Transition to new technologies in the field of "*in vitro*" cytotoxicity testing

Prof. Tatiana Armeni

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Total number of publications: 63

- Scientific head of the Cell Biology and Molecular Genetics research group of the Department of Odontostomatologic and Specialized Clinical Sciences of the UNIVPM.

- Referent for the Ancona research unit of the Italian research network for Cerebral Cavernous Malformations.

- Lecturer trainer for the Ministry of Education in the National Plan for Teacher Training (PNFD), Special Project School University, within the theme: Scientific-Technological Disciplines (STEM).

-Member of the Editorial Board of International Journal of Molecular Sciences (ISSN 1422-0067), published by MDPI, Basel, Switzerland.

-Member of the Editorial Board of Encyclopedia (ISSN 1422-0067), published by MDPI, Basel, Switzerland.

-Guest editor of the special issue entitled "Glutathione in Health and Disease" in the journal Antioxidants. https://www.mdpi.com/journal/ antioxidants/special_issues/ Glutathione_ Diseases

-Guest editor of the special issue entitled "Assessment Methods for Antioxidants Activity and Oxidative Stress" in the International Journal of Molecular Sciences https://www.mdpi.com/journal/ijms/ special_issues/antioxidants_ oxidative _stress

-Reviewer for several international indexed scientific journals.

- Member of the 3R interuniversity Center

-Member of the Italian Association of General and Molecular Biology and Genetics (AIBG).

-Member of the International Society of Antioxidants in Nutrition and Health (ISANH).

Funds obtained on competitive calls:

- Ministry of University and Research, PRIN 2022-24 Prog. 2022TZCZ8R. Head of the University Research Unit: Tatiana Armeni.

-Ministry of Health, Finalised Research 2018-21 Head of the University Research Unit: Tatiana Armeni.

-TELETHON 2015-17 Head of the support group of the Ancona Research Unit: Tatiana Armeni.

- Ministry of University and Research, PRIN 2017-19 Prog. 2017HRTZYA. Collaborator: Tatiana Armeni.

-Cystic Fibrosis Research Foundation, Prog. FFC#11/2016. Collaborator: Tatiana Armeni.

-Participation in the UNIVPM University Strategic Project (2017-2019).

-Reference for a scientific collaboration agreement with LioDry Foods Company for the project "Naturally occurring compounds and epigenetic effects" (2018).

Supervisor: Prof. Tatiana Armeni

Research Group Description: the Group

Laboratory of Cell Biology and Molecular Genetics (LBGM)

The research group has extensive experience in the field of drug and xenobiotic testing in cell cultures and the evaluation of cytotoxicity in "*in vitro*" systems. Numerous studies have been conducted on molecular redox signaling that influences cellular responses under physiological and disease conditions. In the field of redox biology, the group has experience in the evaluation of antioxidant enzymes, glutathione metabolism, and the study of redox signaling associated with perturbations of metabolic pathways. In general, by means of enzyme assays, chromatography, western blot, real-time PCR, cytofluorimetry, and fluorescence microscopy multiple parameters (cell viability, proliferation, apoptosis, cell cycle, inflammatory parameters, repair capacity, and other specific parameters concerning the activation of certain metabolic pathways) are routinely determined on also high complexity cell systems.
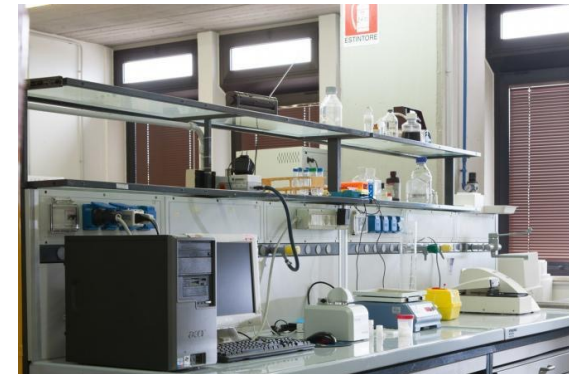
The Department of Odontostomatologic and Specialized Clinical Sciences
Director: Prof. Andrea Giovagnoni

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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.

https://www.disco.univpm.it/

AT A GLANCE

DISCO

Last three years 2021-22-23

626 Publications

15 Scientific Areas
MED/11, MED/20, MED/24, MED/28, MED/36, MED/37, MED/38, MED/40, MED/46, MED/49, MED/50, BIO/10, BIO/12, BIO/13, FIS/07

47 Staff

>1.500.000 € Research income

42 PhD, Post-doc, Research fellows

Teaching programs for **undergraduates** in Medicine and Surgery, Dentistry, Professional education, Physiotherapy, Dietetics, Dental hygiene, Nursing, Speech Therapy, Obstetrics, Biomedical laboratory techniques, Prevention techniques in the environment and workplace, Medical, Imaging and Radiation Therapy techniques.
Postgraduate Medical Training specialty in Gynecology and Obstetrica, pediatrics, radiology, urology, nuclear medicine

1 Centre of Artificial Intelligence & Digital Health in Medicine and Biology AIDH
1 Centre of Health Education and promotion (CIESS)
1 Centre of Sport and Phisycal activity Medicine & Cardiology

Master's Degree in:
Nutrition and Dietetics;
Applied Nutrition and Dietetics;
Sports Applied Nutrition and Dietetics;
Operative management of the pathology of the lower genital tract of the endometrial cavity

9 Clinical research Units

5 Research Laboratories

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In recent years, also following specific EU directives, robust "*in vitro*" experimental models have been developed to predict potential adverse effects associated with the exposure of organisms or biological systems to compounds including human drugs but also cosmetics, biocides, medical devices and other products.

The scientific community has relied on the principles of the 3Rs (Replacement, Reduction and Refinement) in the transition from animal models to "in vitro" models. To date, advanced technologies for developing increasingly complex "in vitro" models are available and evolving, breaking down limitations of animal models, such as difficult extrapolation between species, high cost, artifacts in addition to ethical questions.

The project aims at the advancement of knowledge in cytotoxicology to implement strengthen and validate cytotoxicity assays and flow the information to available innovative high throughput platforms. The research group has extensive experience in "*in vitro*" systems on 2D or 3D cell models where to perform advanced cytotoxicity assays, redox signaling, efficacy assessment and cellular response. Implementation of "*in vitro*" cytotoxicity testing and validation of highly innovative systems could provide a data set to be extrapolated for training an AI bioinformatics system..