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DELLE MARCHE

**Anticancer effects of dietary bioactive
compounds in mammospheres and
colonspheres enriched with Cancer
Stem (-like) Cells**

Supervisor: Prof. Maurizio Battino

Department of Odontostomatologic and
Specialized Clinical Sciences-
<https://www.disco.univpm.it/>



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Supervisor: Prof. Maurizio Battino

Research Group Description: the Supervisor



Prof. Maurizio Battino, PhD, DSc, MS, MD (Hon).

Full Professor in Nutrition and Dietetics, DISCO, UNIVPM Head of Bioenergetic Lab, a facility based in the Faculty of Medicine, Marche Polytechnic University, Ancona.

Guest Professor at Jiangsu University, Zhengjiang, China, Director of two Research Centers at European University of the Atlantic, Santander, Spain and at Universidad Internacional Iberoamericana, Campeche, Mexico.

More than 430 peer-reviewed research articles with about 25,000 citations received <https://orcid.org/0000-0002-7250-1782> ([Publication List](#), H-index = 88 according to Google Scholar; H-index = 71 according to Scopus). More than 30 years of experience in bioenergetics, nutritional biochemistry and food research with special emphasis on the role of natural bioactive compounds.

Awarded **Doctor Honoris Causa** from University Carol Davila, Bucharest, Romania and named a Thomson Reuters/Clarivate Analytics **Highly Cited Researcher** and listed in the World's Most Influential Scientific Minds during the last 8 consecutive years.

Involved in several national and international projects.

- European fundings:
 - 2023-2026: "Microbial resources for a sustainable olive oil system and a healthier Mediterranean food: from by-products to functional food" (**PRIMA** project).
 - 2011-2014: "The sustainable improvement of European berry production, quality and nutritional value in a changing environment: Strawberries, Currants, Blackberries, Blueberries and Raspberries" (**H2020**, EUBerry Project: EU FP7 KBBE-2010-4 Grant Agreement No. 265942).
- National fundings:
 - 2023-2025: Proof of Concept PNRR VALUE "CREME naturali a base di BERRIES per la protezione della pelle dallo stress ossidativo e dai raggi UV" funded by the Italian Ministry of Economic Development.
 - 2023-2025: "Anthocyanin rich adjuvants against dysbiosis and chronic inflammation in metabolic syndrome patients". PRIN project funded by the Italian Ministry of University and Research.
 - 2020-2022: Proof of Concept "FRAGole Per donne Più Sane – FRAPPE", funded by the Italian Ministry of Economic Development.
 - 2018-2020: "Effect of berry consumption on ovarian cancer prevention: the epigenetic role of dietary polyphenols" (UnivPM Strategic Project).
 - 2013-2015: "Cell cycle aberrations and oxidative stress in age related neurodegenerative disease: The role of food antioxidants" Cooperazione Scientifica e Tecnologica, Ministero Affari esteri, Executive Programme Italy/Republic of Serbia.



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Bioenergetics Lab

https://twitter.com/Bio_Lab_UNIVPM

STAFF: The group is currently formed by a full Professor, Researcher, a post-doc researcher, five PhD students and two master students.



RESEARCH ACTIVITY

The main research lines of the Bioenergetic Lab focus on the evaluation of the biological effects exerted by different bioactive compounds present in many food matrices in several *in vitro* (fibroblasts, breast/colon/liver cancer cells, macrophages, adipocytes), *ex vivo* (red blood cells and white blood cells) and *in vivo* (mice, rats and humans) experimental models. Targeted diseases are those related with oxidative stress and inflammation, such as aging, cancer, obesity and cardiovascular diseases, with the aim to highlight the molecular mechanisms involved in the beneficial effects exerted by these food matrices.



EQUIPMENT

Benchtop centrifuges; Chemical hoods; Biosafety 1 and 2 biological hoods; Autoclave; Basic laboratory equipment (analytical balance, freezer, grinder, etc.); Water purification system; Rotavapor; Cell incubator; Microplate reader; Flow cytometry; PCR apparatus; Western Blot system; Seahorse XF 24 Extracellular Flux Analyzer; HPLC; Multimodal microplate reader; Fluorescent microscope.

RESEARCH AND PUBLICATIONS

<https://orcid.org/0000-0002-8151-9132>
<https://orcid.org/0000-0002-8781-3535>
<https://orcid.org/0000-0003-2772-2225>

Dept. Clinical Sciences– DISCO
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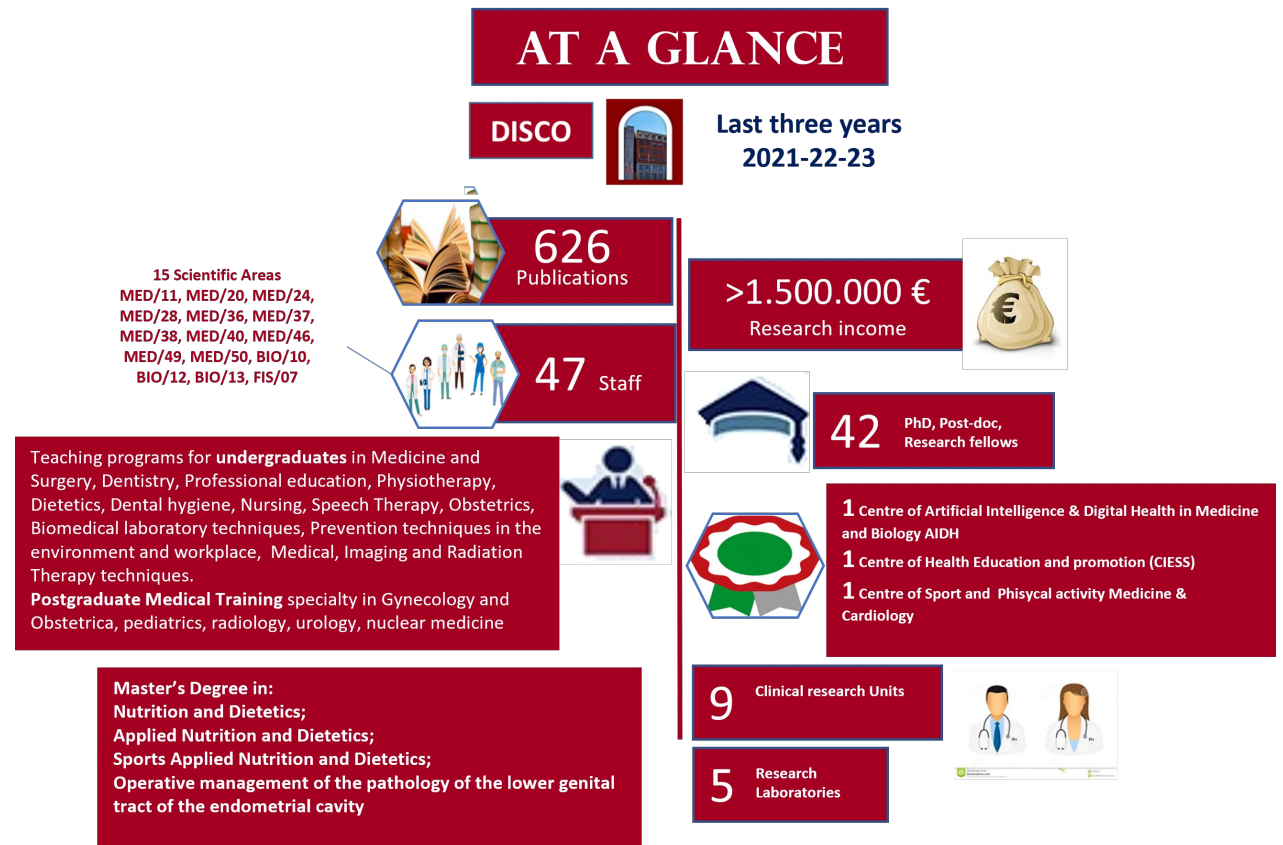
The Department of Odontostomatologic and Specialized Clinical Sciences

Director: Prof. Andrea Giovagnoni

The Department of Odontostomatologic and Specialized Clinical Sciences is the scientific and educational organizational structure of the UNIVPM University established in 2008, devoted to the promotion of scientific research, education and the dissemination of scientific research results in the community.

Its main objectives are to plan, organize and regularly evaluate the quality of research activity carried out in the scientific fields and disciplines under its competence; to plan, organize and manage the first-level and master's courses of the Faculty of Medicine; and, finally, to provide cultural and educational activities and contribute to training and orientation activities based on the needs of students in cooperation with the Medical Association.

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Project Idea: ANTICANCER EFFECTS OF DIETARY BIOACTIVE COMPOUNDS IN MAMMOSPHERES AND COLONSOPHERES ENRICHED WITH CANCER STEM (-LIKE) CELLS

Background: Breast and colon cancer represent the most common neoplastic disease worldwide. Many epidemiological studies have found that a diet rich in fruits and vegetables exerts a preventive role in these cancers and, from a preventive point of view, numerous investigations have been made on plant bioactive compounds. The main objective of this project is to evaluate the effect of dietary polyphenols in mammospheres and colonspheres enriched with Cancer Stem (-like) Cells (CSCs-like).

Project OBJECTIVES:

- To evaluate the ability of dietary polyphenols to decrease the morphological and physical parameters of mammo/colonspheres enriched with CSCs-like.
- To investigate the effect of dietary polyphenols on intracellular ROS and apoptotic rate in mammo/colonspheres enriched with CSCs-like.
- To evaluate the effect of dietary polyphenols to decrease the self-renewal ability of CSCs-like.
- To investigate the effect of dietary polyphenols to reduce the migration capacity of CSCs-like.
- To assess the effect of dietary polyphenols on pro-angiogenic factors.
- To study the effect of dietary polyphenols on the length of telomeres.

