



University of Genova

Department of Earth, Environmental
and Life Sciences

Doctorate Course in Earth and
Environmental Science and
Technology

Università degli Studi di Genova



Dottorato in Scienze e Tecnologie
per l'Ambiente e il Territorio

Curriculum in biology applied to agriculture and the environment

Research Theme n. 1

Titolo

“Valutazione degli effetti e dei meccanismi molecolari coinvolti nell’azione citoprotettiva di molecole bioattive sul metabolismo e la struttura cellulare mediante utilizzo di modelli cellulari”

Title

“Evaluation of the effects and molecular mechanisms involved in the cytoprotective action of bioactive molecules on cell metabolism and structure using in vitro models”

Tutor

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Co-tutor

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Program description including the formation program abroad

The project aims to train qualified researchers in the field of molecular/cellular physiology focusing on the characterization of bioactive biological compounds and on the investigation of the mechanisms of their activity on cell function and structure. In particular, the biological effects will be investigated in terms of cell metabolism changes and remodeling of chromatin structure.

Among the bioactive compounds, a special interest will focus on phytochemicals and endogenous compounds for their possible application as dietary supplements, superfood and nutraceuticals.

Phytochemical analyses and biological and biophysical assays will be carried out with the support and collaboration of other Italian Universities and Research Institutions with whom our team has a long-standing and fruitful collaboration (University Aldo Moro of Bari; Istituto Italiano di Tecnologia – II and DIMES of University of Genova).

For the experimental activity the following techniques will be used: in vitro cell culture; molecular and cell biology techniques; Fluorescence (Confocal and STED) microscopy; Image analysis; Spectrophotometry and Fluorimetry; HPLC (high performance liquid chromatography), and GC-MS (gas chromatography-mass spectrometry).

Given the multidisciplinary approach of the research, periods of mobility are foreseen inside the collaboration with national Universities and Institutions. In addition, a period of 3-6 months in qualified foreign institutions may also be envisaged, to study specific topics related to the PhD project.

The research will be conducted in the frame of EU H2020 PRIMA (Partnership for Research and Innovation in the Mediterranean Area) Section 2, 2022 “Box for Health by Tradition & innovation: promoting sustainable Mediterranean diet by Healthy Foods (B4HT)” of which the proponent is PI of the winning Consortium.

Financial support: Tutors' departmental research funds

Tutor's publications of the last 3 years

- F. Diab, D. Beghelli, A. Nuccitelli, G. Lupidi, M. Khalil, P. Portincasa **and L. Vergani** "Supplementation with *Thymbra spicata* extract ameliorates lifespan, body-weight gain and Paraquat-induced oxidative stress in *Drosophila melanogaster*: an age- and sex-related study" Journal of Functional Foods 114, 106078, **2024** (DOI.org/10.1016/j.jff.2024.106078)
- Baldini F, Lama Z., Diab F, Portincasa P, Pagano A., Diaspro A **and Vergani L.** "Nuclear and chromatin rearrangement in a model of in vitro adipogenesis and hypertrophy are associated to epigenome and gene expression changes" Biochimica et Biophysica Acta-Molecular and Cell Biology of Lipids, 1868, 10, October, **2023** (DOI:/10.1016/j.bbalip.2023.159368)
- Baldini F, Diab F, Serale N, Zeaiter L, Portincasa P, Diaspro A **and Vergani L.** "Adipocyte-hepatocyte crosstalk in cellular models of obesity: role of soluble factors" Life Sciences, 317, 15 March 121464, **2023** (DOI:/10.1016/j.lfs.2023.121464)