



Sandra Marmioli

Professor of Histology and Embryology

Department of Biomedical, Metabolic and Neural Sciences, Section of Morphology

University of Modena and Reggio Emilia

via del Pozzo 71

41125 Modena-Italy

Tel: +39.059.422.4833/5656

sandra.marmioli@unimore.it

Sandra Marmioli runs the Cellular Signaling Unit, Section of Morphology, Department of Biomedical, Metabolic and Neural Sciences.



Lab members: Ludovica Antolini (PhD student); Manuela Zavatti, PhD (researcher and Lab Manager); Valentina Serafin, PhD (Assistant Professor)



Former lab members

Laura Anselmi, post-doctoral fellow, Luca Braglia, PhD student, Sali Darici, PhD student

Core competencies of the Cellular Signaling Unit

- Analysis of proteins and phosphoproteins; in silico as well as in vitro identification of consensus sequences and phosphorylation sites of the ABC family of protein kinases
- Evaluation of cell energy metabolism through lactate, extracellular acidification and oxygen consumption rates
- Quantification of the migration and/or invasion ability of normal and cancer cell
- Evaluation of the cytotoxicity of second generation PI3K/mTOR inhibitors in stromal/leukemia cells co-cultures, both in normoxia and in hypoxia
- Identification of isoform-specific substrates of the AKT kinases
- Availability of an AML PDX biobank

Main Research Topics

- dissection of the mechanisms by which cell signaling impacts cancer cell survival through adaptation and feedback circuits ultimately leading to resistance to therapy, with particular

emphasis on the PI3K/mTOR kinases, downstream targets and upstream PTEN/PHLPPs regulators

-identification of metabolic vulnerabilities downstream of oncogenic signaling, that fuels tumorigenesis and may represent budding therapeutic targets.

On-going projects

-CAPTURE-Capivasertib and Prostate Cancer Targeting: Unraveling Resistance Elements

-Targeting PI3K/mTOR Signaling in Combination Leukemia Therapy

-Phosphoproteomic Analysis Combined to Metabolic and Mutational Phenotyping to Provide a Novel Stratification and Therapeutical Approach for T-ALL Patients

-Targeting Metabolic Vulnerabilities and Aberrant Signal Transduction Pathways in Pediatric NOTCH1 Wild-Type T-Cell Acute Lymphoblastic Leukemia

On-going and past collaborations

The laboratory of Sandra Marmiroli collaborates with the following Italian and international institutions:

§University of Padova:

-Prof Maria Ruzzene, <http://www.biomed.unipd.it/people/ruzzene-maria/>; Collaboration on:

-mass spectrometry-based quantitative proteomics and MS-based analytical methods to evaluate protein phosphorylation

-purification of protein and antibody production

-protein phosphorylation and structural and functional characterization of protein kinases and phosphatases.

§University of Glasgow, UK.

-Dr Xu Huang, Paul O'Gorman Leukaemia Research Centre, Gartnavel General Hospital, Glasgow, UK.

<http://www.gla.ac.uk/researchinstitutes/cancersciences/research/units/paulogormanleukaemia-researchcentre/xhuang>

The Huang laboratory provides general shared resources and a strongly leukaemia, epigenetic and stem cell focused research environment. Sandra Marmiroli and Xu Huang have recently established a very fruitful collaboration. The post-doctoral fellow Laura Anselmi and the

graduate student Sali Darichi from the laboratory of Sandra Marmiroli have been and still are visiting fellows in the Huang laboratory. Sharing/exchanging of scientific ideas and non-commercial reagents between the two laboratories is successfully going on through an official agreement of reciprocal collaboration since 2017 (agreement N. 1494/ 13 10 2017; REP 972017).

Collaboration on: Phosphoproteomic Analysis Combined to Metabolic and Mutational Phenotyping to Provide a Novel Stratification and Therapeutical Approach for T-ALL Patients. The collaboration aims to dissect the molecular mechanisms driving metabolic reprogramming and resistance in individual leukemia patients.

§George Mason University, Manassas, VA, USA

-Prof EF Petricoin and LA Liotta, <http://capmm.gmu.edu/capmm-team>

co-directors of the Center for Applied Proteomics and Molecular Medicine, GMU. Jessika Bertacchini, a former postdoc of the Marmiroli laboratory, joined their Center in 2008 to be trained in RPPA technique, and the collaboration is still going on for technical and scientific exchanges.

§Beth Israel Deaconess Medical Centre/Harvard Medical School, Boston, MA, USA.

-Prof Alex Toker, <http://www.tokerlab.com/>

Prof Toker is chief of the Division of Signal Transduction and vice-director of the Cancer Center. Sandra Marmiroli has been visiting scientist in the Toker lab several times, and sharing/exchanging scientific ideas and non-commercial reagents with the Toker laboratory is successfully going on through an agreement of reciprocal collaboration since 2008 (agreement prot. N. 154/2008), when Sandra Marmiroli was the recipient of a "FIRB Internazionalizzazione Italia-USA" research grant. Since then, three graduate students and two post-doctoral scientists from the laboratory of Sandra Marmiroli joined the Toker lab.

Professional experience

- **Full Professor BIOS-13/A (BIO/17) Histology and Embryology**, University of Modena and Reggio Emilia, Italy, 2020-present;
- **Associate Professor BIO/17-Histology**, University of Modena and Reggio Emilia, Italy, 2002-2020;

- **Visiting Scientist** (supported by CNR-STM program), Beth Israel Deaconess Medical Center, Department of Pathology, Boston. Head Prof. Alex Toker, 2008;
- **Staff Scientist**, Istituto di Citomorfologia Normale e Patologica del CNR, Bologna, December 1998-November 2002;
- **Research Associate**, Istituto di Citomorfologia Normale e Patologica del CNR, Bologna, 1989-1998;
- **Visiting Scientist**, Division of Signal Transduction, Department of Medicine, Harvard Medical School, Boston, Head Dr. L.C. Cantley, 1995;
- **Post-doctoral Fellow**, Laboratory of Cell Biology, Glaxo Institute for Molecular Biology, Geneve, CH, Head Dr. G. Mazzei, 1989;
- **Fellow Scholar**, Department of Molecular Biology, Weizmann Institute/Hadassah Medical School, Hebrew University, Israel, Head Dr. Uriel Bachrach, 1985.
- Member of the committee of the **University of Barcelona** for the selection of international candidates for the position of Associate Professors and Tenure-eligible Lecturers, 2019-present
- Author of 90 original articles/reviews, H-index 33 (Scopus)

Editorial activity/editorial board membership.

- Editorial Board member of Kinases and Phosphatases (2022-)
- Editorial Board member of Biochemistry and Cell Biology (2016-)
- Editorial Board member of International Journal of Molecular Sciences (2018-)
- Editorial Board member of Biomedicines (2020-)
- Lead Guest Editor “Phosphorylation, signaling and disease: targets and targeting”, Biomed Res Int (2014)
- Ad hoc reviewer for several Journals listed by Publons



Left: Sandra with former lab members Laura Anselmi, Sali Darici and Luca Braglia



Sandra with former lab member Laura Anselmi on her thesis defense day



Past and present lab members