

EUROPEAN
CURRICULUM
VITAE FORMAT



PERSONAL INFORMATION

Name Flavia Marinelli
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Nationality Italian
Date of Birth [REDACTED]

PUBLICATIONS

Total number of publications in peer-review journals: 117
Total number of citations: 3186 (Scopus) 4784 (Google Scholar)
H index: 31 (Scopus) 39 (Google Scholar)

FIELD OF INTEREST

The main research interests can be summarized as follows:

(i) Discovery, production, and characterization of novel antibiotics produced by filamentous actinomycetes, by applying both activity-based screenings and genome mining. These include four patented biomolecules: two inhibiting protein synthesis and mRNA transcription, two interfering with bacterial cell wall synthesis (see below for details).

(ii) Study of novel isolation, cultivation, and screening methods to be applied to microbial producers of specialized metabolites. As an example, methods for the isolation of novel species of actinomycetes and fungi from Antarctic mats, of myxobacteria from arid environments, and of cyanobacteria from biomasses, have been developed. The isolation phase is then followed by the implementation of fermentation procedures for microbial growth and antibiotic production at flask and/or bioreactor scale, with particular focus on the fermentation processes for the production of glycopeptide antibiotics (teicoplanin and A40926).

(iii) Study of polyphasic taxonomy and genetic manipulation methods of antibiotic-producer filamentous actinomycetes.

(iv) Study of the biosynthesis of glycopeptide antibiotics, their biosynthetic gene clusters, their regulation and self-resistance mechanisms, also as tools for improving their production.

(v) Study of nanoformulations of glycopeptide antibiotics and of alternative infection models, based on insect larvae, for screening and characterization of free and nano-conjugated glycopeptide antibiotics.

(vi) Screening of cultivable microorganisms and metagenomic libraries for the identification of enzymes of biotechnological interest, for modification of antibiotics and other biomolecules of pharmaceutical interest, for biomass conversion, and for biocontrol strategies against fungi and insects.

(vii) Study and optimization of homologous (in actinomycetes and fungi) and heterologous expression (in *Escherichia coli* and streptomycetes) of enzymes involved in antibiotic biosynthesis and regulation, or in chitin degradation.

WORK EXPERIENCE

- Dates (from - to) 2017 → present
- Name / address employer University of Insubria, Department of Biotechnology and Life Sciences, via JH Dunant 3, 21100 Varese (Italy)
- Type of business or sector Academic
- Occupation or position held **Full professor of Microbial Biotechnology**
- Activities & responsibilities Research activities in the field of microbial biotechnology, fermentation, and molecular biology of microorganisms of industrial relevance, including producers of antibiotics, proteins, and peptides with biological activity. Teaching activities for the Bachelor Degree in Biotechnology (Microbial Biotechnology) and for the Master Degrees in Biotechnology for the Biobased and Health Industry and Molecular and Industrial Biotechnology (Pharmaceutical Biotechnology, Biorefineries)

- Dates (from - to) 2005-2017

- Name / address employer University of Insubria, Department of Biotechnology and Life Sciences, via JH Dunant 3, 21100 Varese (Italy)
 - Type of business or sector Academic
 - Occupation or position held **Associate professor of Microbial Biotechnology**
 - Activities & responsibilities Research activities in the field of microbial biotechnology, fermentation, and molecular biology of microorganisms of industrial relevance, including producers of antibiotics, proteins, and peptides with biological activity. Teaching activities for the Bachelor Degree in Biotechnology (Microbial Biotechnology, Fermentation Chemistry and Biotechnology, Applied Microbiology) and for the Master Degrees in Biotechnology for the Biobased and Health Industry and Molecular and Industrial Biotechnology (Pharmaceutical Biotechnology, Biorefineries)
- Dates (from - to) 2015-2018
 - Name / address employer University of Chemistry and Technology, Prague (Czech Republic)
 - Type of business or sector Academic
 - Occupation or position held **Erasmus visiting professor**
 - Activities & responsibilities Teaching activities for Master and PhD students
- Dates (from - to) 2012-2016
 - Name / address employer University of Pavia, Pavia (Italy)
 - Type of business or sector Academic
 - Occupation or position held **Contract professor**
 - Activities & responsibilities Teaching activities for the Master Degree in Medical and Pharmaceutical Biotechnology (Antibiotics of Fermentation)
- Dates (from - to) 2004-2005
 - Name / address employer University of Insubria, Department of Biotechnology and Life Sciences, via JH Dunant 3, 21100 Varese (Italy)
 - Type of business or sector Academic
 - Occupation or position held **Contract professor**
 - Activities & responsibilities Teaching activities for the Bachelor Degree in Biotechnology (Fermentation Chemistry and Biotechnology)
- Dates (from - to) 1996-2004
 - Name / address employer Biosearch Italia, Versicor, and Vicuron Pharmaceuticals, Gerenzano, Varese (Italy)
 - Type of business or sector Pharmaceutical companies
 - Occupation or position held **Director of Industrial Microbiology and Fermentation Plant**
 - Activities & responsibilities Research and organization activities for fermentation and genetic improvement of microbial producers of antibiotics. Management of microbial and extract collections. Coordination and management of the fermentation pilot plant. Development of isolation and characterization methods for rare microorganisms producer of antibiotics, and for using bioconversion strains and enzymes for modifying molecules of industrial interest
- Dates (from - to) 1991-1996
 - Name / address employer Centro Ricerche Lepetit, Marion Merrel Dow, Hoechst Marion Roussel, Gerenzano, Varese (Italy)
 - Type of business or sector Pharmaceutical company
 - Occupation or position held **Researcher, Coordinator of Industrial Microbiology Laboratory and Fermentation pilot plant**
 - Activities & responsibilities Genetic improvement of actinomycetes producers of antibiotics, implementation of fermentation protocols
- Dates (from - to) 1988-1989
 - Name / address employer Biologisches Institut II, Albert - Ludwigs Universität, Freiburg (Germany)
 - Type of business or sector Academic
 - Occupation or position held **Post-doc fellow**
 - Activities & responsibilities Production of specialized metabolites in plant cell cultures

EDUCATION AND TRAINING

- Dates (from - to) 1987-1991
- Name organisation training Scuola Normale Superiore, Pisa (Italy)
- Principal subjects PhD thesis title: Dihydroisocoumarin phytoalexins in *Daucus carota*: characterization, synthesis, toxicity and elicitor-induced production in cell suspension cultures
- Title of qualification awarded **PhD in Chemistry**
- Dates (from - to) 1981-1986
- Name organisation training University La Sapienza, Rome (Italy)
- Principal subjects Thesis title: Produzione di acetone, etanolo e butanolo da parte di *Clostridium acetobutylicum*
- Title of qualification awarded **Degree in Biological Sciences**

PERSONAL SKILLS AND COMPETENCES

MOTHER TONGUE

Italian

OTHER LANGUAGES

English (C2)

RELEVANT ROLES AND COMPETENCES

Coordination and administration of people, projects and budgets.

- Rector Research Delegate (2021-today)
- Elected member of Academic Senate (2019-today)
- Member of the Board of Directors of Fondazione Istituto Insubrico di Ricerca per la Vita (FIIRV), Gerenzano, Varese (2020-today)
- Member of the Technical and Scientific committee of Consorzio Italbiotec (2014-today)
- Rector Delegate Consorzio Italbiotec (2008-today)
- Biotechnology Bachelor and Master Coordinator at University of Insubria (2013 -2019)
- Coordinator of the PhD course in Analysis, Protection and Management of the Biodiversity Resources (2012-2015)
- Member of the faculty of PhD course in Life Science and Biotechnology
- Faculty Member John Innes/Rudjer Bošković Boković International Summer School in Applied Molecular Microbiology (2007-present)
- Member of Center for studies on bioinspired agro-environmental technology - BAT Center and Centro di Ricerca per l'invecchiamento di Successo – CRIS (2020-today)
- Co-Editor of Fermentation, MDPI, Basel Switzerland (2015-today) and Antibiotics MDPI, Basel Switzerland (2016-today), Microbiological Research MDPI, Basel (2021.today)
- Co-inventor of four patents on anti-infective molecules (2000-today): (i) A.Lazzarini, L.Gastaldo, P.Candiani, I.Ciciliato, D.Losi, F.Marinelli, E.Selva, F.Parenti Antibiotics 107891, its factor A1 and A2, pharmaceutically acceptable salts and compositions, and use thereof. (ii) E.Selva, F.Marinelli, D.Losi, L.Cavaletti, A.Lazzarini, A.Marazzi Antibiotics GE 81112 factors A, B, B1, pharmaceutically acceptable salts and compositions, and use thereof. (iii) D.Losi, L.Cavaletti, A.Lazzarini, P.Candiani, F.Castiglione, F.Marinelli Antibiotics ID 97518, pharmaceutically acceptable salts and compositions, and use thereof. (iv) .Ciciliato, E.Corti, E.Sarubbi, S.Stefanelli, N.Montanini, F.Marinelli, M.Kurz, E.Selva Antibiotics GE 23077, pharmaceutically acceptable salts and compositions, and use thereof.
- Expert Peer Reviewer for Italian Scientific Evaluation (2015-today), Medical Research Council, UK (2010, 2016), European Union (1999, 2000, 2015, 2016), National Research Foundation South Africa (2012, 2016), Biotechnology and Biological Sciences Research Council (BBSRC) UK (2012), Council of Chemical Sciences of the Netherlands Organization for Scientific Research (2011, 2012), Research Council of Norway (2007, 2011), Technology Foundation STW Netherlands (2008), Belgium Science Policy Office (2007).

RELEVANT PUBLICATIONS

10 selected publications:

- Berini F, Orlandi V, Gornati R, Bernardini G, Marinelli F. Nanoantibiotics to fight multidrug resistant infections by Gram-positive bacteria: hope or reality? *Biotechnol Adv* 2022, 107948. doi: 10.1016/j.biotechadv.2022.107948.
- Berini F, Orlandi VT, Gamberoni F, Martegani E, Armenia I, Gornati R, Bernardini G, Marinelli F. Antimicrobial activity of nanoconjugated glycopeptide antibiotics and their effect on *Staphylococcus aureus* biofilm. *Front Microbiol* 2021, 12: 657431. doi: 10.3389/fmicb.2021.657431.
- Yushchuk O, Vior NM, Andreo-Vidal A, Berini F, Rückert C, Busche T, Binda E, Kalinowski J, Truman AW, Marinelli F. Genomic-led discovery of a novel glycopeptide antibiotic by *Nonomuraea coxensis* DSM 45129. *ACS Chem Biol* 2021, 16(5): 915-28. doi: 10.1021/acscchembio.1c00170.

- Montali A, Berini F, Brivio MF, Mastore M, Saviane A, Cappellozza S, Marinelli F, Tettamanti G. A silkworm infection model for in vivo study of glycopeptide antibiotics. *Antibiotics* 2020, 9: 300. doi: 10.3390/antibiotics9060300.
- Armenia I, Marcone GL, Berini F, Orlandi VT, Pirrone C, Martegani E, Gornati R, Bernardini G, Marinelli F. Magnetic nanoconjugated teicoplanin: a novel tool for bacterial infection site targeting. *Front Microbiol* 2018, 9: 2270. doi: 10.3389/fmicb.2018.02270.
- Marcone GL, Binda E, Berini F, Marinelli F. Old and new glycopeptide antibiotics: From product to gene and back in the post-genomic era. *Biotechnol Adv* 2018, 36(2): 534-54. doi: 10.1016/j.biotechadv.2018.02.009.
- Dalmastrì C, Gastaldo L, Marcone GL, Binda E, Congiu T, Marinelli F. Classification of *Nonomuraea* sp. ATCC 39727, an actinomycete that produces the glycopeptide antibiotic A40926, as *Nonomuraea gerenzanensis* sp. nov. *Int J Syst Evol Microbiol*. 2016, 66(2):9 12-921. doi: 10.1099/ijsem.0.000810.
- Marcone GL, Binda E, Carrano L, Bibb M, Marinelli F. Relationship between glycopeptide production and resistance in the actinomycete *Nonomuraea* sp. ATCC 39727. *Antimicrob Agents Chemother*. 2014, 58(9): 5191-201. doi: 10.1128/AAC.02626-14.
- Taurino C, Frattini L, Marcone GL, Gastaldo L, Marinelli F. *Actinoplanes teichomyceticus* ATCC 31121 as a cell factory for producing teicoplanin. *Microb Cell Fact*. 2011, 10: 82. doi: 10.1186/1475-2859-10-82.
- Brunati M, Rojas JL, Sponga F, Ciciliato I, Losi D, Göttlich E, de Hoog S, Genilloud O, Marinelli F. Diversity and pharmaceutical screening of fungi from benthic mats of Antarctic lakes. *Mar Genomics*. 2009, 2(1): 43-50. doi: 10.1016/j.margen.2009.04.002..

RELEVANT GRANTS

- EU research programmes: FP7- 222625 MetaExplore: metagenomics for bioexploration - tools and application (2009-2014). Cost Action CM0804 Chemical Biology with Natural Products (2009-2013). FP5-QLK3-CT-2001-01783 Actapharm: Novel sources of actinomycete diversity for detection of antimicrobial agents with pharmaceutical applications (2001-2004). FP4-BIO4-CT-98-0040 Micromat: Biodiversity of microbial mats in Antarctica (1998-2000). FP4-BIO4-CT-96-0332 RapidS: Rational Process Innovation and Design for *Streptomyces* (1993-1996).
- Other internationally relevant projects: R&D Cooperation program Italy-Israel - Industrial Track 2016, Production of novel metagenomics-sourced chitinases as biocontrol agents for integrated pest management (IPM) – CHITOBIOCONTROL (2016-2018). R&D Cooperation program Italy-Israel - Industrial Track 2020, New chitinase-based products for the control of insect pests – ENDPOINT (2020-2022).
- National projects: - 2023-today: "From genome-guided discovery to production of novel glycopeptide antibiotics by an integrative technological platform" (PRIN 2022, ID 2022J7W7LW). - 2022-today: "Identification of novel molecules supporting the impact of β -lactams against clinically-relevant Gram-negative multidrug resistant organisms" (FRRB Unmet Medical Needs, ID 3423223).- 2023-today: "Production of functional bacterial cellulose by a circular biotechnological platform" (PRIN PNRR 2022, ID P20229H3P9). PNRA16_00105 National Program on Antarctic Research, Microbial colonization of benthic ANTArctic environments: responses of microbial abundances, diversity, activities and larval settlement to natural or anthropogenic disturbances and search for secondary metabolites - ANT-Biofilm (2017-2019). BI.CE Bioetanolio cellulosico- Biocombustibili di seconda generazione - finanziato dal Ministero delle politiche agricole alimentari e forestali (Bando Bioenergetico D.M.246/2007 del 23/10/2007) (2011-2014). VATUB Approccio biotecnologico alla progettazione razionale di vaccini: nuovo vaccino anti tubercolosi – Finanziato da Regione Lombardia nell'ambito dell'Accordo Quadro di collaborazione con le Università lombarde (DGR n. 9139 del 30/03/2009 e n. 9565 del 11/06/2009 (2001-2004).
- Research Contracts with national and international private companies: Isagro-Gowan, Gnosis, Huvepharma, Chirotech, Angelini, Linnea, Farmhispania (different time periods, 2005 to present).
- 2014 FEMS Invited Speaker Grant
- 2012 FEMS Invited Speaker Grant.

According to law 679/2016 of the Regulation of the European Parliament of 27th April 2016, I hereby express my consent to process and use my data provided in this CV

Place and date Varese, 31/10/2023

Signature

