

BIOGRAPHICAL SKETCH

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NAME: Alessia Caterina Giannetto

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POSITION TITLE: Associate Professor

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.*)

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
University of Messina, ITALY	Five-year Degree	22/07/2004	Biological Sciences
University of Messina, ITALY	Qualification for practicing of Biologist profession	2004	Biological Sciences
University of Messina, ITALY	Ph.D	20/03/2008	Biology and Cellular Biotechnologies

A. Personal Statement

I am an Associate Professor of Cellular Biology. My career has developed over a long training period characterized by precarious positions that, however, allowed me to acquire the scientific skills necessary to tackle the research projects in which I have been involved as a participant and as PI.

I have a broad background in the investigations on cellular mechanisms underlying metabolic pathways related to oxidative stress, immune response and growth of aquatic species; in particular the studies on marine ecosystem biomonitoring addressed the effects of several environmental factors including chemicals, heavy metals, metal nanoparticles, microplastics, emerging contaminants and hypoxia on gene and protein expression, DNA damage and relationships between DNA modification (methylation) and fitness-related parameters (growth, survival, development). During my PhD, I was awarded a highly competitive research program (2009-Yggdrasil Fellowship) which allowed me to acquire specific skills and expertise in using molecular and genomic tools to study muscle growth and innate immune responses in fish, with special focus on their epigenetic regulation; in particular, my research activity centered on transcriptional networks that regulate somatic growth and sexual maturation in fish and in understanding how they are influenced by external and environmental factors.

The most recent interests focus on natural bioactive molecules from the insect *Hermetia illucens*, commonly known as Black Soldier Fly (BSF), that represents a valuable and sustainable biotechnology for food waste valorisation and alternative protein sources production. In particular, our early studies on the cellular mechanisms underlying metabolic pathways related to growth and complex processes of BSF development in various environmental conditions as well as the relevant bioconversion efficiency directed the interests and efforts in assessing the potential of BSF-extracted compounds with relevant antioxidants and cytoprotective properties that can be used as natural ingredients in biomedical and environmental applications. Within this framework, a particularly interesting aspect concerns the biomolecules contained in extracellular vesicles (EVs) playing a role in cell-cell communication. The funded research project (PRIN PNRR 2022 SURPRISE project), in which I am the research manager, aimed at assessing potential biologically active compounds contained within EVs and released by key invertebrate organisms, such as *Hermetia illucens* and *Paracentrotus lividus*, in response to environmental stimuli to develop new drug candidates opening a new frontier in nanomedicine.

Thanks to my previous research activities, I am aware of the importance in establishing collaborations with other researchers and project members, as can be inferred from the scientific production, and I am

confident I have acquired leadership skills and expertise to successfully administer the projects in terms of planning, budget and timeline.

B. Positions, Scientific Appointments, and Honors

Positions:

2021 to date: Associate Professor, University of Messina;
2024 to date: Master's Degree Coordinator of the Biology and Ecology of The Coastal Marine Environment Master's Degree Course;
2021 to 2023: Member of the Council of the Department of Chemical, Biological, Pharmaceutical and Environmental Sciences (ChiBioFarAm) at the University of Messina;
2019-2020: Member of the Quality Assurance Group for the MSc in "Biology and Ecology of Coastal Marine Environment", University of Messina;
2021 to date: member of the commission of the Ethics Committee for the Department of Chemical, Biological, Pharmaceutical and Environmental Sciences;
2020-2025: Member of the joint commission Teachers-Student, University of Messina;
2018 – 2021 Temporary researcher L 240/10 (b), University of Messina;
2016 – 2018 Temporary researcher L 240/10 (a), University of Messina;
2015 – 2016 Post-Doc Research Fellow, University of Messina;
2014 – 2015 Post-Doc Research Fellow, University of Messina;
2012 – 2013 Post-Doc Research Fellow, University of Messina;
2011 – 2012 Post-Doc Research Fellow, University of Messina;
2009 – 2010 **highly competitive** mobility program *Yggdrasil Young Guest and Doctoral Researchers Annual Scholarships for Investigation and Learning in Norway*; Bodø University College, Norway;
2008 – 2009 Post-Doc Research Fellow, University of Messina;
2019 – to date: lecturer for PhD students of the Doctorate in *Applied Biology and Experimental Medicine*, University of Messina.
2014 – to date: lecturer of several courses including *Cytology and Histology*, *Stem cells and differentiation*, *Ecocytotoxicology*, *Biotechnologies in Cytotoxicology*, *Reproductive Biology and Embryology of Aquatic Organisms* for the BSc in "Biological Sciences" and for the MSc in "Biology of Health, Applied Technologies and Nutrition" and in "Biology and Ecology of Coastal Marine Environment", University of Messina.

Supervisor of master's students and PhD-students.

Scientific Appointments:

2017 – to date: member of the Teaching Committee of the Doctorate in APPLIED BIOLOGY AND EXPERIMENTAL MEDICINE at the University of Messina;
27.01.2022: Member of the Evaluation Committee for the evaluation of the final exam relating to the PhD in the Doctorate in APPLIED BIOLOGY AND EXPERIMENTAL MEDICINE - University of Messina;
25.07.2022: Member of the Evaluation Committee for the evaluation of the final exam relating to the PhD in the Doctorate in APPLIED BIOLOGY AND EXPERIMENTAL MEDICINE - University of Messina;
2023: Effective Member (opponent) of the PhD thesis defence at the Faculty of Bioscience and Aquaculture, Nord University, Norway;
AY 2021/2022: Effective member of the Evaluation Committee for the evaluation of the final exam relating to the PhD in the Doctorate in EARTH AND ENVIRONMENTAL SCIENCES - University of Catania;
Research project evaluator for International Cooperation Program Era-Net Blue Bioeconomy;
Research project evaluator for FY18 Coastal Hypoxia Research Program (CHRP) (2018);
Research project evaluator for Czech Science Foundation public funding agency (Czech Republic) (2017);
Research project evaluator for Woods Hole Sea Grant Program (2015);
AY 2009/2010: Research assignments within the GrowCod research project (Ref. 190350/S40) for a period of ten months at the Nord University, Norway;
2025 to date: affiliation to Italian Society of Experimental Biology (S.I.B.S.);
2021 to date: affiliation to Scientific Community of the Zoological Station Anton Dohrn;

2006 to date: affiliation to Società Unione Zoologica Italiana (UZI);
 2019 to date: affiliation to Accademia Peloritana dei Pericolanti, II class of Medical-Biological Sciences;
 2009-2014: affiliation to Academic Affiliation to the “Faculty of Biosciences and Aquaculture”, University of Nordland/Bodø University College, Norway;
 2017-to date: affiliation to Italian Embryology Group (GEI-SIBSC);
 Associate Editor, *Animals* (MDPI) (ISSN 2076-2615);
 Guest Editor of Special Issue “*Waste Valorization via Hermetia illucens: Potential Applications of Insect Biomass*”, *Animals* IF:2.323;
 Guest Editor of Special Issue “*Applications of Natural Products in Sustainable Biotechnology*”, *International Journal of Molecular Sciences*, IF 5.6;
 2025: Patent holder: *Hi – Household Breeding System*. Incubator for the home production of *Hermetia illucens* larval biomass. N° 102023000004128 Ref. P4828IT00;
 2023 to date Spin-off member: *Sea in Health and Life*.

Honors:

- 2009-Yggdrasil Fellowship, Funded by Research Council of Norway, (17.654,00 €);
- 2010-Research and development grant (FoU) for scientific projects, “Expression analysis of DNA (cytosine-5)-methyltransferases from Atlantic cod under photoperiod condition” amounting of 6.750 NOK (744,817 €) funded by the University of Nordland, Norway;
- 2010-Registration, travel and accommodation grant (FoU) for conference participation: 9^o International Congress of Biology of Fish, Barcellona 5-9 July 2010 (“The MLL genes in Atlantic cod (*Gadus morhua*) and their expression during photoperiod manipulation.” amounting of 6.750 NOK (744,817 €) funded by the University of Nordland, Norway.
- 2009-Research and development grant (FoU) for scientific projects, “The role of DNA (cytosine-5)-methyltransferases in the epigenetic regulation of sexual maturation and growth in Atlantic cod” amounting of 26.000 NOK (2.868,92 €) funded by the University of Nordland, Norway.

C. Contributions to Science

The most recent research interests focus on studying the cellular mechanisms underlying metabolic pathways related to the growth of the insect *Hermetia illucens*, commonly known as Black Soldier Fly (BSF), that represents a sustainable alternative for food waste valorisation. The aim of this research topic is understanding the complex processes of BSF development, together with the evaluation of the application potential of larval biomass as an alternative and sustainable source of nutrients and bioactive molecules with relevant antioxidant and cytoprotective properties that can be used as natural ingredients in biomedical and environmental applications.

I served as the primary investigator in all of these studies:

1. Riolo K., Franco G.A., Marino Y., Ferreri A., Oliva S., Parrino V., Savastano D., Cuzzocrea S., Gugliandolo E., **Giannetto A***. 2024. Protein hydrolysates from *Hermetia illucens* trigger cellular responses to cope with LPS-induced inflammation and oxidative stress in L-929 cells. *Anim Cells Syst* (Seoul), 29(1):1-12. doi: 10.1080/19768354.2024.2442389. PMID: 39777024; PMCID: PMC11703461.
2. Riolo K., Rotondo A., La Torre G.L., Marino Y., Franco G.A., Crupi R., Fusco R., Di Paola R., Oliva S., De Marco G., Savastano D., Cuzzocrea S., Gugliandolo E., **Giannetto A***. 2023. Cytoprotective and Antioxidant Effects of Hydrolysates from Black Soldier Fly (*Hermetia illucens*). *Antioxidants*, 12(2):519. doi: 10.3390/antiox12020519. PMID: 36830077; PMCID: PMC9952651. IF: 7.675
3. Lanes C.F., Pedron F.A., Bergamin, G.T., Bitencourt A.L., Dorneles B.E., Villanova J.C., Dias K.C., Riolo K., Oliva S., Savastano D., **Giannetto A***. 2021. Black Soldier Fly (*Hermetia illucens*) Larvae and Prepupae Defatted Meals in Diets for Zebrafish (*Danio rerio*). *Animals*, 11(3), 720. IF: 2.7
4. Acar Ü., **Giannetto, A***, Giannetto D., Kesbiç O.S., Yilmaz S., Romano A., Tezel R., Türker A., Güllü K., Fazio F. 2021. Evaluation of an Innovative and Sustainable Pre-Commercial Compound as Replacement of Fish Meal in Diets for Rainbow Trout during Pre-Fattening Phase: Effects on Growth Performances, Haematological Parameters and Fillet Quality Traits. *Animals*, 11, 3547. <https://doi.org/10.3390/ani11123547>. IF: 2.7

5. **Giannetto A.***, Oliva S., Riolo K., Savastano D., Parrino V., Cappello T., Maisano M., Fasulo S., Mauceri A., 2020. Waste Valorization via *Hermetia illucens* to Produce Protein-Rich Biomass for Feed: Insight into the Critical Nutrient Taurine. *Animals*, 10, 1710; doi:10.3390/ani10091710. IF: 2.7
6. **Giannetto A.***, Oliva S., Ceccon Lanes C.F., de Araújo Pedron F., Savastano D., Baviera C., Parrino V., Lo Paro G., Spanò N., Cappello T., Maisano M., Mauceri A., Fasulo S. 2020. *Hermetia illucens* (Diptera: Stratiomyidae) larvae and prepupae: biomass production, fatty acid profile and expression of key genes involved in lipid metabolism. *Journal of Biotechnology*. <https://doi.org/10.1016/j.jbiotec.2019.10.015>. IF: 4.1
7. **Giannetto A.***, Oliva S., Mazza L., Mondello G., Savastano D., Mauceri A., Fasulo S. 2017b. Molecular characterization and expression analysis of heat shock protein 70 and 90 from *Hermetia illucens* reared in a food waste bioconversion pilot plant. *Gene* 627, 15-25. IF: 2.984

Past and current research interests also include:

- *In vitro* and *in vivo* evaluation of protein hydrolysates obtained from by-products of industrial processing as valuable nutraceutical in food, feed and pharmaceutical industry with particular interest in the perspective of waste valorization:

1. **Giannetto A.***, Esposito E., Lanza M., Oliva S., Riolo K, Di Pietro S., Abbate JM., Briguglio G., Cassata G., Cicero L., Macrì F. 2020. Protein Hydrolysates from Anchovy (*Engraulis encrasicolus*) Waste: In Vitro and In Vivo Biological Activities. *Marine Drugs*, 18, 86; doi:10.3390/md18020086. IF: 4.9

- Physiological and molecular responses of marine organisms to several environmental constraints. including studies on marine ecosystem biomonitoring, effects of chemicals and heavy metals on gene and protein expression, evaluation of oxidative stress biomarkers, DNA damage, relationships between DNA modification (methylation) and fitness-related parameters (growth, survival, development) in fish and mussels; microRNAs and epigenetic regulation of the oxidative stress and innate immune response gene networks by environmental factors, such as photoperiod in commercially important species:

1. **Giannetto A.***, Fernandes J.M.O., Nagasawa K., Mauceri A., Maisano M., De Domenico E., Cappello T., Oliva S., Fasulo S. 2014. *Influence of continuous light treatment on expression of stress biomarkers in Atlantic cod*. *Developmental and Comparative Immunology* 44, 30-40. IF: 3.192
2. Lazado C.C., Kumaratunga H.P.S., Nagasawa K., Babiak I., **Giannetto A.**, Fernandes J.M.O. 2014. Daily Rhythmicity of Clock Gene Transcripts in Atlantic Cod Fast Skeletal Muscle. *PLoS ONE* 9(6): e99172. <https://doi.org/10.1371/journal.pone.0099172>
3. **Giannetto A.**, Nagasawa K., Fasulo S., Fernandes J.M.O*. 2013. *Influence of photoperiod on expression of DNA (cytosine-5) methyltransferases in Atlantic cod*. *GENE* 519: 222-230. IF: 2.984
4. Nagasawa K., **Giannetto A.**, Fernandes J.M. 2012. Photoperiod influences growth and mll (mixed-lineage leukaemia) expression in Atlantic cod. *PLoS One* 7(5):e36908. doi: 10.1371/journal.pone.0036908

- Evaluation of the effects of metal nanoparticles, microplastics and emerging contaminants on aquatic organisms:

1. Afsa S., De Marco G., Cristaldi A., **Giannetto A.**, Galati M., Billè B., Oliveri Conti G., Ben Mansour H., Ferrante M., Cappello T. 2023. Single and combined effects of caffeine and salicylic acid on mussel *Mytilus galloprovincialis*: Changes at histomorphological, molecular and biochemical levels. *Environ Toxicol Pharmacol*. 101:104167. doi: 10.1016/j.etap.2023.104167. IF: 4.2
2. Afsa S., De Marco G., **Giannetto A.**, Parrino V., Cappello T., Ben Mansour H., Maisano M. 2022. Histological endpoints and oxidative stress transcriptional responses in the Mediterranean mussel *Mytilus galloprovincialis* exposed to realistic doses of salicylic acid. *Environ Toxicol Pharmacol*. 92:103855. doi: 10.1016/j.etap.2022.103855. Epub 2022. PMID: 35342010. IF: 5.785
3. De Marco G., Conti G.O., **Giannetto A.**, Cappello T., Galati M., Iaria C., ... & Maisano M. 2022. Embryotoxicity of polystyrene microplastics in zebrafish *Danio rerio*. *Environmental research*, 208, 112552. IF: 8.431

4. **Giannetto A.**, Cappello T., Oliva S., Parrino V., De Marco G., Fasulo S., Mauceri A., Maisano M. 2018. Copper oxide nanoparticles induce the transcriptional modulation of oxidative stress-related genes in *Arbacia lixula* embryos. *Aquatic Toxicology*. 201, 187-197. IF: 4.344
 5. Multisanti C.R., Riolo K., Impellitteri F., Zicarelli G., Vazzana I., Cafeo G., Russo M., Dugo P., Faggio C., **Giannetto A.** 2025. Bergamot (*Citrus bergamia*) as a potential anti-stress agent: Counteracting cellular and physiological changes by sodium lauryl sulphate in *Mytilus galloprovincialis*. *Environmental Pollution* 371, 125939, <https://doi.org/10.1016/j.envpol.2025.125939>. IF: 7.6
 6. Impellitteri F., Riolo K., Zicarelli G., Porretti M., Multisanti C.R., Piccione G., **Giannetto A.***, Faggio C. 2025. Evaluation of cellular and physiological alterations of cells from *Mytilus galloprovincialis* exposed to benzoisothiazolinone, *Ecotoxicology and Environmental Safety* 290, 117631, <https://doi.org/10.1016/j.ecoenv.2024.117631>. IF: 6.2
 7. Impellitteri, F., Riolo, K., Multisanti, C. R., Zicarelli, G., Piccione, G., Faggio, C., & **Giannetto, A.** 2024. Evaluating quaternium-15 effects on *Mytilus galloprovincialis*: New insights on physiological and cellular responses. *Science of The Total Environment* 918, 170568. doi.org/10.1016/j.scitotenv.2024.170568. IF: 8.2
 8. Multisanti CR, Riolo K, Impellitteri F, Chebbi I, Faggio C, **Giannetto A.** 2023. Short-term in vitro exposure of *Pinctada imbricata*'s haemocytes to quaternium-15: Exploring physiological and cellular responses. *Environ Toxicol Pharmacol.* 101:104198. doi: 10.1016/j.etap.2023.104198. IF: 4.2
- Characterization of molecular response to oxygen availability in marine invertebrate involving transcription factors as key players in the strategies to cope with the hypoxia, a rising feature in aquatic ecosystems:
1. **Giannetto A.***, Maisano M., Cappello T., Oliva S., Parrino V., Natalotto A., De Marco G., Fasulo S. 2017a. Effects of Oxygen Availability on Oxidative Stress Biomarkers in the Mediterranean Mussel *Mytilus galloprovincialis*. *Marine Biotechnology* DOI 10.1007/s10126-017-9780-6. IF: 3.062
 2. **Giannetto A.***, Maisano M., Cappello T., Oliva S., Parrino V., Natalotto A., De Marco G., Barberi C., Romeo O., Mauceri A., Fasulo S. 2015. *Hypoxia-inducible factor α and Hif-prolyl hydroxylase characterization and gene expression in short-time air exposed Mytilus galloprovincialis*. *Marine Biotechnology* 17:768–781. IF: 3.062

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