

SARA PERUZZI

ABOUT ME

I am a Postdoctoral Fellow with a Master's Degree in Molecular Biology and a Ph.D. in Translational Medicine. I have extensive experience in Biochemistry since, during my career, I mainly worked on projects involving protein characterization both from a functional and structural point of view. I also have a deep knowledge of the major Molecular Biology techniques, including molecular cloning and mutagenesis, as well as large expertise in Cellular Biology. I held my Ph.D. at Scuola Superiore Sant'Anna in Pisa, where I worked in the drug discovery field. The project focused on target validation for a rare neurological disease called Paroxysmal non-kinesigenic dyskinesia. Working in the crystallography field, I acquired strong expertise in recombinant protein expression and purification. I also used highly accurate biophysical methodologies, such as X-ray crystallography and single particle cryo-electron microscopy for the structural characterization of PNKD protein, to obtain insights into its specific function and identify therapeutic targets for the design of small-molecule PNKD modulators. During my post-doc, I moved to the hematology field and I have been working on NPM1-mutated acute myeloid leukemia. My main aim is the study of NPM1 interactome using biotin-based enzyme-catalyzed proximity labeling, to find specific therapeutic targets for this common AML subtype.

DOCTORATE AND PROJECT EXPERIENCE

Mar 2023 - present

Postdoctoral Fellow

Centro di Ricerca Emato-Oncologica (CREO), Department of Medicine and Surgery, University of Perugia, Piazzale G. Menghini 8/9, 06129 Perugia, Italy

- Understanding the mechanisms promoting hox expression in npm1-mutated acute myeloid leukemia– AIRC founded project

Dec 2020 – Mar 2023

Postdoctoral Fellow

Centro di Ricerca Emato-Oncologica (CREO), Department of Medicine and Surgery, University of Perugia, Piazzale G. Menghini 8/9, 06129 Perugia, Italy

- Targeting novel oncogenic dependencies in Acute Myeloid Leukemia with mutated NPM1 – FARE founded project

Mar 2019 – Mar 2020

Postdoctoral Fellow

Laboratory of Pharmacology, Department of Medicine and Surgery, University of Perugia, Piazzale Gambuli 1, 06132 Perugia, Italy

- Structural and functional characterization of IDO2 protein – PRIN founded project

Nov 2014 – Jul 2018

Ph.D. in Translational Medicine

Crystallography Lab, Institute of Life Sciences, Scuola Superiore Sant'Anna, Piazza Martiri della Libertà 33, 56127 Pisa, Italy

- Structural insight into PNKD function – IIT (Italian Institute of Technology) founded Fellowship

UNIVERSITY EDUCATION

Sep 2011 – May 2014

M.Sc. in Applied Biomolecular Sciences, (LM-06, 110 cum Laude), University of Perugia

Thesis

“Expression profile of microRNAs in the neural stem cell niche (SVZ) of GM2-gangliosidosis mouse models”

Sep 2007 – May 2011

B.Sc. in Biology (L-12, 110 cum laude), University of Perugia

Thesis

“Tyrosinase activity inhibition by sunscreens: possible implications in the melanomas incidence increasing”

PERSONAL SKILLS

Research Techniques

- **BIOCHEMISTRY:** heterologous expression of recombinant and fusion proteins in bacteria and eukaryotic cells, protein purification with different chromatographic techniques (affinity chromatography, ion exchange, size exclusion) both in batch and by FPLC (Akta purifier). Protein crystallization, X-ray crystallography, and single-particle cryo-electron microscopy. Validation of protein interaction by immunoprecipitation, co-immunoprecipitation, and enzyme-catalyzed proximity labeling based on biotinylation (TurboID). SDS page, Western Blotting, development of enzymatic assays.
- **MOLECULAR BIOLOGY:** DNA and RNA extraction and purification, primer design, PCR, qPCR, molecular cloning, site-directed mutagenesis. Evaluation of gene expression, shRNA knock-down, CRISPR Cas9 KO.
- **CELL BIOLOGY:** cultivation and manipulation of immortalized, primary and cancer cell lines, ex-vivo cells subtypes purification and cell transfection, viral and non-viral gene delivery techniques, retrovirus and lentivirus production using 293T and FT cell lines, isolation of cells from tissues, cell separation using MACS® MicroBeads.
- **IMMUNOFLUORESCENCE:** cell preparation, fixation, and staining
- **MICROSCOPY:** light and fluorescence microscopy, Confocal Laser Scanning Microscopy
- **MICROBIOLOGY:** production of chemically competent *E. coli* and their transformation, antibiotics selection, small-scale and large-scale bacteria culture
- **STATISTICS:** Basic level in biostatistics

Communication skills

I gained excellent communicational and relational skills thanks to my experience in international teams during the Ph.D. course at IIT in Genoa and the NEST lab in Pisa as well as during my postdoc at CREO lab in Perugia. I'm able to analyze and present the research results to a technical audience, during lab meetings or conferences. I also have experience in science dissemination since I do not only collaborate with the European Researchers' Night (Sharper) at Scuola Superiore Sant'Anna (2016-2017) but was also involved in a series of scientific presentations (Ape-research) for a non-technical audience (2016).

Language(s)

Italian: native speaker

English: Understanding C1, Speaking B1, Writing B2

Computer skills

Good command of Microsoft Office suite and data analysis programs (Origin and GraphPad Prism).

Driving Licence

B

APPENDIX - SCIENTIFIC PROFILE

PUBLICATIONS

- Pianigiani G, Gagliardi A, Mezzasoma F, Rocchio F, Tini V, Bigerna B, Sportoletti P, Caruso S, Marra S, **Peruzzi S**, Petito E, Spinozzi G, Shacham S, Landesman Y, Quintarelli C, Gresele P, Locatelli F, Martelli MP, Falini B, Brunetti L. Prolonged XPO1 inhibition is essential for optimal antileukemic activity in NPM1-mutated AML. *Blood Adv.* 2022 doi: 10.1182/bloodadvances.2022007563.
- Pianigiani G, Rocchio F, **Peruzzi S**, Andresen V, Bigerna B, Sorcini D, Capurro M, Gjertsen BT, Sportoletti P, Di Ianni M, Martelli MP, Brunetti L, Falini B. The absent/low expression of CD34 in NPM1-mutated AML is not related to cytoplasmic dislocation of NPM1 mutant protein. *Leukemia.* 2022. Doi: 10.1038/s41375-022-01593-2.
- Margheritis E, Castellani B, Magotti P, **Peruzzi S**, Romeo E, Natali F, Mostarda S, Gioiello A, Piomelli D, Garau G. Bile acid recognition by human NAPE-PLD. *ACS Chem Biol.* 2016. Doi: 11(10):2908-2914.
- Morpurgo G, Catacuzzeno L, **Peruzzi S**, Blasi P, Fioretti B. Are tyrosinase inhibitors in sunscreens and cosmetics enhancing UV carcinogenicity? *Exp Dermatol.* 2015. Doi: 24(7):546-7.

COMMUNICATIONS

- **Peruzzi S**, Pianigiani G, Betti C, Brunetti L, Falini B.
Oral communication: Targeting novel oncogenic dependencies in NPM1-mutated acute myeloid leukemia. 4th SOHO Italy congress 23-26/10 Roma
- **Peruzzi S**, Pianigiani G, Betti C, Brunetti L, Falini B.
Poster title: Targeting novel oncogenic dependencies in NPM1-mutated acute myeloid leukemia (2022) Spetses Summer school-Cancer Epigenetics- principles, applications and single-cell resolution 28/08-03/09
- Pianigiani G, Rocchio F, **Peruzzi S**, Andresen V, Martelli M.P, Brunetti L, Falini B.
Poster title: L'assente/bassa espressione di cd34 nella LAM NPM11-mutata non è correlata alla localizzazione citoplasmatica del mutante NPM1.
(2022) XVII congresso SIES 31-03/01-04 Roma
- Margheritis E, **Peruzzi S**, Natali F, De Lorenzi V, Magotti P, Garau G.
Poster title: Lipid amide signaling in metabolic and neurological disorders.
(2018) ESRF Meeting UDM3 (Grenoble, FR) – Understanding neurological diseases. 73.
- Margheritis E, Natali F, Marotta R, **Peruzzi S**, Magotti P, Garau G.
Poster title: Bile acid recognition by human NAPE-PLD.
(2017) XLVI AIC Meeting 26-29/06 Perugia
- Margheritis E, Natali F, Marotta R, **Peruzzi S**, Magotti P, Garau G.
Poster title: NAPE-PLD: interactions at the membrane interface.
(2016) EMBO practical course: Biomolecular interaction analysis: from molecules to cells. Porto, PT 06-12/11.

CONGRESSES AND WORKSHOP

1. Workshop Bioimaging: from multiphoton excitation microscopy to optical nanoscopy and biophotonics their applications (Palazzo della Borsa, Genova 14 October 2015)
2. Workshop: Advances on CLEM& 3D electron microscopy for life science (IIT Genova 21 July 2015)
3. Workshop: E.M.S.D: European Multidisciplinary Scientific Day. (Dip. Chimica e Chimica Industriale, Pisa)
4. Workshop: Hands-on single-particle Cryo-EM. CNI@NEST, Pisa, 7-8 May 2018.
5. XVI SIES congress. Milano, 24-27/10/2022
6. Spetses summer school: Cancer epigenetics - principles, applications and single-cell resolution. Spetses 28/08-04/09-2022

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