



Giacomo Corucci

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Scientific interests

- Structural biology;
- Vector design, cloning and cell culture;
- Protein expression and purification;
- Biochemical/biophysical assays and characterization;
- Protein-lipid interaction studies;
- X-ray and neutron scattering.

Keywords

Cloning Bacteria Cell Culture
Insect cells baculovirus
Protein Expression and Purification
Lipid Synthesis and Purification
Natural Lipids SDS-PAGE WB
Protein aggregation studies
Chromatography (IMAC, IEX, SEC)
FPLC HPLC TLC UV-VIS
Protein/Lipid Mass Spectrometry CD
ITC SAS Xray/Neutrons
Neutron Reflectivity DLS Ellipsometry
Langmuir Through QCM-D BAM
Python Fortran f90

Background

Structural biology has always fascinated me, ever since I heard about it. I like the idea behind this field, where physics, chemistry and biology mix together to solve big and complicated puzzles that nature offers us. In my five years of experience in the lab, I have been mainly focused on protein-lipid interactions through employing various chemical/physical techniques. I graduated in molecular biology from UNIVPM university of Ancona with a thesis on molecular biophysics (Expression and purification of a snake venom peptide (Crotamine) and analysis of its interaction with model lipid membranes). I moved on doing a PhD at Institut Laue Langevin in biophysics, studying the kinetics of a phospholipase and its interaction with lipid membranes. Currently I am doing a postdoc in Imperial College London on protein aggregation related to neurodegenerative diseases, such as Alzheimer's and FTD diseases. During this time I had the opportunity to be involved also in other projects ranging from lipid nanoparticles SAXS structural analysis, extraction from biomass and characterization of phospholipids using mass spectrometry and SAS/reflectometry, to the interaction of different metabolites with model membranes (like caffeine, curcuminoids) and peptide/membrane interaction. Among this projects, the need to develop an in house software for the data fitting arose, since the programs available on-line sometime are tricky to adapt to the model under analysis. From this need, CoruxFit was born, a python based program for neutron and X-ray reflectivity data analysis.

Current situation

Feb. 2023 – Till date **Post-Doctoral Studies at Imperial College London**

Expression and purification of different TDP43 variants, and its aggregated structural analysis using lab technique as well as SAXS.

Data analysis

Python ●●●●○
Gnuplot ●●●●○
Fortran f90 ●●●●○
C++ ●●○○○
Genfit for SAS ●●●●○
Mass Hunter ●●○○○

Languages

Italian Mother language
English ●●●○○
French ●○○○○

Experience

Nov. 2019 – Feb 2023 **Doctoral Studies at Institut Laue Langevin, Grenoble (France)**

Oct. 2017 – Oct 2019 **Master Thesis and Intership at MASBIC (Marche Structural Biology Center) and Molecular Biophysics group at UNIVPM, Ancona (Italy)**

Mar. 2018 – Apr. 2018. **Intership at Crystallography Intitute CNR, Trieste (Italy)**

Jun. 2016 – Jul. 2016. **Intership at "Ospedali Riuniti Marche Nord" Hospital, Pesaro (Italy)**

List of Publications

Please check my Google Scholar webpage at [Giacomo-Corucci-google-scholar](#)

Trainings

5-10 Dec. 2021 **Biophysical workshop in Bordeaux**

Biophysical techniques workshop: NMR, FT-IR, Xray crystallography, Mass Spectrometry, Cryo-EM and EM.

27-31 Jan. 2020 **XXIV International School of Pure and Applied Biophysics**

Neutron and Xray scattering techniques.

14-24 Sep. 2018 **"Giornate Didattiche" for neutron and Xray science.**

Theory of the scattering and overview of the instruments.

Others **ECDL certification, Core Level**

Conferences

14-16 Sep. 2022 **SISN conference Milano, Italy** Oral presentation

13-15 Jun. 2022 **Bilayer at ESS, Lund** Poster presentation

8-10 Sep. 2021 **GEM Conference 2021** Poster presentation

24-28 Jul. 2021 **13th European Biophysics Conference (EBSA)** Poster presentation

7-9 Apr. 2021 **7th European Joint Theoretical/Experimental Meeting on Membranes** Poster presentation

11-13 Sep. 2019 **BILL 2019, Bilayers at ILL** Poster presentation

10-13 Sep. 2018 **Societa' Italiana Biofisica Pura e Applicata (SIBPA)** Poster presentation

Proposals submitted

Over the past 5 years, I have been submitted and obtained around 5 proposal to perform neutron and Xray scattering measurements at Institut Laue Langevin and European Synchrotrone Radiation Facility, equivalent to over 500,000 pounds.

Publications

- Structural characterization of natural yeast phosphatidylcholine and bacterial phosphatidylglycerol lipid multilayers by neutron diffraction** - Alessandra Luchini, [Giacomo Corucci](#), Krishna Chaithanya Batchu, [...] doi: [/fchem.2021.628186](#)
- Lipid bilayer degradation induced by SARS-CoV-2 spike protein as revealed by neutron reflectometry** - Alessandra Luchini, Samantha Micciulla, [Giacomo Corucci](#), Krishna Chaithanya Batchu, [...] doi: [/s41598-021-93996-x](#)
- Interaction of Caffeine with Model Lipid Membranes** - Letizia Tavagnacco, [Giacomo Corucci](#), Yuri Gerelli. doi: [/acs.jpcc.1c04360](#)
- Strikingly different roles of SARS-CoV-2 fusion peptides uncovered by neutron scattering** - Andreas Santamaria, Krishna C Batchu, Olga Matsarskaia, Sylvain F Prévost, Daniela Russo, Francesca Natali, Tilo Seydel, Ingo Hoffmann, Valérie Laux, Michael Haertlein, Tamim A Darwish, Robert A Russell, [Giacomo Corucci](#), Giovanna Fragneto, Armando Maestro, Nathan R Zaccai. *Jacs Am. Chem. Soc.*, 14 February 2022 doi: [/jacs.1c09856](#)
- Dark peptide discs for the investigation of membrane proteins in supported lipid bilayers: the case of synaptobrevin 2 (VAMP2)** - Alessandra Luchini, Frederik Grønbech Tidemand, Nicolai Tidemand Johansen, Federica Sebastiani, [Giacomo Corucci](#) [...]doi: [/D2NA00384H](#)
- Developing Advanced Models of Biological Membranes with Hydrogenous and Deuterated Natural Glycerophospholipid Mixtures.** - [Giacomo Corucci*](#), Krishna Chaithanya Batchu*, Alessandra Luchini [...]doi: [/j.jcis.2023.04.135](#)
- Assessing the role of histidines in the histidine-rich antimicrobial and antifungal saliva peptide Histatin 5 upon interaction with solid surfaces and lipid bilayers** - Amanda E. Skog, [Giacomo Corucci](#), Mark D. Tully, Giovanna Fragneto, Yuri Gerelli, and Marie Skepo *Langmuir* 2023 doi: [/acs.langmuir.3c00498](#)
- Small-angle scattering from flat bilayers containing correlated scattering length density inhomogeneities** - F. Spinozzi, L. R. S. Barbosa, [G. Corucci](#), P. Mariani and R. Itri *Journal of Applied Crystallography* 2023 doi: [/S1600576723006143](#)
- Small-angle X-ray scattering unveils the internal structure of lipid nanoparticles** - Francesco Spinozzi, Paolo Moretti, Diego Romano Perinelli, [Giacomo Corucci](#), [...]doi: [/j.jcis.2024.02.076](#)
- Creating and characterizing bacterial membrane mimetics from hydrogenous and deuterated *Escherichia coli* polar mixtures** - [Giacomo Corucci](#), Pablo Sanchez, Alice Piccinini, Krishna Batchu, Valerie Laux, Javier Carrascosa, Andreas Santamaria, Samantha Micciulla, Alessandra Luchini, Giovanna Fragneto *Paper under preparation*
- Analysis of the Factors Regulating the Activity of the PLA1-1 isoform: A Neutron Reflectivity and Mass-Spectrometric study** - [Giacomo Corucci](#), Krishna Batchu, Valerie Laux, [...] *Paper under preparation*
- Crotamine - lipid membranes SAXS interaction studies** - [Giacomo Corucci](#), Enrico Baldassarri, Francesco Spinozzi, Rosangela Itri, [...] *Paper under preparation*