

## Maria Immacolata Ferrante



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**Current Position:** Senior Researcher

**Current Affiliation:**

Department of Integrative Marine Ecology, Stazione Zoologica Anton Dohrn, Napoli (Italy)

### **Education/Training/Experience**

<b>Institute and Location</b>	<b>Degree / Function</b>	<b>Year</b>	<b>Field of Study</b>
Istituto Internazionale di Genetica e Biofisica (IIGB), Consiglio Nazionale delle Ricerche (CNR), Naples, Italy	Master student	1997-1998	Molecular biology, regulation of gene expression
Università di Napoli Federico II, Italy	<b>Laurea in Biological Sciences</b>	1998	Master thesis in molecular biology
Istituto Internazionale di Genetica e Biofisica (IIGB), (CNR), Naples, Italy	Apprenticeship	1999	Regulation of gene expression
Telethon Institute of Genetics and Medicine (TIGEM), Milan, Italy	Fellow	1999-2000	Disease gene identification
Telethon Institute of Genetics and Medicine (TIGEM), Naples, Italy	PhD student	2001-2004	Disease gene identification, mouse models, mouse genetics
Università di Napoli Federico II, Italy	<b>PhD</b>	2004	Genetics

Wellcome Trust Sanger Institute, Cambridge, UK	Wellcome Trust Sanger Postdoctoral Fellow	2005-2010	Zebrafish genetics and developmental biology
Wellcome Trust Sanger Institute, Cambridge, UK	Staff scientist	2010	Zebrafish genetics and developmental biology
Stazione Zoologica Anton Dohrn, Naples, Italy	Researcher	2010-2020	Diatom biology, functional genomics
Stazione Zoologica Anton Dohrn, Naples, Italy	Senior Researcher	2020-present	Diatom biology, functional genomics

National scientific qualification (Abilitazione Scientifica Nazionale) to function as associate professor in Molecular Biology (05/E2), Genetics (05/I1) and Applied Biology (05/F1) in Italian Universities, from April 2017 to April 2023.

### **Grants and Fellowships**

JGI 100 Diatoms Genome Project, funded by the Joint Genome Institute. Partner. December 2020-November 2023.

TechOceans – Technologies for Ocean Sensing. EU Horizon 2020 project. Partner. Grant No. 101000858. November 2020-October 2024.

DIscO (Diatom life cycles, molecular controls and contribution to ecosystem dynamics), funded by the Gordon and Betty Moore Foundation's Marine Microbiology Initiative. PI - December 2018-May 2022.

Assemble Plus (Association of European Marine Biological Research Laboratories Expanded), EU H2020 project. Partner - October 2017- September 2021.

DiaEdit (Development of genetic tools for the establishment of routine genome editing in the marine diatom *Phaeodactylum tricornutum*), funded by the Gordon and Betty Moore Foundation's Marine Microbiology Initiative. Partner - November 2015- May 2018.

EMBRIC (European Marine Biological Research Infrastructure Cluster to promote the Blue Bioeconomy). Work Package leader for the WP “Microalgae for blue biotechnological applications” - June 2015- May 2019.

Marie Curie Career Integration Grant GyPSy- A forward genetic screen in the marine planktonic diatom *Pseudo-nitzschia multistriata*. PI – September 2011- August 2015.

People-MCA-COFUND TuPRE. Supervisor and scientific coordinator of the Marie Curie Cofund fellowship to A. Amato, September 2014-August 2016.

Progetto Bandiera RITMARE – Italian National Project, coordinating an action and a unit focused on the study of marine turbulence– 2012-2016.

Lifewatch-Italy, Call for interdisciplinary research projects at the distributed Laboratory of "Molecular Biodiversity"- *An investigation of the genetic basis of toxin production in the diatom*

*species Pseudo-nitzschia multistriata*, awarded 20.000 euros for sequencing. 2014.

ASSEMBLE Fellowship for a short visit to the Sven Lovén Centre for Marine Sciences in Tjärnö, Sweden, for the project “Gene expression changes in diatoms responding to copepods cues”. August 2014.

- PhD supervisor of six PhD students (director of studies or internal supervisor), supervisor of five Master students and seven Postdoctoral researchers (past and present).
- Member of the Stazione Zoologica (SZN)/Open University (OU) PhD Commission, 2010-2014 (organisation of the training activities required by the OU Programme).

## **Publications**

### **Peer-reviewed**

- Santin Anna, Caputi Luigi, Longo Antonella, Chiurazzi Maurizio, Ribera d'Alcalá Maurizio, Russo Monia Teresa, Ferrante Maria Immacolata\*, Rogato Alessandra\*. Integrative -omics identification, evolutionary and structural analysis of low affinity nitrate transporters in diatoms, diNPFs. Open Biology 11: 200395. 2021. <https://doi.org/10.1098/rsob.20.0395>. \*Corresponding authors
- Monia Teresa Russo\*, Maria Valeria Ruggiero, Francesco Manfellotto, Victoria Scriven, Lisa Campbell, Marina Montresor\* and Maria Immacolata Ferrante\*. New alleles in the mating type determination region of West Atlantic strains of *Pseudo-nitzschia multistriata*. Harmful Algae 103, 101995. 2021. <https://doi.org/10.1016/j.hal.2021.101995> \*Shared corresponding
- Rossella Annunziata\*, Cecilia Balestra, Pina Marotta, Antonella Ruggiero, Francesco Manfellotto, Giovanna Benvenuto, Elio Biffali, Maria Immacolata Ferrante\*. An optimised method for intact nuclei isolation from diatoms. 2021 Jan 18;11(1):1681. doi: 10.1038/s41598-021-81238-z \*Shared corresponding
- F. Manfellotto\*, G.R. Stella, A. Falciatore, C. Brunet, M.I. Ferrante\*. Engineering the Unicellular Alga *Phaeodactylum tricorutum* for Enhancing Carotenoid Production. Antioxidants 2020, 9 (8), 757. doi:10.3390/antiox9080757 \*Corresponding authors.
- Fiorini F., Borgonuovo C., Ferrante M.I.\*, Broenstrup M.\* A metabolomics exploration of the sexual phase in the marine diatom *Pseudo-nitzschia multistriata*. Marine Drugs 2020, 18(6), 313; <https://doi.org/10.3390/md18060313> \*Shared corresponding and shared last authorship
- Cristina Maria Osuna-Cruz, Gust Bilcke, Emmelien Vancaester, Sam De Decker, Nicole Poulsen, Petra Bulankova, Bram Verhelst, Sien Audoor, Darja Stojanovova, Aikaterini Pargana, Monia Russo, Frederike Stock, Emilio Cirri, Georg Pohnert, Per Winge, Atle Bones, Gwenael Piganeu, Maria Immacolata Ferrante, Thomas Mock, Lieven Sterck, Koen Sabbe, Lieven De Veylder, Wim Vyverman and Klaas Vandepoele. The *Seminavis robusta* genome provides insights into the evolutionary adaptations of benthic diatoms. Nature Communications. 11:3320, 2020. <https://doi.org/10.1038/s41467-020-17191-8>
- Pelusi Angela, Margiotta Francesca, Passarelli Augusto, Ferrante Maria Immacolata, Ribera d'Alcala Maurizio, Montresor Marina. Density-dependent mechanisms regulate spore formation

in the diatom *Chaetoceros socialis*. Limnology and Oceanography Letters. 2020.  
<https://doi.org/10.1002/lol2.10159>

- Alessandra Gallo, Marco Guida, Giovanna Armiento, Antonietta Siciliano, Federica Carraturo, Nicolina Mormile, David Pellegrini, Lorenzo Morroni, Elisabetta Tosti, Maria Immacolata Ferrante, Marina Montresor, Flavia Molisso, Marco Sacchi, Roberto Danovaro, Giovanni Libralato. Species-specific sensitivity of three microalgae to sediment elutriates. Marine Environmental Research. Volume 156, 104901. 2020.  
<https://doi.org/10.1016/j.marenvres.2020.104901>
- Angela Pelusi, Flavio Rotolo, Alessandra Gallo, Maria Immacolata Ferrante, Marina Montresor. Effects of elutriates from contaminated coastal sediments on different life cycle phases of planktonic diatoms. Marine Environmental Research. Volume 155, 2020.  
<https://doi.org/10.1016/j.marenvres.2020.104890>
- Aikaterini Pargana, Francesco Musacchia, Remo Sanges, Maria I. Ferrante, Chris Bowler and Adriana Zingone. Intraspecific diversity in the cold stress response of transposable elements in the diatom *Leptocylindrus aporus*. Genes. 2020, 11, 9; doi:10.3390/genes11010009.
- Greta Busseni, Fabio Rocha Jimenez Vieira, Alberto Amato, Eric Pelletier, Juan J. Pierella Karlusich, Maria I. Ferrante, Patrick Wincker, Alessandra Rogato, Chris Bowler, Remo Sanges, Luigi Maiorano, Maurizio Chiurazzi, Maurizio Ribera d'Alcalà, Luigi Caputi, Daniele Iudicone. Meta-omics reveals genetic flexibility of diatom nitrogen transporters in response to environmental changes. 2019. Molecular Biology and Evolution. DOI: 10.1093/molbev/msz157/5525704
- Maria I. Ferrante\*, Laura Entrambasaguas, Mathias Johansson, Mats Töpel, Anke Kremp, Marina Montresor and Anna Godhe. Exploring molecular signs of sex in the marine diatom *skeletonema marinoi*. Genes. 2019, 10, 494; doi:10.3390/genes10070494.
- Lauritano C, Ferrante MI\*, Rogato A\*. Marine Natural Products from Microalgae: An -Omics Overview. Marine Drugs. 2019; 17(5):269. DOI: 10.3390/md17050269. \*Corresponding authors.
- Adelfi MG, Vitale RM, d'Ippolito G, Nuzzo G, Gallo C, Amodeo P, Manzo E, Pagano D, Landi S, Picariello G, Ferrante MI, Fontana A. Patatin-like lipolytic acyl hydrolases and galactolipid metabolism in marine diatoms of the genus *Pseudo-nitzschia*. BBA - Molecular and cell biology of lipids. 2019 Feb;1864(2):181-190. DOI: 10.1016/j.bbalip.2018.11.008
- Russo MT, Vitale L, Entrambasaguas L, Anestis K, Fattorini N, Romano F, Minucci C, De Luca P, Biffali E, Vyverman W, Sanges R, Montresor M, Ferrante MI. *MRP3* is a sex determining gene in the diatom *Pseudo-nitzschia multistriata*. Nature Communications 2018, 9:5050. DOI: 10.1038/s41467-018-0749.
- Russo MT, Sanseverino W, Aiese Cigliano R, Ferrante MI. Assessment of genomic changes in a CRISPR/Cas9 *Phaeodactylum tricornutum* mutant through whole genome resequencing. PeerJ 6:e5507; 2018. DOI 10.7717/peerj.5507
- Kroth PG, Bones AM, Daboussi F, Ferrante MI, Jaubert M, Kolot M, Nymark M, Río Bártulos C, Ritter A, Russo MT, Winge P, Falciatore A. Genome editing in diatoms: achievements and goals. Review. Plant Cell Reports. 37:1401–1408.; DOI: 10.1007/s00299-018-2334-1

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- Amato A, Sabatino V, Nylund GM, Bergkvist J, Basu S, Andersson MX, Sanges R, Godhe A, Kiørboe T, Selander E, Ferrante MI. Grazer-induced transcriptomic and metabolomic response of the chain-forming diatom *Skeletonema marinoi*. *The ISME Journal*, 12, 1594–1604, 2018. DOI:10.1038/s41396-018-0094-0
- Ruggiero MV, D’Alelio D, Ferrante MI, Santoro M, Vitale L, Procaccini G, Montresor M. Clonal expansion behind a marine diatom bloom. *The ISME Journal*, 2018 Feb;12(2):463-472; DOI:10.1038/ismej.2017.181.
- Nanjappa D, Sanges R, Ferrante MI, Zingone A. Diatom flagellar genes and their expression during sexual reproduction in *Leptocylindrus danicus*. *BMC Genomics* (2017) 8:813 DOI: 10.1186/s12864-017-4210-8.
- Amato A, Dell’Aquila G, Musacchia F, Annunziata R, Ugarte A, Maillet N, Carbone A, Ribera d’Alcalà M, Sanges R, Iudicone D, Ferrante MI. Marine diatoms change their gene expression profile when exposed to microscale turbulence under nutrient replete conditions. *Scientific Reports* 2017. 7, 3826. DOI:10.1038/s41598-017-03741-6
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exploration of meiosis-specific SPO11 and RAD51 homologs in the sexual species *Pseudo-nitzschia multistriata* and *Seminavis robusta*. BMC Genomics. 2015;16:930. doi: 10.1186/s12864-015-1983-5

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- Rogato A\*, Amato A, Iudicone D, Chiurazzi M, Ferrante MI\*, d'Alcalà MR. The diatom molecular toolkit to handle nitrogen uptake. Marine Genomics. 2015. doi:10.1016/j.margen.2015.05.018 \*Corresponding authors.
- Sabatino V, Russo MT, Patil S, d'Ippolito G, Fontana A, Ferrante MI. Establishment of Genetic Transformation in the Sexually Reproducing Diatoms *Pseudo-nitzschia multistriata* and *Pseudo-nitzschia arenysensis* and Inheritance of the Transgene. Marine Biotechnology. 2015; 1–11. doi:10.1007/s10126-015-9633-0
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- Ferrante MI, Barra A, Truong J-P, Banfi S, Disteche CM, Franco B. Characterization of the OFD1/Ofd1 genes on the human and mouse sex chromosomes and exclusion of Ofd1 for the Xpl mouse mutant. *Genomics*. 2003;81: 560–569.
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- Ferrante MI, Ghiani M, Bulfone A, Franco B. IL1RAPL2 maps to Xq22 and is specifically expressed in the central nervous system. *Gene*. 2001;275: 217–221.
- Ferrante MI, Giorgio G, Feather SA, Bulfone A, Wright V, Ghiani M, Selicorni A, Gammaro L, Scolari F, Woolf AS, Sylvie O, Le Marec B, Sue Malcolm S, Winter R, Ballabio A, Franco B. Identification of the gene for oral-facial-digital type I syndrome. *American Journal of Human Genetics*. 2001;68: 569–576.
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