Supervisor Project Idea

Supervisor

Prof. Davide Sartini

CV

Education

November 2003: Master's Degree in Biological Sciences, Polytechnic University of Marche (UNIVPM).
February 2007: PhD in Urological Oncology, UNIVPM.

Positions

November 2003 - October 2006: PhD Student, UNIVPM.
September 2007 - December 2018: Post-Doc Fellow, UNIVPM and New York University.
December 2018 - December 2021: Assistant Professor in Biochemistry, UNIVPM.
December 2021 - today: Associate Professor in Biochemistry, UNIVPM.

Research activity

2006 - today: Nicotinamide N-methyltransferase (NNMT) as tumor biomarker: potential for diagnosis, prognosis and therapy.
2011 - today: Structural and kinetic characterization of NNMT: cloning expression and purification of human recombinant enzyme.
2017 - today: Role of paraoxonase-2 in solid tumors.

PUBLICATIONS

Davide Sartini is author of 84 full papers, published in scientific journals with Impact Factor (JCR 2022), as well as indexed in PubMed Central, Scopus and Web of Science repositories.

ORCID LINK

orcid.org/0000-0003-3879-8647

5 MOST SIGNIFICANT/RECENT PUBLICATIONS

1. Peng Y, et al. Biochemistry. 2011 Sep 13;50(36):7800-8.
2. Donato V, et al. Nat Cell Biol. 2017 Apr;19(4):341-351.
3. Gao Y, et al. J Med Chem. 2019 Jul 25;62(14):6597-6614.
4. Campagna R, et al. Pigment Cell Melanoma Res. 2021 Nov;34(6):1039-1048.
5. Campagna R, et al. Int J Mol Sci. 2022 Dec 25;24(1):338.

FOUNDED PROJECTS

Local Unit PI of the project entitled "Role of endogenous retroviruses and nicotinamide N-methyltransferase in radioresistance of head and neck cancers: potential as biomarkers for targeted therapy", funded by the Italian Ministry of University and Research (code 2022S9K3A8) - Bando Prin 2022.

AWARDS

2006: Best poster, 38th National Congress of the Italian Society of Clinical Biochemistry and Molecular Biology (SIBioC).
2007: Best poster, 39th SIBioC National Congress.
2009: AIUC-Di Tora award.
2009: ICGEB Young Investigator Award, Biotecnologia Habana 2009, Medical Application of Biotechnology.
2012: Fondazione Marche/ISSNAF Post-Doc Fellowship.
2016: Fondazione Umberto Veronesi Post-Doc Fellowship.
2017: Fondazione Umberto Veronesi Post-Doc Fellowship.

Research Group Description

REFERENCE DEPARTMENT

Department of Odontostomatologic and Specialized Clinical Sciences (DiSCO) (https://www.disco.univpm.it/)

RESEARCH GROUP DESCRIPTION

The research group Prof. Sartini belongs to includes members mainly operating in the Laboratory of Enzymology and Clinical Molecular Biology (Head Prof. Monica Emanuelli). The Lab (https://www.disco.univpm.it/content/bio10-emanuelli-monica) is equipped with Real Time System CFX96 (Bio-Rad), ChemiDoc XRS+ (Bio-Rad) and High Performance Liquid Chromatography System 10 DVP-UV-Vis photodiode array detector (Shimadzu).
Experimental activity is mainly focused on the following research fields.

- Identification of tumor biomarkers for diagnosis, prognosis and therapy.
- Evaluation of the role played by NNMT and PON2 enzymes in neoplasms, aimed to unveil the contribution of these molecules in cancer cell metabolism and phenotype.
- Cloning, expression and purification of human recombinant proteins.

Since 2014, Prof. Sartini actively collaborates with Prof. Nathaniel Martin (https://www.universiteitleiden.nl/en/staffmembers/nathaniel-martin#tab-1) and Dr. Matthijs Van Haren (https://www.universiteitleiden.nl/en/staffmembers/matthijs-van-haren#tab-1), Leiden University, Leiden (The Netherlands) and with Prof. Richard Parsons (https://www.kcl.ac.uk/people/richard-parsons), King's College London (UK), concerning studies aimed to identify alternate substrates of NNMT, as well as to design, synthesize and assay specific enzyme inhibitors. Davide Sartini is among the inventors of the patent n°. 2027866, granted by the Netherlands Patent Office, entitled "Inhibitors of Nicotinamide N-methyl Transferase (NNMT)".
In 2023, Prof. Sartini started to collaborate with Prof. Rubén Martínez Buey (https://produccioncientifica.usal.es/investigadores/57552/detalle), University of Salamanca (Spain), concerning studies focused on obtaining human recombinant NNMT crystals suitable for further X-ray diffraction crystallography.

Group Members

Prof. Monica Emanuelli (Head), Full Professor
Prof. Eleonora Salvolini, Associate Professor
Prof. Davide Sartini, Associate Professor
Dr. Valentina Pozzi, Assistant Professor

Dr. Roberto Campagna, Assistant Professor
Dr. Veronica Pompei, Postdoc Fellow
Dr. Emma Nicol Serritelli, PhD Student
Dr. Valentina Schiavoni, PhD Student
Dr. Eleonora Gerini, PhD Student

Title and goals

PROJECT TITLE
Nicotinamide N-methyltransferase enzyme as molecular target for effective anticancer therapies.

PROJECT IDEA AND GOALS
The first part of the experimental work will be focused on cloning, expression and purification of human recombinant NNMT enzyme, by using a eukaryotic expression system. This approach would provide good yields, in terms of protein expression, as well as guarantee the presence of post-translational modifications relevant to NNMT activity, which otherwise would be lost when expressing in *E. coli*.
During the subsequent phase of the experimental plan, catalytic assays will be carried out to evaluate the effect induced by small molecules on NNMT activity, in order to identify compounds that could act as efficient enzyme inhibitors. Further in vitro cell-based assays will explore the ability of these compounds to affect tumor cell phenotypic traits, such as proliferation, migration and chemosensitivity.
The final step of the project will be devoted to the obtention of crystals, related to purified NNMT in combination with efficient inhibitors, suitable for X-ray crystallography experiments. This will elucidate the high-resolution structure of different protein-ligand complexes, thus allowing to unveil the inhibitory mechanism-of-action.

Contact details

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