

## Giovanna Romano



Born in Naples (Italy) on 09/07/1959

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**Current Position:** Senior Scientist

**Current Affiliation:**

Marine Biotechnology Department, Stazione Zoologica Anton Dohrn, Napoli (Italy)

**Education/Training/Experience**

Institute and Location	Degree / Function	Year	Field of Study
Higher School, Liceo Ginnasio Gian Battista Vico	Baccalaureate (Maturità classica)	1974-1979	Liceo Classico
Department of Biochemistry, Università di Napoli, Federico II Napoli, Italy	Master (Laurea)	1979-1983	Biological Sciences
Stazione Zoologica Anton Dohrn, Napoli, Italy	Fellowship in Biochemistry	1983-1989	Bioactive peptides from marine organisms
Stazione Zoologica Anton Dohrn, Napoli, Italy	Staff Researcher	1989-2004	Ecophysiology of marine plankton
Stazione Zoologica Anton Dohrn, Napoli, Italy	Senior Investigator (1° Ricercatore)	2004- present	Bioactive secondary metabolites from diatoms
Stazione Zoologica Anton Dohrn, Napoli, Italy	Supervisor Chemical Ecology Laboratory	2015- present	Chemical Ecology Marine Biotechnology

**Research interest:**

In nature, interactions based on chemical signalling often regulate the growth and survival of macro- and micro-organisms, thus determining biological success and influencing the structure of ecosystems and population dynamics. Throughout the course of my research career, I have mostly been interested in the study of marine natural products and their ecological role, focusing in the last decades on chemical signalling in the phytoplankton. I participated in the discovery of the detrimental effect of poly-unsaturated aldehydes that inhibit the emergence of copepod progenies by inducing abortions, malformations and slow development rates, challenging the paradigm of diatom as good food source for their grazers.

My current research focuses on the biological activities of diatom secondary metabolites, assessing their potential for applications in the human health and well-being sectors. We have identified many bioactive microalgal strains, having antioxidant, anti-inflammatory, anti-proliferative, anti-diabetes, and anti-bacterial activities and isolate some of the bioactive compounds they produce. I am currently using –omics approaches to investigate the biosynthetic pathways of compounds of interest for biotechnological applications. This approach led us to identification for the first time in diatoms of the prostaglandin biosynthetic pathway, which suggests their possible role as chemical mediators also in these unicellular organisms.

Principal aims of my research studies are:

- Clarify chemically mediated interactions in the plankton.
- Study the molecular mechanism underlying the effects of diatom-derived metabolites using *in vitro* and *in vivo* model systems.
- Disclose metabolic pathway producing bioactive secondary metabolites in microalgae

- Identify factors affecting the production of bioactive secondary metabolites.
- Discover potential biotechnological applications of microalgal secondary metabolites.

### Students' Supervision

PhD supervisor of 8 Ph.D. students (Open University and Italian PhD program):

Member of 7 international PhD examination panels

### Funding

1. Italian National Project with EU Infrastructure Funds PON01\_00117 Antigens and Adjuvants for Vaccines and Immunotherapy Coordinated by Novartis Vaccines & Diagnostics srl (2011-2015)
2. Italian National Project with Infrastructure Funds PON01\_02093 New Technologies and technological platforms to improve production processes of pharmacologically active molecules from natural sources Coordinated by Sanofi-Aventis S.p.A (2011-2015)
3. Italian National Project with Infrastructure Funds PON 1- 02782 New nanotechnological strategies for pharmaceuticals targeting circulating metastatic cancer cells Coordinated by BIOGEM (2011-2015)
4. Eurofleet Project PHARMADEEP project to collect marine organisms from deep-and-cold-water habitats (5000m in the South Shetland Islands) that may be unique sources of natural products for the treatment of cancer and infectious diseases (2015)
5. EUROMARINE: <http://www.euromarineconsortium.eu/>
6. PHARMASEA European FP7 project KBBE.2012.3.2-01: Innovative marine biodiscovery pipelines for novel industrial products Coordinated by the University of Aberdeen, UK and University of Louven, Belgium <http://www.pharma-sea.eu/>
7. Ocean Medicines European H2020-MSCA-RISE-2015. Coordinated by CNR-IBP Naples, Italy
8. Progetti bilaterali di Grande Rilevanza, paese partner Sudafrica. Genomica per un'Economia Sostenibile (GES) 2018-ongoing

### Technological Transfer

Partner in the SZN-CNR spin-off company BioSEArch srl, founded in 2016 for the development of new pharmaceutical and cosmeceutical compounds from marine microalgae. <https://www.biosearchsrl.com/>

### Patent

"Method and kit to predict cell death pathway activated in response to biotic and/or abiotic stimuli".

Application number: 812019000108834; Presented: 26/08/2019

### Publications

Author of 96 scientific publications in ISI journals and 1 book chapter (h index: 33, according to Google Scholar)

### Peer-reviewed publications of the last 5 years

Ruocco N, Nuzzo G, d'Ippolito G, Manzo E, Sardo A, Ianora A, Romano G, Iuliano A, Zupo V, Costantini M, Fontana A (2020) Lipoxygenase Pathways in Diatoms: Occurrence and Correlation with Grazer Toxicity in Four Benthic Species. *Marine Drugs* 18 (1), 66. <https://doi.org/10.3390/md18010066>

Milito, A.; Murano, C.; Castellano, I.; Romano, G.; Palumbo, A. Antioxidant and immune response of the sea urchin *Paracentrotus lividus* to different re-suspension patterns of highly polluted marine sediments. *Marine Environmental Research* 2020, 160, 104978, doi:[10.1016/j.marenvres.2020.104978](https://doi.org/10.1016/j.marenvres.2020.104978).

Galasso, C.; Celentano, S.; Costantini, M.; D'Aniello, S.; Ianora, A.; Sansone, C.; Romano, G. Diatom-Derived Polyunsaturated Aldehydes Activate Similar Cell Death Genes in Two Different Systems: Sea Urchin Embryos and Human Cells. *International Journal of Molecular Sciences* 2020, 21, 5201, doi:[10.3390/ijms21155201](https://doi.org/10.3390/ijms21155201).

Di Dato V, Barbarinaldi R, Amato A, Di Costanzo F, Fontanarosa C, Perna A, Amoresano A, Esposito F, Cutignano A, Ianora A and Romano G (2020) Variation in prostaglandin metabolism during growth of the diatom *Thalassiosira rotula*. *Scientific Reports*, 10, 5374. <https://doi.org/10.1038/s41598-020-61967-3>

Di Dato V, Ianora A, Romano G (2020) Identification of Prostaglandin Pathway in Dinoflagellates by Transcriptome Data Mining. *Marine Drugs*, 18, 109. <https://doi.org/10.3390/md18020109>

Di Costanzo, F., Di Dato, V., Ianora, A., Romano, G., 2019. Prostaglandins in Marine Organisms: A Review. *Marine Drugs* 17, 428. <https://doi.org/10.3390/md17070428>

- Di Dato, V., Di Costanzo, F., Barbarinaldi, R., Perna, A., Ianora, A., Romano, G., 2019. Unveiling the presence of biosynthetic pathways for bioactive compounds in the *Thalassiosira rotula* transcriptome. *Sci Rep* 9, 9893. <https://doi.org/10.1038/s41598-019-46276-8>
- Galasso, C., D'Aniello, S., Sansone, C., Ianora, A., Romano, G., 2019. Identification of Cell Death Genes in Sea Urchin *Paracentrotus lividus* and Their Expression Patterns during Embryonic Development. *Genome Biol Evol* 11, 586–596. <https://doi.org/10.1093/gbe/evz020>
- Merquiol, L., Romano, G., Ianora, A., D'Ambra, I., 2019. Biotechnological Applications of Scyphomedusae. *Marine Drugs* 17, 604. <https://doi.org/10.3390/md17110604>
- Miceli, M., Cutignano, A., Conte, M., Ummarino, R., Romanelli, A., Ruvo, M., Leone, M., Mercurio, F.A., Doti, N., Manzo, E., Romano, G\*, Altucci, L., Ianora, A., 2019. Monoacylglycerides from the Diatom *Skeletonema marinoi* Induce Selective Cell Death in Cancer Cells. *Marine Drugs* 17, 625. <https://doi.org/10.3390/md17110625>
- Mutalipassi, M., Mazzella, V., Romano, G., Ruocco, N., Costantini, M., Glaviano, F., Zupo, V., 2019. Growth and toxicity of *Halomiconema metazoicum* (Cyanoprokaryota, Cyanophyta) at different conditions of light, salinity and temperature. *Biol Open*. <https://doi.org/10.1242/bio.043604>
- Zupo, V., Mutalipassi, M., Ruocco, N., Glaviano, F., Pollio, A., Langellotti, A.L., Romano, G., Costantini, M., 2019. Distribution of Toxicogenic *Halomiconema spp.* in Adjacent Environments on the Island of Ischia: Comparison of Strains from Thermal Waters and Free Living in *Posidonia Oceanica* Meadows. *Toxins* 11, 99. <https://doi.org/10.3390/toxins11020099>
- Brillatz, T., Lauritano, C., Jacmin, M., Khamma, S., Marcourt, L., Righi, D., Romano, G., Esposito, F., Ianora, A., Queiroz, E.F., Wolfender, J.-L., Crawford, A.D., 2018. Zebrafish-based identification of the antiseizure nucleoside inosine from the marine diatom *Skeletonema marinoi*. *PLoS One* 13, e0196195. <https://doi.org/10.1371/journal.pone.0196195>
- Lauritano, C., Martín, J., Cruz, M. de la, Reyes, F., Romano, G., Ianora, A., 2018. First identification of marine diatoms with anti-tuberculosis activity. *Scientific Reports* 8, 2284. <https://doi.org/10.1038/s41598-018-20611-x>
- Martínez Andrade, K.A., Lauritano, C., Romano, G., Ianora, A., 2018. Marine Microalgae with Anti-Cancer Properties. *Marine Drugs* 16, 165. <https://doi.org/10.3390/md16050165>
- Ruocco, N., Costantini, S., Zupo, V., Lauritano, C., Caramiello, D., Ianora, A., Budillon, A., Romano, G., Nuzzo, G., D'Ippolito, G., Fontana, A., Costantini, M., 2018. Toxicogenic effects of two benthic diatoms upon grazing activity of the sea urchin: morphological, metabolomic and de novo transcriptomic analysis. *Scientific Reports* 8, 5622. <https://doi.org/10.1038/s41598-018-24023-9>
- Sannino, F., Sansone, C., Galasso, C., Kildgaard, S., Tedesco, P., Fani, R., Marino, G., Pascale, D. de, Ianora, A., Parrilli, E., Larsen, T.O., Romano, G\*, Tutino, M.L., 2018. *Pseudoalteromonas haloplanktis* TAC125 produces 4-hydroxybenzoic acid that induces pyroptosis in human A459 lung adenocarcinoma cells. *Scientific Reports* 8, 1190. <https://doi.org/10.1038/s41598-018-19536-2>
- Núñez-Pons, L., Avila, C., Romano, G., Verde, C., Giordano, D., 2018. UV-Protective Compounds in Marine Organisms from the Southern Ocean. *Marine Drugs* 16, 336. <https://doi.org/10.3390/md16090336>
- Sansone, C., Nuzzo, G., Galasso, C., Casotti, R., Fontana, A., Romano, G., Ianora, A., 2018. The Marine Dinoflagellate *Alexandrium andersoni* Induces Cell Death in Lung and Colorectal Tumor Cell Lines. *Mar Biotechnol* 20, 343–352. <https://doi.org/10.1007/s10126-018-9817-5>
- Torres-Águila, N.P., Martí-Solans, J., Ferrández-Roldán, A., Almazán, A., Roncalli, V., D'Aniello, S., Romano, G., Palumbo, A., Albalat, R., Cañestro, C., 2018. Diatom bloom-derived biotoxins cause aberrant development and gene expression in the appendicularian chordate *Oikopleura dioica*. *Communications Biology* 1, 121. <https://doi.org/10.1038/s42003-018-0127-2>
- Costantini, S., Guerriero, E., Teta, R., Capone, F., Caso, A., Sorice, A., Romano, G., Ianora, A., Ruocco, N., Budillon, A., Costantino, V., Costantini, M., 2017. Evaluating the Effects of an Organic Extract from the Mediterranean Sponge *Geodia cydonium* on Human Breast Cancer Cell Lines. *International Journal of Molecular Sciences* 18, 2112. <https://doi.org/10.3390/ijms18102112>
- Di Dato, V., Orefice, I., Amato, A., Fontanarosa, C., Amoresano, A., Cutignano, A., Ianora, A., Romano, G., 2017. Animal-like prostaglandins in marine microalgae. *The ISME Journal* 11, 1722–1726. <https://doi.org/10.1038/ismej.2017.27>
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- Ruocco, N., Costantini, S., Zupo, V., Romano, G., Ianora, A., Fontana, A., Costantini, M., 2017a. High-quality RNA extraction from the sea urchin *Paracentrotus lividus* embryos. *PLOS ONE* 12, e0172171. <https://doi.org/10.1371/journal.pone.0172171>
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- Lauritano, C., Carotenuto, Y., Vitiello, V., Buttino, I., Romano, G., Hwang, J.-S., Ianora, A., 2015a. Effects of the oxylipin-producing diatom *Skeletonema marinoi* on gene expression levels of the calanoid copepod *Calanus sinicus*. *Marine Genomics* 24, 89–94.
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