

# Matteo DE MARCO

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## 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  $\alpha 3\beta 4$  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.

## PUBLICATIONS

-In preparation: "Crystal structure of the full-length human collagen galactosyltransferase GLT25D1"; De Marco Matteo, Luigi Scietti.

-Published: "A Fe<sup>2+</sup>-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 size exclusion chromatography) in batch and using AKTA and NGC systems

- Enzymatic assay, Succinyl-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)

[LuigiAngelo.Scietti@ieo.it](mailto:LuigiAngelo.Scietti@ieo.it)

*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.*

