Matilde Rossi

Nationality: Italian **Date of birth:** 23/05/1995 **Gender:** Female

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ABOUT ME

During my studies, I gained a strong foundation in the principles of chemistry and developed a particular interest in the study of biomolecules. I had the opportunity to work on several research projects throughout my academic career which brought me closer to the field of medicinal chemistry and peptide chemistry.

EDUCATION AND TRAINING

PhD Student
University of Florence [02/11/2023 – Current]

City: Florence
Country: Italy
Website: https://www.unifi.it
Field(s) of study: Chemistry

Project focused on the development of peptide nucleic acids (PNAs)-based molecules targeting non-canonical nucleic acid structures.

MSc in Chemical Sciences - Curriculum Chemistry of Biomolecules
University of Florence [29/10/2020 – 19/10/2023]

Address: Piazza di San Marco, 4, 50121 Florence (Italy)
Website: https://www.unifi.it
Field(s) of study: Chemistry
Final grade: 110/110 cum laude
Thesis: Development of peptide-based modulators of the CaMKII/Shank3 and Homer3/Shank3 interaction

Master's Thesis
Tutor Prof. Anna Maria Papini, Cotutor: Prof. Kristian Strømgaard, Department for Drug Design and Pharmacology, University of Copenhagen

The project focused on the investigation and development of a peptide-based modulator to modulate the interaction between some of the most abundant proteins in the postsynaptic density region in neurons (PSD). To achieve this objective, high-throughput screening was carried out using SPOT technology, followed by epitope mapping to identify the most promising binding peptides. Solid phase peptide synthesis (SPPS) was used to generate a library of peptides with high binding potential. These peptides were then tested using binding assays to evaluate their efficacy. By employing these techniques, we aimed to identify a peptidic modulator that could effectively modulate the interaction between the target PSD proteins. This could have important therapeutic implications for various neurodegenerative diseases.

Skills covered:

- Solid phase peptide synthesis techniques (manual and automated)
- Peptide compounds purification techniques (HPLC)
- Analysis methodologies (LCMS, UPLC)
- Peptide array display methods (SPOT) related to quality control and binding epitope mapping
- Fluorescence polarization saturation assays
- Pull down assays

Erasmus traineeship
University of Copenhagen [05/09/2022 – 18/03/2023]

Address: Nørregade 10, 1165 København (Denmark)
Website: https://www.ku.dk

In my Erasmus traineeship mobility I had the opportunity to work in the Kristian Strømgaard Lab at the Department of Drug Design and Pharmacology of the University of Copenhagen for my Master's thesis. During this experience, I deepened my understanding of medicinal chemistry, particularly in relation to the role of peptide chemistry in pharmacology; I had the opportunity to learn the fundamentals of drug design in this field combining tools from chemistry and biology.

Bsc in Chemistry - Curriculum Chemical Sciences
University of Florence [29/10/2014 – 23/09/2020]

Address: Piazza San Marco, 4, 50121 Florence (Italy)
Website: https://www.unifi.it
Final grade: 109/110
Thesis: Synthesis of a glucosylceramide mimic potential pharmacological chaperone of the GCase enzyme

Banchelor's Thesis
Tutor: Prof. Francesca Cardona, Department of Chemistry "Ugo Schiff" University of Florence

The project aimed to investigate the synthetic pathways and organic synthesis of an azasugar with a polyhydroxylated piperidine structure, which could have been served as a glucosylceramide mimic and as potential pharmacological chaperone of the GCase enzyme. The successful synthesis of a glucosylceramide mimic may offer significant insights into the development of pharmacological chaperones for GCase enzyme deficiencies, which are known to be associated with a variety of debilitating disorders such as Parkinson's disease and Gaucher's disease.

Skills covered:

• Critical analysis of the activity-related structure of biomolecules
• Development of organic synthetic methodologies
• Synthesis and purification of organic compounds
• Characterization of organic compounds by analytical techniques such as two-dimensional 1H-NMR (gCOSY and gHSQC), 13C-NMR, mass spectroscopy, optical rotatory power, and IR

LANGUAGE SKILLS

Mother tongue(s): **Italian**

Other language(s):

English

LISTENING C1 **READING** C1 **WRITING** C1

SPOKEN PRODUCTION B2 **SPOKEN INTERACTION** B2

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

DIGITAL SKILLS

Ability to use the most important biological databases / Basic knowledge of PyMOL, ChemDraw, Graphpad Prism, CARA and TopSpin / Good user of the Microsoft Office package