

# ALESSANDRO ANTONIO MASI

## Biomedical & Computational Scientist

@alessandroantoniomasi69@gmail.com    Milan, Italy  
alessandro-masi-biologist    0000-0001-5932-7794



## PROFILE

I am a biologist with multidisciplinary experience in **protein biochemistry**, molecular interaction analysis, **mass spectrometry**, and **structural/computational biology**. I have contributed to international projects in immunology, infectious diseases, and glycobiology, integrating experimental approaches (ITC, fluorescence assays, NMR, native MS) with molecular dynamics simulations and advanced data-analysis workflows.

Throughout my research career, I have developed a **hybrid scientific profile** capable of managing end-to-end workflows—from sample preparation to computational modelling. I have contributed to peer-reviewed publications in high-impact journals (Advanced Science, JACS Au) and performed structural analyses on numerous protein–ligand systems using multidisciplinary strategies.

Alongside research activities, I have gained experience in **laboratory management** and **personnel training**, supporting PhD students and master's students in experimental planning, instrumentation usage, and troubleshooting.

I am currently expanding my training in clinical research, with a growing interest in **GCP**, **GMP**, scientific documentation, and **regulatory processes**, as part of a professional path oriented toward Clinical Research Associate (CRA) roles and biotech/pharma/CRO environments.

## RESEARCH EXPERIENCE

### PhD Researcher — Computational & Quantitative Biology

#### University of Naples Federico II

2022 – 2025

Naples, Italy

- Structural and thermodynamic analysis of protein–glycan interactions using MD, ITC, fluorescence assays, NMR, and native MS.
- Development of computational pipelines for MD trajectory analysis, docking, and glycan conformational sampling.
- Integration of experimental and computational datasets to elucidate molecular recognition mechanisms (Siglec-7, gangliosides, bacterial glycans).
- Supervision and support of PhD and MSc students in experimental design and data analysis.

Visiting Researcher — ISPSO Institute

## TECHNICAL SKILLS

### Molecular Biology & Biochemistry

- Extraction and purification of LPS, Lipid A and oligosaccharides.
- Electrophoresis: agarose, SDS-PAGE (Coomassie/silver), Western Blot.
- Bacterial manipulation: transformation, cloning vectors, heterologous expression in *E. coli*.
- Protein/glycan purification: SEC, IMAC, ÄKTA Pure systems.
- Sample preparation for GC-MS, MALDI-ToF and native ESI-MS.
- NMR: COSY, NOESY, ROESY, TOCSY, HSQC, HMBC, HSQC-TOCSY; STD-NMR epitope mapping.
- ITC: sample preparation, experiment execution, thermodynamic interpretation.
- Native ESI-MS (Bruker timsTOF SCP) for affinity and stoichiometry determination.
- Fluorimetric titrations (K<sub>b</sub>, K<sub>d</sub>,  $\Delta H$ ).

### Microbiology

- Use of biosafety hoods, centrifuges, autoclaves, pH meters, lyophilizer, rotavapor.
- Preparation of rich and isotopically labelled media.
- Small and large-scale microbial cultures (aerobic bacteria).
- Optical and phase-contrast microscopy.

### Computational Biochemistry & Modelling

- Linux/Windows environments; command-line workflow.
- Python (Jupyter): NumPy, Pandas, SciPy, Matplotlib, Biopython, MDAnalysis, MDTraj, NGLview.
- Structural prediction: AlphaFold, RosettaFold (Colab/Local).
- Visualization: PyMOL, Chimera, ChimeraX, Discovery Studio, Schrödinger Maestro.
- Molecular docking: AutoDock, Vina, Vina-Carb, HADDOCK, DiffDock.

## Université de Genève – Valerie Gabelica Lab

📅 March 2025 – April 2025

📍 Geneva, Switzerland

- Quantification of association/dissociation kinetics for 21 protein–ligand systems using Bruker timsTOF SCP (ion mobility MS).
- Processing and interpretation of high-resolution ESI-MS datasets using Bruker DataAnalysis and MATLAB.
- Structural interpretation and modelling of binding profiles through IM-MS parameter analysis.

## EDUCATION

PhD in Computational and Quantitative Biology (38th Cycle)

University of Naples Federico II

📅 2022 – 2025

📍 Naples, Italy

- Expected defense: February.
- Supervisor: Prof. Alba Silipo.

MSc in Biology (LM-06), Biomolecular Curriculum – 110/110 cum laude

University of Naples Federico II

📅 2020 – 2022

📍 Naples, Italy

- Thesis: *From hydrothermal vents to human: Comparative genomics and structural characterization of PrtC-like sheds light on the evolution of pathogenesis in Campylobacterota.*
- Supervisor: Prof. Angelina Cordone.

BSc in Biological Sciences (L-13)

University of Naples Federico II

📅 2016 – 2020

📍 Naples, Italy

- Thesis: *Production of an antibody for One cut like gene peptide and Western Blot on Danio rerio tissues.*
- Supervisor: Prof. Francesco Aniello.

## PUBLICATIONS

- Gerpe Amor, T.; Masi, A.A.; Silipo, A. et al. *Molecular Basis of Siglec-7 Recognition by Neisseria meningitidis Serogroup Y CPS: Implications for Immune Evasion.* **JACS Au**, 2025. IF: 8.6. doi:10.1021/jacsau.5c00214
- Di Carluccio, C.; Masi, A.A.; Silipo, A. et al. *The Conformational Features of Fusobacterium nucleatum 10953 LPS O-Antigen Mediate its Interaction with Siglec-7 and Unveil a Novel Binding Epitope.* **JACS Au**, 2025. IF: 8.6. doi:10.1021/jacsau.5c00810
- Di Carluccio, C.; Masi, A.A.; Silipo, A. et al. *Insights into Siglec-7 Binding to Gangliosides: NMR Protein Assignment and the Impact of Ligand Flexibility.* **Advanced Science**, 2025. IF: 14.6. doi:10.1002/advs.202415782

## CONFERENCES & PRESENTATIONS

- MD: AMBER/AmberTools, GROMACS, Desmond; ligand parametrization; trajectory analysis.
- In silico structural analyses (SAVESv6, ConSurf, ExPASy, CAPSIF).

## SOFT SKILLS

- Mentoring and training of PhD and MSc students (experimental workflows and data analysis).
- Operational coordination of laboratory activities and workflow optimization.
- Scientific troubleshooting (instrumentation, assays, computational pipelines).
- Time and priority management across parallel projects.
- Teamwork in multidisciplinary and international environments.
- Clear communication (scientific writing, seminars, meetings, conferences).
- Adaptability and fast learning of new techniques and software tools.
- Ongoing training in GCP, GMP, scientific documentation and regulated environments.

## ADDITIONAL TRAINING & CERTIFICATIONS

- Professional License – Biologist, Section A.
- Advanced laboratory safety course (D.Lgs. 81/2008).
- MDPI Webinar: *Biological Activities and Applications of Phytotoxins* (2023).
- Structural Glycoscience Summer School (ESRF & UGA) – 20h practical/theoretical + poster (2023).
- GIDRM – National School of NMR for Small Molecule Analysis (2024).
- International School on Mass Spectrometry (Erice) – Ion Mobility MS (2024).
- HR-MS School (Univ. Salerno & SCI) – High-resolution MS and IM-MS (2024).

## SCIENTIFIC REFERENCES

- Prof. Alba Silipo – University of Naples Federico II alba.silipo@unina.it
- Prof. Antonio Molinaro – University of Naples Federico II antonio.molinaro@unina.it
- Prof. Angelina Cordone – University of Naples Federico II angelina.cordone@unina.it

- **IMYR23 – Young Researchers Meeting (INNOGLY & GLYCONanoPROBES)**  
Poster + flash oral: *Exploring the Interaction Between Siglec-7 and Disialylated Gangliosides* (2023).
- **EuroCarb21 – International Symposium in Glycosciences**  
Poster: *Unveiling the Interactions Between Siglecs and Sialylated Glycans* (2023).
- **SCI 2024 – Italian Chemical Society Congress**  
Poster: *Structural Complexity of Antibody-Epitope Recognition in Neisseria gonorrhoeae* (2024).
- **CSCC 2025 – Italian Carbohydrate Chemistry School**  
Oral: *Structural Clues to Target Neisseria gonorrhoeae by Deciphering the 2C7 Epitope* (2025).
- **EuroCarb22 – International Symposium in Glycosciences**  
Flash oral + poster: *Molecular Exploitation of Neisseria gonorrhoeae LOS Recognition by the Therapeutic Antibody 2C7* (2025).
- **Prof. Donato Giovannelli – University of Naples Federico II**  
donato.giovannelli@unina.it