CURRICULUM VITAE of MATTEO RE

NAME: Matteo Re

POSITION TITLE: PhD Student in Science and Technology of Advanced Therapies (STAT)

EDUCATION/TRAINING:

INSTITUTION AND LOCATION	DEGREE	Start	Completion	FIELD OF STUDY	GRADE
IIS B. Cellini, Valenza (AL)	High School Diploma	2015	2020	Scientific track	100/100 *cum laude*
University of Pavia, Pavia	BSc	10/2020	07/2023	Biotechnology	110/110 *cum laude*
University of Pavia, Pavia	MSc	10/2023	07/2025	Molecular Biology and Genetics	110/110 *cum laude*

Personal Statement

My scientific journey has always been characterized by a growing curiosity for the understanding of fundamental mechanisms that govern life. Initially, my research interest was oriented towards genomic studies, through which I gained valuable knowledge into gene expression and regulation. However, over time, I shifted my attention to a more proteomic and structural biology perspective, which I discovered to be my true passion.

I am deeply fascinated by the challenge of understanding how enzymes can coordinate their activity among all the complex cellular processes. This integrative approach motivates me to pursue advanced studies that combine molecular mechanisms with structural insights, aiming to contribute to a clearer understanding of cellular function.

Through my previous experiences, I gained a wide range of molecular skills, spanning from biochemical protein characterization and genomic analysis to cellular and structural studies. The variety of my training has made me used to work across different disciplines and it has taught me how to integrate different approaches to assess complex problems. Taken together, all these skills make me particularly suited for a multidisciplinary PhD program like this one.

Positions and Previous experiences

From – to	**Description**
2025 - ongoing	**PhD Student:** Science and Technology of Advanced Therapies - Scuola Universitaria Superiore IUSS Pavia Supervisor: Prof. Andrea Mattevi - Structural Biology Lab
2023 - 2025	**MSc Internship:** Structural Biology Lab - PI: Andrea Mattevi Thesis title: 'Uncovering the NADPH Oxidase 2–CpsA interaction: a key immune evasion strategy by Mycobacterium tuberculosis'
2022 - 2023	**BSc Internship:** Molecular and Cellular Biology Lab - PI: Elena Giulotto Thesis title: 'Analysis of the expression profile of subtelomeric loci in human cell lines'

Contributions to Science

1. **Undergraduate Research:** as part of my bachelor's thesis in Biotechnology, I investigated the expression profile of subtelomeric loci in human cell lines. The project aimed to explore the transcriptional activity of regions near telomeres, which are often epigenetically regulated and may contribute to genome stability and aging. I focused on primer design, DNA/RNA extraction and quantitative PCR analysis to assess the expression levels of selected subtelomeric genes. Through this work, I gained hands-on experience in the experimental analysis of gene expression and I was introduced to fundamental molecular biology methodologies.
2. **Graduate Research**: my master's thesis focused on the biochemical and structural characterization of the mycobacterial protein CpsA and its interaction with human NOX2. This work aimed at elucidating a novel immune evasion mechanism of *M. tuberculosis* and contributed to a better understanding of NOX2 regulation. I was actively involved in the recombinant expression and purification of protein complexes, protein-protein interaction studies, site-directed mutagenesis and the design and execution of ROS assays to evaluate functional activity. Additionally, I contributed to structural investigations, including the initial preparation of high-quality samples for cryo-electron microscopy (Cryo-EM) analysis.

Skills and Expertise (Technical and Linguistic Competencies)

1. **Laboratory and Experimental Techniques:**
   - Molecular Biology: recombinant protein expression, primer design, molecular cloning, site-directed mutagenesis, DNA and RNA extraction, PCR, quantitative PCR
   - Biochemistry: protein purification (affinity chromatography, size exclusion chromatography) in batch and using AKTA system, protein-protein interaction assays, ROS activity assays, enzymatic assays, inhibition studies
   - Structural Biology: Crystallography, Cryo-EM sample preparation and analysis, negative staining
   - Cell Biology: human cell culture in suspension and adhesion, human cells transfection, *in cellulo* activity assays, *in cellulo* proximity labeling
   - Analytical Techniques: SDS-PAGE, Blue Native-PAGE, Western blotting, spectrophotometry, fluorimetry, mass photometry, HPLC-MS.
2. **Software and IT Tools:**

Microsoft Office Suite	Proficient in document editing, data organization and presentation design
GraphPad Prism	Statistical analysis, graph creation and interpretation of experimental data
ChimeraX	Visualization and interpretation of protein structures and molecular complexes
Bioinformatic tools	Familiarity with biological databases such as UniProt, PDB and NCBI

3. **Languages**:

   English: C1 (Listening, Reading, Writing), B2 (Speaking)

   Italian: Native