Matteo DE MARCO

EDUCATION

MSc in Molecular Biology | 2019-2021
University of Pavia, Italy
-Student at *Armenise-Harvard lab* – University of Pavia, Italy http://fornerislab.unipv.it
-Involved in the research work of Luigi Scietti-PhD, focused in the structural and functional characterization of collagen remodelling enzymes.
-Graduated with 101/110

BSc in Biology | 2016-2019
University of Pavia, Italy
-Internship, of 6 months, carried out at" Istituto di Neuroscienze CNR, Milan" http://www.in.cnr.it
-Theses on "Expression and trafficking of nicotinic receptors of the α3β4 type", supervisor Dr. Sara F.Colombo.
-Graduated with 101/110

EXPERIENCE

-Current research on "Study of photosynthesis for the sustainable production of food, energy and climate improvement", under the supervision of Prof.Alberta Pinnola (BioPhotoLab, Uipv)
-Research on "Molecular Characterization of collagen biosynthesis enzymes", research fellowship supported by AIRC, under the supervision of Prof. Federico Forneris (Armenise-Harvard laboratories, University of Pavia)|2021-2022.

PUBBLICATIONS

-In preparation: "Crystal structure of the full-length human collagen galactosyltransferase GLT25D1"; De Marco Matteo, Luigi Scietti.
-Pubblished: "A Fe2+-dependent self-inhibited state influences the druggability of human collagen lysyl hydroxylase (LH/PLOD) enzymes"; Luigi Scietti,Elisabetta Moroni,Daiana Mattoteia,Marco Fumagalli,Matteo De Marco,Lisa Negro,Antonella Chiapparino,Stefano Artin Serapian,Francesca De Giorgi,Silvia Faravelli,Giorgio Colombo and Federico Forneris,https://doi.org/10.3389/fmolb.2022.876352
-In preparation:" A cooperative network of molecular "hot spots" highlights the complexity of LH3 collagen glycosyltransferase activities"; Antonella Chiapparino, Francesca De Giorgia, Luigi Sciettia, Matteo De Marco, Silvia Faravellia, Marco Fumagalli, Tony Roscioli, Federico Forneris.

CORE TECHNICAL SKILLS

Cellular biology

-Growth and maintenance of human cell culture, HeLa and HEK293 cells
-Transfection with Jet-PEI techniques of HeLa cells

Protein production, purification, and characterization

- Set-up of protein expression methods in E. *coli* and HEK293 cell lines (basics)
- Development of protein purification strategies (affinity, ionic and seize exclusion chromatography) in batch and using AKTA and NGC systems
- Enzymatic assay, Succi-Glo assay (Glomax)

Biophysics

- Protein stability characterization using DSF (Nanotemper Tyco) and DSC
- Characterization of protein-protein, protein-peptides and protein-small molecules interactions using MST (Monolith)

Crystallography

- Protein crystallization using vapour diffusion and batch, hanging, and sitting drop, manual; soaking procedures with heavy atoms and small molecules; SeMET growth and purification pipelines
- X-ray data collection data acquisitions on synchrotrons beamlines (ESRF, SLS, Diamond).

- X-ray data processing, structure solution (molecular replacement and experimental phasing) and refinement using XDS, ccp4i, coot and online software.

Electron Microscopy

- Negative staining EM sample preparation and acquisition for single particle workflow, and images processing.

Molecular biology

- PCR, cloning, mutagenesis, DNA extraction and manipulation transformation of E. coli cells.
- Electrophoretic techniques: agarose electrophoresis, SDS-PAGE, and Western blotting.

Informatics skills

- Good knowledge of windows operating system and Linux system (Debian and derivatives).
-3D graphics software for protein structure visualization and modelling: PyMOL, ChimeraX, Coot.
-Basic knowledge of Python, HTML and Java program languages.

CONGRES AND WORKSHOPS

-Instruct-iNEXT Course: Integrating Structural Biology Techniques (Oeiras,Portugal), 25/09/2022-01/10/2022.
-Fluorescence microscopy congres by CGS (Università degli Studi di Pavia), 11/11/2021-15/12/2021
-XLIX Meeting of the Italian Association of Crystallography, 6-9 September 2021, Parma
-Nanotemper Monolith training 22/06/2021
-Analytical Techniques for Structural Characterization of Glycosaminoglycans (University of Georgia), 23/08/2021-24/08/2021.

REFERENCES

Prof. Federico Forneris
(University of Pavia,MSc Supervisor)
federico.forneris@unipv.it
Dr. Luigi Scietti
(Head of the Biochemistry and Structural Biology Unit @ European Institute of Oncology (IEO), MSc Supervisor)

PhD Project:

“Study of photosynthesis for the sustainable production of food, energy and climate improvement.”

Supervisor: Prof. Alberta Pinnola.

Reviewer: Prof.Claudia Binda.

External Reviewer: Prof. Federico Forneris.