microalgae characterization for consolidated and new application in human food, animal feed and nutraceuticals. International journal of environmental research and public health 15, 11 (2018): 2436.
5) Molino, A., Larocca V., Valerio V., Martino M., Marino T., Rimauro J., **Casella P.**. Biofuels and bio-based production via supercritical water gasification of peach scraps. Energy & Fuels 30, 12 (2016): 10443-10447

**Presentations at conferences**

1) **Casella P.**, Marino T., Iovine A., Larocca V., Balducchi R., Musmarra D., Molino A. Optimization of lutein extraction from *Scenedesmus almeriensis* using pressurized liquid extraction. Icheap15. The 15th International Congress on Chemical and Process Engineering. Virtual conference. 23-26 May 2021.
2) **Casella P.**, Rimauro J., Iovine A., Mehariya S., Musmarra D., Molino A. Characterization of extracts from *Haematococcus pluvialis* red phase by using Accelerated solvent extraction. Icheap14. The 14th International Congress on Chemical and Process Engineering. Bologna (Italia) 26-29 May 2019.
3) Iovine A., Cerbone A., Mehariya S., Musmarra D., **Casella P.**, Molino A. Effect of mechanical pretreatment on *Nannochloropsis gaditiana* on the extraction of omega-3 by using accelerated extraction solvent technology. Icheap14. The 14th International Congress on Chemical and Process Engineering. Bologna (Italia) 26-29 May 2019.
4) Molino A., **Casella P.**, Balducchi R., Iovine A., Karatza D., Ferraro A., Musmarra D., Hristoforou E. Il progetto VALUEMAG: dalle microalghe ai macro benefici per la salute umana. Terza Edizione Mostra-convegno internazionale dedicata interamente all'Acquacoltura, Algocoltura, Molluschicoltura e Industria della pesca. AquaFarm 2019. Pordenone (Italia) 13-14 February 2019.
5) Mehariya S., Molino A., Iovine A., **Casella P.**, Chianese S., Musmarra D. Biochemical conversion of $CO_2$ for cultivation of micro-algae and production of high value-added chemicals. 59th Annual International Conference of Association of Microbiologists of India and International Symposium on Host Pathogen Interaction. Hyderabad (India), 9-12 December 2018.
6) Molino A., **Casella P.**, Rimauro J., CerboneE A., Iovine A., Mehariya S., Scamardella D., Hristoforou E., Karatza D., Chianese S., Musmarra D. Lutein production via carbon dioxide sequestration from *Scenedesmus almeriensis* microalgae. Fifth International Symposium on Green Chemistry, Sustainable Development, and Circular Economy. Skiathos, Greece, 30 settembre-3 November 2018. ISBN:978-618-5271-61-9.

**Main projects with interest for the call (last 5 years)**

- AGRITECH - Agritech - "National Research Centre for Agricultural Technologies" allo Spoke 8 "New models of circular economy in agriculture through waste valorization and recycling" funded by National Recovery and Resilience Plan (PNRR) and granted by the European Commission's NextGeneration EU programme
- SUS-MIRRI.IT "Strengthening the MIRRI Italian Research Infrastructure for Sustainable Bioscience and Bioeconomy" funded by National Recovery and Resilience Plan (PNRR) and granted by the European Commission's NextGeneration EU programme.
- ON-FOODS funded by National Recovery and Resilience Plan (PNRR)
- VALUEMAG (Valuable Products from Algae Using New Magnetic Cultivation And Extraction Techniques) project; ID Grant: 745695, Funding: Bio-Based Industries Joint Undertaking (BBI-JU); Call: BIO BASED INDUSTRIES PPP (H2020-BBI-JTI-2016) Exploiting algae and other aquatic biomass for production of molecules for pharma, nutraceuticals, food additives and cosmetic applications, budget: 813750 €.

**Memberships and managerial activities**

Topical Advisory Panel Member of International Journal of Environmental Research and Public Health (MDPI, impact factor 3,390)
Guest Associate Editor of Research Topic " Advances in Biotechnology and Processes for the Bioeconomy" in Biochemical Enginnering Journal of Frontiers

Date 01/04/2023

Signature (holographic format) Patrizia Casella