

Curriculum Vitae

Personal Information

Gaia Cusumano

Education

From 2011 to 2016

February 24, 2020

April 27, 2022

January 16, 2024

March 11, 2024

November 2022 - Present

Work Experience and Training

September 2019 – October 2019

April 2021- September 2021

September 2021- April 2022

November 2022 – Present

- **Scientific High School Diploma**
"M.L. King" State High School. Final grade: 95/100
 - **Bachelor's Degree in Biological Sciences (L-13)**
Department of Chemistry, Biology, and Biotechnology, University of Perugia.
Final grade: 101/110
 - **Master's Degree in Biology (LM-6)**
Biosanitary Curriculum
Department of Chemistry, Biology, and Biotechnology, University of Perugia. Final grade: 110/110 cum laude
 - **Education Course in Biowaste Valorization and Circular Economy**
University of Perugia
 - **First-Level University Master's Diploma in Scientific-Mathematical Disciplines**
Saint Camillus International University of Health Sciences.
Final grade: 110/110
 - **PhD Student in Biotechnology (Molecular and Industrial curriculum) XXXVIII Cycle**
Department of Chemistry, Biology, and Biotechnology, University of Perugia
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- **Traineeship - ANALIT S.C.A.R.L.**
Analysis of liquids and biological samples, culture examinations (bacteriology and microbiology)
 - **Internship - ANALIT S.C.A.R.L.**
Chemical and microscopic examination of biological samples, molecular biology and immunological tests, food intolerance testing, extraction of nasopharyngeal swabs for Sars-Cov2 diagnosis
 - **Thesis Student**
Mycology Laboratory, University of Perugia
Mycelium cultivation, Mycelium cultures, Microorganism cultures, Antimicrobial activity, Optical microscopy and section staining, DNA extraction, PCR, Agarose gel electrophoresis
 - **PhD Student in Biotechnology**
Isolation and characterization of extracellular vesicles from plants and fungi, ultracentrifugation, density gradient, size exclusion chromatography, cell cultures, Western Blotting, RNA extraction, Real-Time PCR

July 2024 - December 2024

▪ **Erasmus Traineeship**

Department of Biochemistry, University of Konya, Turkey

Language Skills

Mother tongue(s)

Other Language (s)

Italian

▪ **English**

Understanding - Listening: B2, Reading: B2

Speaking - Spoken interaction: B2, Spoken Production: B2

Writing: B2

▪ **Spanish**

Understanding - Listening: A2, Reading: A2

Speaking - Spoken interaction: A2, Spoken Production: A2

Writing: A2

▪ **French**

Understanding - Listening: A1, Reading: A1

Speaking - Spoken interaction: A1, Spoken Production: A1

Writing: A1

Levels: A1/A2: Basic user - B1/B2: Independent user - C1/C2: Proficient user

Technical skills

Biochemical and Cell Biology techniques: Mycelial cultures, mycelium cultivation, microbiological cultures, antimicrobial activity, cell cultures, tissue and pseudo-tissue staining techniques for optical microscopy, cell viability tests (MTT Assay), antitumor activity, purification of extracellular vesicles, purification and quantification of cellular pellets, Bradford protein assay, spectrophotometric analysis, antioxidant activity (DPPH, ABTS, CUPRAC, and FRAP).

Molecular Biology techniques: DNA and RNA extraction, PCR, Real-Time PCR, agarose gel electrophoresis, SDS-PAGE, Western Blotting

Soft skills

Ability to work in a team, problem solving, adaptability to new contexts, attention to detail, time management, good communication skills, empathy, flexibility, excellent organizational skills.

Digital skills

Excellent knowledge of the Windows operating system and Microsoft Office and Libre Office tools. Good command of data analysis software such as GraphPad and ImageJ.

Additional Information

Book Chapter

- Gafforov, Y.; Rašeta, M.; Rapior, S.; Tomšovský, M.; Angelini, P.; Cusumano, G.; Venanzoni, R.; Angeles Flores, G.; Yarasheva, M.; Zhou, L.-W. *Bjerkandera adusta* (Willd.) P. Karst.; *Bjerkandera Fumosa* (Pers.) P. Karst. - MERULIACEAE. In *Ethnobiology of Uzbekistan: Ethnomedicinal Knowledge of Mountain Communities*; Khojimatov, O. K., Gafforov, Y., Bussmann, R. W., Eds.; Springer International Publishing: Cham, 2023; pp 939–958.
- Gafforov, Y.; Angelini, P.; Cusumano, G.; Venanzoni, R.; Angeles Flores, G.; Rašeta, M.; Rapior, S. *Auricularia mesenterica* (Dicks.) Pers. - AURICULARIACEAE. In *Ethnobiology of Uzbekistan: Ethnomedicinal Knowledge of Mountain Communities*; Khojimatov, O. K., Gafforov, Y., Bussmann, R. W., Eds.; Springer International Publishing: Cham, 2023; pp 931–937.

Publications

- Gafforov, Y.; Tomšovský, M.; Cai, L.; Angelini, P.; Cusumano, G.; Venanzoni, R.; Angeles Flores, G.; Rašeta, M.; Deshmukh, S. K.; Rapior, S. *Laetiporus sulphureus* (Bull.) Murrill - FOMITOPSIDACEAE. In *Ethnobiology of Uzbekistan: Ethnomedicinal Knowledge of Mountain Communities*; Khojimatov, O. K., Gafforov, Y., Bussmann, R. W., Eds.; Springer International Publishing: Cham, 2023; pp 1219–1236.
- Gafforov, Y.; Angelini, P.; Cusumano, G.; Venanzoni, R.; Angeles Flores, G.; Ghobad-Nejhad, M.; Bussmann, R. W.; Tomšovský, M. *Inonotus Hispidus* (Bull.) P. Karst.; *Inonotus obliquus* (Fr.) Pilát - HYMENOPHYTES. In *Ethnobiology of Uzbekistan: Ethnomedicinal Knowledge of Mountain Communities*; Khojimatov, O. K., Gafforov, Y., Bussmann, R. W., Eds.; Springer International Publishing: Cham, 2023; pp 1193–1202.
- Gafforov, Y.; Angelini, P.; Cusumano, G.; Venanzoni, R.; Angeles Flores, G.; Tomšovský, M.; Yarasheva, M.; Rašeta, M.; Bussmann, R. W.; Rapior, S. *Lentinus arcularius* (Batsch) Zmitr.; *Lentinus Brumalis* (Pers.) Zmitr.; *Lentinus Ciliatus* (Fr.) Zmitr.; *Lentinus Squarrosulus* Mont.; *Lentinus Tigrinus* (Bull.) Fr. - POLYPORACEAE. In *Ethnobiology of Uzbekistan: Ethnomedicinal Knowledge of Mountain Communities*; Khojimatov, O. K., Gafforov, Y., Bussmann, R. W., Eds.; Springer International Publishing: Cham, 2023; pp 1253–1270.
- Angeles Flores G., Girometta C.E., Cusumano G., Angelini P., Tirillini B., Ianni F., Blasi F., Cossignani L., Pellegrino R.M., Emiliani C., Venanzoni R., Venturella G., Colasuonno P., Cirilincione F., Gargano M.L., Zengin G., Acquaviva A., Di Simone S.C., Orlando G., Menghini L., Ferrante C. 2022. Untargeted Metabolomics Used to Describe the Chemical Composition, Antioxidant and Antimicrobial Effects of Extracts from *Pleurotus* spp. Mycelium Grown in Different Culture Media. *Antibiotics* 11: 1468.
- Serventi L., Angeles Flores G., Cusumano G., Barbaro D., Tirillini B., Venanzoni R., Angelini P., Acquaviva A., Di Simone S.C., Orlando G., Zengin G., Menghini L., Ferrante C. (2023). Comparative Investigation of Antimicrobial and Antioxidant Effects of the Extracts from the Inflorescences and Leaves of the *Cannabis sativa* L. cv. strawberry. *Antioxidants* 12(2): 219. <https://doi.org/10.3390/antiox12020219>
- Angeles Flores G., Cusumano G., Ianni F., Blasi F., Angelini P., Cossignani L., Pellegrino R.M., Emiliani C., Venanzoni R., Zengin G., Acquaviva A., Di Simone S.C., Libero M.L., Nilofar Orlando G., Menghini L., Ferrante C.(2023). *Fomitopsis officinalis*: Spatial (Pileus and Hymenophore) Metabolomic Variations Affect Functional Components and Biological Activities. *Antibiotics* 12:766. <https://doi.org/10.3390/antibiotics12040766>
- Girometta C, Angeles Flores G., Cusumano G., Pellegrino R., Silviani S., Bistocchi G., Arcangeli A., Ianni F., Cossignani L., Rubini A., Tirillini B., Emiliani C., Menghini L., Ferrante C., Venanzoni R., Angelini P. (2023). Diversity of *Pleurotus* spp. (Agaricomycetes) and Their Metabolites of Nutraceutical and Therapeutic Importance. *International Journal of Medicinal Mushrooms*. 25. 10.1615/IntJMedMushrooms.2023048295.
- Lazarova I., Zengin G., Piatti D., Uba A.I., Sagratini G., Caprioli G., Emre G., Ponnira S.K.M., Rengasamy K.R., Paradis N.J., Koyuncu I., Şeker F., Wu C., Nilofar N., Angeles Flores G., Cusumano G., Angelini P., Venanzoni R. (2023). Appraisals on the chemical characterization and biological potentials of *Ranunculus constantinopolitanus* extracts using chromatographic, computational, and molecular network approaches. *Food and Chemical Toxicology* 181:114064. <https://doi.org/10.1016/j.fct.2023.114064>
- Angelini P., Angeles Flores G., Cusumano G., Venanzoni R., Pellegrino R.M., Zengin G., Di Simone S.C., Menghini L., Ferrante C. (2023). Bioactivity and Metabolomic Profile of Extracts Derived from Mycelial Solid Cultures of *Hypsizygus marmoreus*. *Microorganisms* 11:2552. <https://doi.org/10.3390/microorganisms11102552>
- Angeles Flores, G., Cusumano, G., Venanzoni, R., & Angelini, P. (2024). The Glucans Mushrooms: Molecules of Significant Biological and Medicinal Value. *Polysaccharides*, 5(3), 212–224. <https://doi.org/10.3390/polysaccharides5030016>
- Ahmed, S., Zengin, G., Selvi, S., Ak, G., Cziáky, Z., Jekő, J., Rodrigues, M. J., Custodio, L., Venanzoni, R., Flores, G. A., Cusumano, G., & Angelini, P. (2024). Characterising the Metabolomic Diversity and Biological Potentials of Extracts from Different Parts of Two *Cistus* Species Using UHPLC-MS/MS and In Vitro Techniques. *Pathogens*, 13(9).
- Yagi S., Zengin G., Selvi S., Ak G., Cziáky Z., Jekő J., João Rodrigues M., Custódio L., Venanzoni R., Angeles Flores G., Cusumano G., Angelini P. (2024). A multidirectional study on chemical fingerprints and biological activities of three *Cistus* extracts (C.

creticus, *C. laurifolius*, and *C. salviifolius*) with ethnomedicinal uses. Turkish Journal of Botany

- Cerrotti, G., Buratta, S., Latella, R., Calzoni, E., Cusumano G., Bertoldi, A., Porcellati, S., Emiliani, C., & Urbanelli, L. (2024). Hitting the target: Cell signaling pathways modulation by extracellular vesicles. *Extracellular Vesicles and Circulating Nucleic Acids*, 5(3), 627–652.
- Cusumano, G., Angeles Flores, G., Cetiz, M. V., Kurt, U., Ak, G., Saka, E., Aly, S.H., Eldahshan, O. A., Singab, A. N., Zengin, G., Şenkardeş, I., Rodrigues, M. J., Custódio, L., Emiliani, C., Angelini, P. (2024). Small steps to the big picture for health-promoting applications through the use of chickweed (*Stellaria media*): In vitro, in silico and pharmacological network approaches. *Food Science & Nutrition*.
- Di Simone, S. C.; Libero, M. L.; Pulcini, R.; Nilofar, N.; Chiavaroli, A.; Tunali, F.; Angelini, P.; Flores, G. A.; Venanzoni, R.; Cusumano, G.; Zengin, G.; Brunetti, L.; Recinella, L.; Leone, S.; Orlando, G.; Menghini, L.; Ferrante, C.; Acquaviva, A. Phytochemical Profiling and Biological Evaluation of the Residues from Industrial Hemp (*Cannabis Sativa* L.) Inflorescences Trimming: Focus on Water Extract. *Food Bioscience* 2024, 62, 105344. <https://doi.org/10.1016/j.fbio.2024.105344>.
- Angeles Flores, G.; Cusumano, G.; Zengin, G.; Cetiz, M.V.; Uba, A.I.; Senkardes, I.; Koyuncu, I.; Yuksekdog, O.; Kalyniukova, A.; Emiliani, C.; et al. Using In Vitro and In Silico Analysis to Investigate the Chemical Profile and Biological Properties of *Polygonum istanbulicum* Extracts. *Plants* 2024, 13, 3421. <https://doi.org/10.3390/plants13233421>
- Ghobad-Nejhad, M.; Zhou, L.; Tomšovský, M.; Angelini, P.; Cusumano, G.; Angeles Flores, G.; Venanzoni, R.; Wang, X.; Chaharmiri-Dokhaharani, S.; Moridi Farimani, M.; et al. Unlocking Nature's Pharmacy: Diversity of Medicinal Properties and Mycochemicals in the Family Hymenochaetales (Agaricomycetes, Basidiomycota). *Mycosphere* 2024, 15, 6347–6438, doi:10.5943/mycosphere/15/1/27.
- Calzoni, E.; Montegiove, N.; Cesaretti, A.; Bertoldi, A.; Cusumano, G.; Gigliotti, G.; Emiliani, C. Microplastic and Extracellular Vesicle Interactions: Recent Studies on Human Health and Environment Risks. *Biophysica* 2024, 4, 724-746. <https://doi.org/10.3390/biophysica4040047>
- Calzoni, E.; Bertoldi, A.; Cusumano, G.; Buratta, S.; Urbanelli, L.; Emiliani, C. Plant-Derived Extracellular Vesicles: Natural Nanocarriers for Biotechnological Drugs. *Processes* 2024, 12, 2938. <https://doi.org/10.3390/pr12122938>
- Di Simone, S.C.; Acquaviva, A.; Libero, M.L.; Nilofar, N.; Tunali, F.; Angelini, P.; Angeles Flores, G.; Cusumano, G.; Recinella, L.; Leone, S.; et al. Unravelling the Neuroprotective Effects of a Novel Formulation Based on Plant Extracts, Mg, and Vitamin B6. *Nutraceuticals* 2025, 5, 5. <https://doi.org/10.3390/nutraceuticals5010005>
- Flores, G.A.; Cusumano, G.; Zengin, G.; Venanzoni, R.; and Angelini, P. (2025), Fungal Biomolecules for Food and Pharmaceutical Application. *eFood*, 6: e70033. <https://doi.org/10.1002/efd2.70033>
- Angeles Flores, G.; Cusumano, G.; Venanzoni, R.; Angelini, P. Advancements in Antibacterial Therapy: Feature Papers. *Microorganisms* 2025, 13, 557. <https://doi.org/10.3390/microorganisms13030557>
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Conference

27-30 September, 2022

13-14 October, 2022

11-12 November, 2022

23-30 January, 2023

- IMMC11- The 11th International Medicinal Mushroom Conference. International Society for Medicinal Mushrooms and University of Belgrade. Belgrade, Serbia.
- INTERNATIONAL SCIENTIFIC CONFERENCE ON PLANT BIODIVERSITY & SUSTAINABILITY 2022. University "Gabriele D'annunzio", Chieti, Italy. Remote Oral Presentation: Cusumano G., Girometta C.E., Angeles Flores G., Pellegrino R.M., Silviani S., Bistocchi G., Arcangeli A., Ianni F., Blasi F., Cossignani L., Rubini A., Tirillini B., Emiliani C., Menghini L., Ferrante C., Venturella G., Colosuonno P., Cirlincione F., Gargano M.L., Venanzoni R., Angelini P. "Biological activities and metabolic response of mycelia of *Pleurotus* spp. grown in different cultural media".
- II NATIONAL CONGRESS Italian Society of Medicinal Mushrooms (SIFM) Pisa 2022. Medicinal Mushrooms: Current Trends and Prospects. Pisa, Italy. Remote Oral Presentation: Cusumano G., Pellegrino R.M., Tirillini B., Angeles Flores G., Alabed H. B. R., Ianni F., Blasi F., Cossignani L., Orlando G., Menghini L., Ferrante C., Venanzoni R., Angelini P. "Profilo metabolomico e attività biologiche di *Pleurotus columbinus* Quél. coltivato su diversi sottoprodotti agro-alimentari"
- Winter School on Biotechnology – Biotechnology and Aging. University of Perugia, Italy

9-10 February, 2023

- 2nd Conference of Young Botanists (CYBO) by Italian Botanical Society, Bozen, Italy. Oral Presentation: Angeles Flores G., Girometta C.E., Cusumano G., Angelini P., Tirillini B., Ianni F., Blasi F., Cossignani L., Pellegrino R.M., Emiliani C., Venanzoni R., Venturella G., Colasuonno P., Cirlincione F., Gargano M.L., Zengin G., Acquaviva A., Di Simone S.C., Orlando G., Menghini L., Ferrante C. "Untargeted metabolomics used to describe the chemical composition, antioxidant and antimicrobial effects of extracts from *Pleurotus* spp. mycelium grown in different culture media".

4-8 September, 2023

- XIX Congress of European Mycologists by European Mycological Association (EMA), Perugia, Italy.
Member of the Organizing Committee
Session Leader in the session: "Mycology by Young Scientists."
Oral presentation: Cusumano G., Angeles Flores G., Angelini P., Candelaresi L., Pellegrino R.M., Emiliani C., Venanzoni R. "Metabolomics as a tool to discriminate *Ganoderma lucidum* and *Ganoderma valesiacum* mycelium grown in liquid culture medium".

18-24 September, 2023

- Summer School "Green Biotech Entrepreneurship", University of Agronomic Sciences and Veterinary Medicine Bucharest, Romania.

21-22 May, 2024

- International Scientific Conference on PLANT BIODIVERSITY AND SUSTAINABILITY 2024. University "Gabriele D'annunzio", Chieti, Italy.
Remote Oral Presentation: Cusumano G., Ianni F., Blasi F., Angelini P., Cossignani L., Pellegrino R.M., Emiliani C., Venanzoni R., Zengin G., Acquaviva A., Angeles Flores G., Di Simone S.C., Libero M.L., Nilofar, Orlando G., Menghini L., Ferrante C. "*Fomitopsis officinalis*: Investigating Spatial Metabolomic Diversity in Pileus and Hymenophore and Its Impact on Functional Components and Biological Activities"

27-31 May, 2024

- Spring School on Biotechnology: Biomaterials and Biodevices in Biotechnology.
Oral presentation: Cusumano G., Bertoldi A., Cerrotti G., Calzoni E., Angeles Flores G., Urbanelli L., Angelini P., Venanzoni R. and Emiliani C. "Cross-kingdom cross-talk between Plant and Mushrooms-Derived Extracellular Vesicles and mammalian cells".

6-8 June, 2024

- Agriculture for Life, Life for Agriculture 2024, Bucharest, Romania.
Poster Presentation: Cusumano G., Bertoldi A., Cerrotti G., Calzoni E., Urbanelli L., Angelini P., Angeles Flores G., Venanzoni R., Emiliani C. "Purification and characterization of Extracellular Vesicles from the edible mushroom *Pleurotus eryngii*"

Tutoring Activities

Academic Year 2022-2023

- Tutoring activities in Biochemical Methodologies.

Academic Year 2023-2024

- Tutoring activities in Molecular and Industrial Biotechnologies

Driving Licence

- B

24/03/2025

Gaia Cusumano