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1) Education (University of Milan Bicocca - UNIMIB)

2021: PhD in Converging Technologies for Biomolecular Systems (TeCSBi) Excellent with honors
Microbial cell factories for biobased processes: the concept of cascading applied to different biomasses and bioproducts in the context of bioeconomy

2014: Master's Degree in Industrial Biotechnology 110/110 cum laude

Pab1 and mRNA metabolism in Saccharomyces cerevisiae: isolation and characterization of industrial interest mutants

2012: Bachelor's Degree in Biotechnology 110/110 cum laude

Engineering of S. cerevisiae for co-fermentation of xylose and cellobiose from lignocellulose hydrolysate for the production of second-generation bioethanol

2) Work experience in scientific research

From 2023 Assistant Professor (Fixed-term researcher type A – RTDa) in Fermentation chemistry and industrial biotechnology at the UNIMIB and National Biodiversity Future Center (NBFC)

2022-2023 Research grant (type B) at the UNIMIB

Post-doctoral researcher grant “Ingegnerizzazione microbica per la produzione di metaboliti secondari di origine vegetale e sviluppo di un bioprocesso industriale” for the CHIM/11 area under the supervision of Prof. Paola Branduardi.

2021 – 2022 Research fellowship from Consorzio Interuniversitario Nazionale per la Scienza e Tecnologie dei Materiali (INSTM)

“Implementazione dell’uso di lieviti oleaginosi per la produzione di molecole lipidiche di rilevanza industriale” to be performed at UNIMIB under the supervision of Prof. Paola Branduardi

2021 Research fellowship from Consorzio Interuniversitario Nazionale per la Scienza e Tecnologie dei Materiali (INSTM)

“Utilizzo di biomasse residuali per la produzione di lipidi di interesse industriale mediante l’uso di lieviti oleaginosi” to be performed at the UNIMIB under the supervision of Prof. Paola Branduardi

2021 Occasional employment contract at UNIMIB (cod. 21CE102)

“Valorizzazione di residui vegetali e animali attraverso bioprocessi basati su fermentazioni microbiche” for the CHIM/11 area under the supervision of Prof. Paola Branduardi.

2020 – 2021 Occasional employment contract at UNIMIB (cod. 20CE231)

“Sfruttamento e valorizzazione dei prodotti di scarto animale e agricolo dallo sviluppo di processi biotecnologici sostenibili basati su fabbricazione di cellule microbiche” for the CHIM/11 area under the supervision of Prof. Paola Branduardi.

2019 Visiting PhD candidate at the Faculty of Technology of the University of Oulu, Finland

Visit sponsored by the European Institute of Innovation & Technology (EIT) Raw Materials project ADMA2: Practical training between Academia and Industry during doctoral studies. Period under the supervision of Prof. Mika Ruusunen.

2017 – 2020 Research Fellowship at UNIMIB (cod. 17B139)

“Development of sustainable biotechnological processes for the valorization of agricultural and animal waste products” for the CHIM/11 area under the supervision of Prof. Paola Branduardi. -

2014 – 2017 Researcher for Galatea Biotech Srl, spin-off of UNIMIB

From 2017 Freelance science communicator, content creator, scientific writer, book author.

3) Scientific career

My scientific career is mainly devoted to the knowledge of different aspects of biorefineries based on microbial cell factories, with the goal to detach from fossil resources in terms of energy and materials. Throughout the years of experience in research I had the opportunity to work on several projects focusing on topics that are part of biorefinery technologies and their applications, from bioprospecting and synthetic biology, to computational modelling and bioreactors. The concept of cascading and its application in different bioprocesses has been key part of my research activity, as stated in the title of my PhD thesis (section 1) The use of biomasses of residual origin and their valorization by the use of microbial cell factories are additional elements I had focused on, fitting my experience in the broader bioeconomy and sustainability scenario. Those topics have also been the driving factors to my educational activities at the academic level, as described in section 5. In addition, my science communication, dissemination and outreach activity (sections 10, 12, 17), both at the academic (section 5) and freelancer level (section 19), permitted me to expand the network of contacts outside of the closer bubble of the sector, involving stakeholders, such as policymakers and social actors. This peaked with the role of EU Bioeconomy

Youth Ambassador assigned me by the European Commission in 2022 (section 4) and the subsequent involvement at the Bioeconomy Congress in Brussels (section 14).

4) Awards and honors

2024: Premio Atlante from Circolo dei Lettori di Torino – Narrative section for “Quello che sai sulla plastica è sbagliato”
2023: Young Talents Award from the University of Milano Bicocca
From 2022: EU Bioeconomy Youth Ambassador – European Commission
2020: De Paoli Marchetti Award for Science Communication from the Union of Italian Scientific Journalists (UGIS)
Best poster award at the International Forum on Industrial Biotechnologies (IFIB) 2020
Best oral presentation among PhD candidates in Converging Technologies for Biomolecular Systems (TeCSBi)
Bursary for the congress Microbial Stress 2020 by the European Federation of Microbiological Societies (FEMS)
Bursary form the COST Action CA18229 - non-conventional yeasts for the production of bioproducts (YEAST4BIO) for a Short-Term Scientific Mission at the University of Tartu (Estonia) under the supervision of Prof. Petri-Jaan Lahtvee
2019: National Finalist for Famelab Italy 2019
2017: First Prize of the National Award for Science Communication (Premio Nazionale di Divulgazione Scientifica) of the Italian Book Association for Under 35 category with “Geneticamente modificati - Viaggio nel mondo delle biotecnologie”.
Finalist in 2019, 2020 and 2021 editions with articles and books.

5) Educational experiences and positions

From 2024: Professor for the course “Industrial Microbiology laboratory” of the at the bachelor’s course in Biotechnology UNIMIB
From 2024: Lecturer for the Department of Chemistry and Industrial Chemistry of University of Pisa
From 2024: Professor for Master in Comunicazione Scientifica – Make it so
From 2024: Lecturer for Collegio delle Università Milanesi – Science communication series – “Social media for researchers”
From 2022: Lecturer for the *Science, communication and social media* course led by Prof. Valeria Cappelli at the MS program in *Biotechnologies for Food Science* at the University of Padua.
From 2022: Lecturer for the *Science Communication and Dissemination* course for PhD students of the European School of Molecular Medicine (SEEM) organized by Fondazione Umberto Veronesi.
From 2022: Lecturer for the course in *Science Communication* of the Department of Physics of University of Pavia
From 2022: Professor for Edulia, Massive Online Open Course from Treccani, on the topic of biotechnology
From 2021: Professor for the Master in Nutrition and Applied Dietetics of the Department of Medicine of UNIMIB
From 2020: Lecturer for the course in *Developing soft skills in science: case-studies from microbial biotechnology* led by Prof. Francesca Mapelli for the MS program in *Biotechnology for the Bioeconomy* of the University of Milan.
2020: Professor for the course One health food (Food for prevention and well-being in Covid-19 era) of UNIMIB
2020: Lecturer for the Enzyme Engineering and Structural Biology group of the Denmark Technical University (DTU)
2020: Organizing committee of the 2020 edition of BtBs Day, dedicated to the Department of Biotechnology and Biosciences of UNIMIB.
From 2017: Subject matter scholar for the course Industrial Processes and Biorefineries at the bachelor’s course in Biotechnology UNIMIB led by Prof. Paola Branduardi.

6) Thesis supervisor

a) Master’s students in Industrial Biotechnology

2024: Matilde Dameri “Sviluppo di bioraffinerie microbiche basate sulla valorizzazione di biomasse residuali per la produzione di carotenoidi e precursori farmaceutici”

Sara Grassi “Generation of a *Pseudomonas putida* strain growing on methanol via the ribulose monophosphate cycle”

Samuele Mariani “Determinazione di un metodo di sintesi industriale per la produzione di ceramidi”

b) Bachelor’s students in Biotechnology

2024: Linda Sandrina Consolanti “Biosintesi di eugenolo e allilfenoli in *E. coli* usando il pathway CAR-dipendente”
Sebastiano Aresi “Ingegnerizzazione di *Pichia pastoris* per l'espressione eterologa e caratterizzazione di una lipasi di *Cordyceps militaris*”

Marta Formenti “Fondi di caffè esausti come substrato per la produzione di alcolici: fermentazione con *T. delbrueckii* e *P. kluyveri* ed effetto degli estratti di lievito

Federico Fox “Valorizzazione di scarti alimentari per la produzione di PHB tramite un ceppo ingegnerizzato di *Halomonas bluephagenesis*”

2023: Giovanni Bernardini “Biosintesi ricombinante di berberina e alcaloidi alogenati in *Saccharomyces cerevisiae*”

6a) Thesis co-supervisor

c) Master’s students in Industrial Biotechnology

2020: Chiara Cantù “Produzione di carotenoidi mediante biomasse residuali lignocellulosiche”

d) Bachelor’s students in Biotechnology

2022 – Sara Grassi “Ottimizzazione della crescita su D-xilosio per la produzione di isobutanolo da parte di *S. cerevisiae* attraverso evoluzione adattativa in laboratorio e ingegneria razionale”

2019 – Mariachiara Nova “Sviluppo di un biosensore per *Vibrio cholerae* utilizzando un sistema di quorum sensing in *E. coli* ricombinante”

2018 – Miryam Bernardi “Dal tutolo al butanolo: viaggio di un bioprocesso consolidato”

2018 – Jacopo Gobatto “Microalga *Chlorella* sp. C2 per lo smaltimento di scarti industriali accoppiato alla produzione di biocarburanti”

2017 – Luca Mastella “Overespressione del gene DGAT2 per la produzione di triacilgliceroli in *Neochloris oleoabundans*”

2016 – Pietro Bertolotti “Utilizzo di consorzi sintetici per la produzione di molecole di interesse industriale”

7) Affiliations

From 2024: Part of third mission team of the Department of Biotechnology and Biosciences of UNIMIB

From 2023: Researcher for the National Biodiversity Future Center (NBFC)

From 2023: Advisory Board Member of ShapingBio project

From 2018: Member of Bicocca cEnter of Science and Technology for FOOD (BEST4FOOD)

Member of the Italian Society of General Microbiology and Microbial Biotechnology (SIMGBM)

2015: Founder Member of BicoccaAlumni, association of former students from UNIMIB

8) Research programs

2023: National Biodiversity Future Center (NBFC)

2019: European Institute of Innovation & Technology (EIT) Raw Materials project ADMA2: Practical training between Academia and Industry during doctoral studies

2018: Food Social Sensor network (Food NET)

2017: Sistemi Alimentari e Sviluppo Sostenibile (SASS)

2016: Cariplo project MYSUSHI (Microalgae and Yeasts SUSTainable fermentation for HIGH quality fish feed formulation)

9) Scientific publications (*co-first authors)

- 1) EU Bioeconomy Youth Ambassadors, Bartmann, R., **Bertacchi, S.**, Bifone, M., Ciantar, H., Cogley, D., Dirdaite, U., Escórcio, R., Jögi, K., Lázár, J., Mrozinski, O., Nachtergaele, P., Schabert, P., Sciotti, C., Werl, C., & Zaitseva, D. (2024). Bioeconomy Youth Vision. European Youth Portal, European Union. https://youth.europa.eu/get-involved/sustainable-development/whats-youth-visionbioeconomy_en
- 2) Magoni*, C., **Bertacchi***, S., Giustra, C. M., Guzzetti, L., Cozza, R., Ferrari, M., Torelli, A., Marieschi, M., Porro, D., Branduardi, P., Labra, M. (2022). Could microalgae be a strategic choice for responding to the demand for omega-3 fatty acids? A European perspective. Trends in Food Science & Technology.
- 3) Ceccotti, C., Bruno, D., Tettamanti, G., Branduardi, P., **Bertacchi, S.**, Labra, M., Rimoldi, S., Terova, G. (2022). New value from food and industrial wastes – Bioaccumulation of omega-3 fatty acids from an oleaginous microbial biomass paired with a brewery by-product using black soldier fly (*Hermetia illucens*) larvae. Waste Management, 143, 95-104.
- 4) Interdependence between lignocellulosic biomasses, enzymatic hydrolysis and yeast cell factories in biorefineries. **Bertacchi***, S., Jayaprakash*, P., Morrissey J.P., Branduardi P. (2021). Microbial Biotechnology, Wiley.
- 5) Mathematical Analysis and Update of ADM1 Model for Biomethane Production by Anaerobic Digestion. **Bertacchi S.**, Ruusunen M., Sorsa A., Sirviö A., Branduardi, P. (2021). Fermentation, 7(4), 237, MDPI.
- 6) Optimization of Carotenoids Production from *Camelina sativa* Meal Hydrolysate by *Rhodospiridium toruloides*. **Bertacchi S.**, Cantù C., Porro D., Branduardi P. (2021). Fermentation, 7(4), 208, MDPI.
- 7) Camelina sativa meal hydrolysate as sustainable biomass for the production of carotenoids by *Rhodospiridium toruloides*. **Bertacchi S.**, Bettiga M., Porro D., Branduardi P. (2020). Biotechnology for biofuels, 13(1), 1-10, Springer.
- 8) Enzymatic Hydrolysate of Cinnamon Waste Material as Feedstock for the Microbial Production of Carotenoids. **Bertacchi S.**, Pagliari S., Cantù C., Bruni I., Labra M., Branduardi P. (2021). International journal of environmental research and public health, 18(3), 1146, MDPI.
- 9) Using Glycerol to Produce European Sea Bass Feed with Oleaginous Microbial Biomass: Effects on Growth Performance, Filet Fatty Acid Profile, and FADS2 Gene Expression. Terova G., Moroni F., Antonini M., **Bertacchi S.**, Pesciaroli C., Branduardi P., Labra M., Porro D., Ceccotti C., Rimoldi, S. (2021). Frontiers in Marine Science, 8, 715078.
- 10) RRI approach for development and acceptance of novel fish feed formulations in aquaculture. Magoni C., Campanaro A., Galimberti A., Pesciaroli C., **Bertacchi S.**, Branduardi P., Labra M. (2018). In Governance and sustainability of responsible research and innovation processes (pp. 65-70). Springer.
- 11) The *Saccharomyces cerevisiae* poly (A) binding protein (Pab1): Master regulator of mRNA metabolism and cell physiology. Brambilla M., Martani F., **Bertacchi S.**, Vitangeli I., Branduardi P. (2019). Yeast, 36(1), 23-34, Wiley.
- 12) The *Saccharomyces cerevisiae* poly (A) binding protein Pab1 as a target for eliciting stress tolerant phenotypes. Martani, F., Marano, F., Bertacchi, S., Porro, D., & Branduardi, P. (2015). Scientific reports, 5(1), 1-13.

10) Books

- 1) Oct 2023: Angioni S., **Bertacchi S.**, Rollini R. Quello che sai sulla plastica è sbagliato. Gribaudo 8858046935

- 2) Dec 2021: **Bertacchi S.** 50 grandi idee - Biotecnologie. Edizioni Dedalo, ISBN 8822069048
- 3) Feb 2021: **Bertacchi S.** Piccoli geni – Alla scoperta dei microrganismi. Hoepli Editore, ISBN 8820399962
- 4) Dec 2020: Pistore G., Brusaferrò S., Ricciardi W., Villa R., Galassi F.M., Cartabellotta N., Di Grazia S. Cossarizza A., Silenzi A., Gorini G., **Bertacchi S.** Il Virus che non Esisteva: Un viaggio nella Scienza che ci tirerà fuori da questa situazione (2020) ISBN 979-8584657772
- 5) May 2017: **Bertacchi S.** Geneticamente modificati - Viaggio nel mondo delle biotecnologie. Hoepli Editore, ISBN 9788820379834

11) Patents

- 1) Process for cellular biosynthesis of poly d-lactic acid and poly l-lactic acid. Porro D., Branduardi P., **Bertacchi S.**, Berterame N.M. WO2020025694A1

12) Columns in magazines and newspapers

From 2022: Equilibri Magazine – Fondazione Enrico Mattei – focus on biotechnology and bioeconomy

From 2022: Sapere – Edizioni Dedalo – “Biotecno-che?” focus on biotechnology

From 2022: Radar Magazine – “Storie su busta” focus of philately, science and history from the point of view of stamp collecting

From 2019: Macplas – magazine of the plastic and rubber industry – focus on bioplastics and biodegradation of rubber

13) Reviewer activity

Reviewer for international peer-reviewed journals: EFB Bioeconomy Journal, Biotechnology for Biofuels and Bioproducts (IF 7.670), Journal of Environmental Management (IF 8.91), Microbial Cell Factories (IF 6.352), Chemical Engineering Journal Advance (IF 3.6), Microorganisms (IF 4.926), Applied Microbiology and Biotechnology (IF 5.56)

14) Scientific conferences and events as speaker

2024: Workshop “Bioeconomy education to enable the transition to a competitive, regenerative, and fair (bio)economy. Building the next Union of Skills in the bioeconomy” – European Commission (Brussels)

European Summit on Industrial Biotechnology (ESIB24) – Graz (Austria)

BTechPro24! – Riga (Latvia)

Bioeconomy Changemaker Festival – European Commission (Brussels)

La Salute è Verde / Il Verde è Salute. Economia verde, paesaggio e salute: criticità, prospettive e proposte per lo sviluppo delle città

2022: SIMEI 2022 – Millevigne – round table “From waste to resources” in the context of winemaking.

Bioeconomy conference (European Commission, Brussels) – introduction to the session *Bioeconomy for a greener and more resilient EU bioindustry* as EU Bioeconomy Youth Ambassador

2021: Microbiotec '21 – Congress of Microbiology and Biotechnology (Lisbon)

Biotech – a better future, organized by Assobiotech Federchimica (Rome)

EIT Raw Materials joint seminar of projects RAISEE and ADMA2 (Online)

2019: World Usability Day 2019 at Microsoft House – focus on biotechnology (Milan)

Local Conference of Youth (LCOY) on Climate Change Italy – focus on plant biotechnology (Florence)

2017: Pharmahub Biotech – focus on synthetic biology (Milan)

15) Scientific conferences and events as participant

2024: International Forum on Industrial Biotechnology (IFIB24) - Bologna

Forum Nazionale della Biodiversità 2024 - Palermo

ShapingBio cross-sectoral collaboration workshop no.2 - Frankfurt

Final meeting Oleoform - IMDEA Energy Institute (Madrid)

Final Open Meeting Yeast4Bio (Y4B) - IMDEA Energy Institute (Madrid)

2023: XXXIV SIMBGM Congress - Cagliari

8th Physiology of Yeasts and Filamentous Fungi (PYFF8) - organized by EFB at University College Cork (Ireland)

2021: European Federation of Biotechnology (EFB) congress (Online)

2020: Microbial Stress 2020 congress organized by FEMS (Online)

International Forum on Industrial Biotechnologies 2020 (IFIB2020)

2019: EIT Raw Materials and EIT Digitals-networking event (Oulu, Finland)

Winter School of Science and Technology Entrepreneurship Promotion (STEP) at UNIMIB

B Corp Italian Summit 2018 at Fondazione Golinelli (Bologna)

7th Congress on Physiology of Yeasts & Filamentous Fungi 2019 (PYFF7) organized by EFB at UNIMIB

Doctoral School in Yeast Industrial Biotechnology - Translating biotechnology research from academia to industry organized by YEASTDOC (Berlin)

Doctoral School in Yeast Industrial Biotechnology - Knowledge Transfer Workshop organized by YEASTDOC (Berlin)

2018: 9th International Forum on Food and Nutrition – organized by Barilla Center for Food and Nutrition

International Autumn School “From waste to microalgae: an example of circular economy” (Gargnano, BS).

Industrial Synthetic Biology Congress (Munich)

- International Summer School “Towards a bio-based economy” – II edition at UNIMIB
Plast 2018– International Fair of Plastic and Rubber Materials (Milan)
- 2017: 8th International Forum on Food and Nutrition – organized by Barilla Center for Food and Nutrition
Circular Bioeconomy Arena Meeting by Assobiotech, SPRING (Italian Cluster of Green Chemistry), LGCA (Region Lombardy Cluster of Green Chemistry), Intesa Sanpaolo Start-Up Initiative
Aquafarm 2017 (Pordenone)
- 2015: 2nd European Summer School on Industrial Biotechnology (ESSIB 2015) (Stuttgart)

16) Outreach and science communication conferences and events as speaker

- 2024: Frontiere del sapere (Precenico UD) – focus on biotechnology
Pomeriggi della biblioteca (Nerviano MI) – focus on biotechnology
Una sola Terra festival (Brescia) – focus on plastics
USiena School of Pharmacy Society event (Siena) – focus on plastics
Lecture BioDiverse (Udine) – focus on plastics and biodiversity
A cena con la scienza (Castelnuovo Fogliani PC) – focus on microbiology
Food and Science Festival 2024 (Mantua) – focus on plastics and bioplastics
Co.Scienza Festival 2024 – Trento – focus on plastics and bioplastics
Symposium SAV.NO (Vittorio Veneto TV) - focus on biotechnology
OrvietoScienza (Orvieto TR) – focus on biotechnology
- 2023: Ecomondo 2023 (Rimini) – focus on bioeconomy
CICAP Fest 23 (Padua) – focus on plastics and bioplastics
BioTopics23 (Bergamo) – focus on biotechnology
Wired Next Fest (Milano) – focus on plastics and bioplastics
TedX Castelfranco Veneto – focus on biotechnology
Food and Science Festival 2023 (Mantua) – focus on bioeconomy
Symposium S.E.S.A. – Este (PD) – focus on biotechnology
Co.Scienza Festival 2023 – Trento – focus on biotechnology
- 2022: BookCity 2022 - Milano
Food and Science Festival 2022 (Mantua) – focus on biotechnology
Strambinaria (Strambino, TO) – focus on the third mission of the University
CICAP Fest 22 (Padua) – focus on biotechnology
Workshop for Agrofarma (Morimondo, MI) - focus on science communication
Panelist for Save the Children Italia - focus on bioeconomy (online)
Panelist for Fondazione Telethon - focus on red biotechnology (online)
Scienza e Virgola (Trieste) – focus on biotechnology
- 2021: Scientific Festival of Alto Vicentino (Schio) – focus on microbiology
Food and Science Festival 2021 (Mantua) – focus on cheesemaking and microbiology
Eta Beta – RAI Radio 1 (Online) – focus on gene editing and CRISPR/Cas9
Diversimili – the Biodiversity Festival (Udine) – focus on food microbiology and biotechnology
Italian Association for Cancer Research (AIRC) – why is the microbiota important for health? (Online)
Strambinaria (Strambino, TO)
- 2020: Food and Science Festival 2020 (Mantua) – focus on yeasts
National Geographic Italy - 50th Earth Day – focus on microbiology (Online)
- 2018: BookCity Milano – focus on biotechnology (Milan) – focus on biotechnology
Raw Materials University Day (Milan)
Scienza in Vetta (Courmayeur)
Food and Science Festival 2018 (Mantua)
Emozioni dal Mondo – Merlot and Cabernet together, congress on winemaking (Bergamo)
Pint of Science 2018 – focus on yeasts (Milan)
Darwin Day 2018 – focus on GMOs (Milan)
- 2017: Giovedì Scienza XXXIII Edition – focus on bioplastics (Turin)

17) Science communication activity

- From 2022: Content creator for Italian Association of Cancer Research (AIRC), Telethon Italy and Italian Society of Agronomy (SIA)
- From 2021: Scientific writer for Mondadori Group, focusing on scientific contents for high-school students
- From 2017: Social media strategist for the Food & Science Festival, held in Mantua, Lombardy
- From 2016: Social media science communicator (e.g. 23k followers on Instagram)
- 2012-2016: Scientific editor for Oilproject (now WeSchool) the biggest Italian online school

18) Language

- Italian: Mother tongue
English: Level C1 Reading, Speaking, Listening