

LAURA CANESI

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CURRICULUM VITAE

Born in Genoa, Italy, 29/03/1960. 1985: Ms in Natural Sciences, University of Genoa. 1988: PhD. In Marine environmental Sciences. Full Professor of Physiology at the Dept. Of Earth, Environment and life Sciences-DISTAV, Genoa University.

Leader of the Environmental Physiology group at DISTAV. Coordinator of the BS and MD courses in Natural and Environmental Sciences. Long-standing experience in research and teaching in environmental and comparative physiology and immunology.

Teaching activities:

- Courses of Animal Physiology, Environmental physiology, Physiology of marine organisms, Environmental endocrinology, Biomarkers of environmental stress, Fundamentals of Ecotoxicology, for BS in Biological Sciences and in Environmental Sciences, and Master degrees in Biomonitoring, in Marine Sciences, Marine Biology.
- Member of the Board of Teachers of the Ph.D. Course in Environmental Science (Urbino University, 2001-2011) and of Ph.D. Course in Marine Science (Genoa University, 2012-present))
- Member of the Board of Teachers of II level Master degrees of the Genoa University ('Environmental Monitoring', 'Biotechnology and advanced technologies applied to aquaculture', 'Management of chemicals within the REACH').
- 2013: Coordinator of the 'School of Environmental Physiology' held in Alessandria, Università del Piemonte Orientale, in collaboration with the Italian Society of Physiology and the new European Society of Comparative Physiology and Biochemistry.

Research activity:

Since her Ph.D. in Marine Environmental Sciences, the research activity focused on the physiology of marine organisms, invertebrates in particular, in relation to both environmental and comparative aspects. The physiological regulation of functions in response to endogenous and environmental signals has been studied at different levels of biological organization, and in a comparative perspective. In particular, the effects and mechanisms of action of inorganic and organic contaminants have been investigated with the aim of identifying and quantifying the responses to chemical exposure from molecular to organism level. The results have potential applications in environmental and human health. These studies, carried out in collaboration with several national and foreign scientific institutions, have been presented to more than 200 congresses and have been published in over 100 peer-reviewed journals, book chapters, full scientific reports).

ORCID ID: <http://orcid.org/0000-0003-2061-3819>; Scopus Author ID: 7003351671 (H-index 46, 6267 citations)

126 publications; sum of citations: 5.989; average citations/item: 47,53; h index: 44.

Main research topics:

1. homeostasis of essential metals in marine organisms. Main results: role of metallothioneins and lysosomes and balance between pro-oxidant and anti-oxidant systems in Zn and Cu homeostasis. Effects and mechanisms of action of Cr on innate immunity and metabolism.
2. comparative studies on antioxidant defences in marine organisms. Main results: identification of the main antioxidant systems in relation to the physiological status and to different environmental conditions, including exposure to metal cations.

3. Calcium homeostasis in the cells of aquatic organisms. Main results: mechanisms involved in intracellular [Ca²⁺] transients in response to hormones and metal cations.
4. effects of heterologous growth factors (EFG, IGF-I, insulin) in the cells of aquatic invertebrates and vertebrates. Main results : Role of [Ca²⁺] transients and intracellular kinase cascades (MAPK/STAT) in determining metabolic effects. Conservation of the intracellular signaling pathways involved in the cellular response to peptide hormones.
5. Mechanisms of cell-mediated immunity and related transduction pathways in bivalve immunocytes. Surface interactions between hemocytes and bacteria, role of soluble hemolymph components, activation of signal transduction pathways leading to immunomodulation. Main results: Identification of the key signaling components involved (MAPK, PKC, JNK, STAT, CREB) in activation of innate immunity.
6. Effects of natural and environmental estrogens on mussel immunocytes and digestive gland cells. Main results: identification of rapid non genomic pathways in mussel immunocytes and of target genes in the dig. gland. Application of the integrated approach biomarkers/transcriptomic analysis to evaluate the in vivo effect of estrogens, alone and in combination with organic contaminants, in mussels.
7. Liver lipid homeostasis in mammalian models (in vitro and in vivo studies). Hepatic steatosis, antisteatotic effects of thyroid hormones (THs). Main results: modulation by THs of expression of genes involved in lipid homeostasis and in antioxidant defences.
8. Effects and mechanisms of action of emerging contaminants (pharmaceuticals, endocrine disruptors) in marine bivalves. Main results: identification of lysosomal function, innate immunity, and embryo development as main targets for different chemicals.
9. Effects and mechanisms of action of nanomaterials (NMs) in marine invertebrates; Main results: identification of bivalve molluscs as significant targets for the action of NM through interference with physiological processes (immune and lysosomal function, pro-oxidant processes) from the molecular to organism level. Effects on microbiome; effects on larval development. At the cellular level, the effect of NMs has been investigated in invertebrate and mammalian models.

Other scientific activities

- Peer reviewer of national (PRIN) e international projects (Agence nationale de la Recherche FR; Swiss National Research Foundation, CH; National Research Council, UK).
- Peer reviewer of international journals (es: Comp. Biochem. and Physiol., Am. J. Physiol., PlosOne, Biol. Cell. BBActa, Devel. Comp. Immunol., Fish and Shellfish Immunol., Biomarkers, Aquat. Toxicol., Chemosphere, Sci. Tot. Environ., Environ. Sci. Technol.).
- Participant in the scientific committees of international congresses (PRIMO Conference-Pollutant Responses in Marine Organisms, ESCPB European Conference of the Society of Comparative Biochemistry and Physiology, CECE-European Conference of Comparative Endocrinologists).
- Member of the working group: 'Immunosafety Focus Group' dell' EU Nanosafety Cluster . <http://www.nanosafetycluster.eu/working-groups/2-hazard-wg/immunosafety/>
- Member of the OECD Working Party on Manufactured Nanomaterials (WPMN).
- Invited speaker at national (Istituto superiore di Sanità, Istituto nazionale Biofisica e biosistem) and international congresses (4th-6th Bilateral Seminar Italy-Japan: Physical and Chemical Impacts on Marine Organisms 2011 and 2014; 2nd e 3rd NanoImpactNet Conference, Lausanne, 2010 and 2011: Building a bridge from NanoImpactNet to nanomedical research; European Science Foundation-EMBO conference: Interaction Between the Immune System and Nanomaterials: Safety and Medical Exploitation, 2015).

Grants

- PRIN2007: leading researcher of the UNIGE unit 'Utilization of the integrated approach biomarker/proteomics genomics in the evaluation of the responses of the marine bivalve *Mytilus* to environmental contaminants. Italian Ministry of Research. 20079FELYB_002.
- PRIN2009: leading researcher of the UNIGE unit: ' The bivalve *Mytilus* as a model for studying the effects of nanoparticles in marine invertebrates: responses from the molecular to the organism level'. Italian Ministry of Research 2009FHHP2W_002

- 2006-2009: subcontract CNRS 009252 (Universite de Montpellier) within FP6 IMAQUANIM Improved Immunity for aquacultured animals' (Area T6.4, project n. 007103) (Research, Technology Development and Demonstration). <http://imaquanim.dfvf.dk>
- 2006-2010: Component of the UNIGE unit within the FP6 NUTRIDENT (STREP, Thematic Priority: "Food Quality and Safety", Thematic call: "Impact of food on health", "Food components reducing the risk of dental diseases"-STREP). <http://www.ucl.ac.uk/eastman/nutrient/index.php>
- 2011-2014: Component of the UNIGE unit within the FP7, BIVALIFE Controlling infectious diseases in oysters and mussels in Europe, FP7-KBBE-2010-4 Improving European mollusc aquaculture: disease detection and management. <http://wwz.ifremer.fr/bivalife>.
- 2016-2018: Current research projects 2015: ISTITUTO ZOOPROFILATTICO SPERIMENTALE DEL PIEMONTE, LIGURIA E VALLE D'AOSTA: IZS PLV 07/15 RC. Anomalous mortalities of *Mytilus galloprovincialis* in relation to environmental stressors: evaluation of immune status, role of pathogens, utilization of biomarkers for monitoring the health status of aquacultured mussels.
- 2016-2019: Component of the UNIGE unit within the EU project VIVALDI (Preventing and mitigating farmed bivalve disease). Work Programme 2014-2015, H2020 Specific Programme for Societal Challenge 2: Food security, sustainable agriculture, marine and maritime research and the bioeconomy.
- 2015-2019: leading researcher of the UNIGE unit within the EU project 671881, Marie Curie International Training Network (H2020-MSCA-ITN), PANDORA: Probing safety of nano-objects by defining immune responses of environmental organisms.
- 2016-18 Principal Coordinator Italian National Research Project in Antarctica PNRA: 'Nanoparticelle polimeriche nell'ambiente marino e negli organismi Antartici (NanoPANTA)" PNRA16_00075.
- 2017-2018 Scientific Coordinator Project Centre National de Ressources Biologiques Marines EMBRC-France n° OOV-AAP 2018-2161. MERMAIDS: Impact of eMERging contaminants on *Mytilus galloprovincialis* early embryo biomineralization in the context of ocean acidification.