Curriculum vitae

PERSONAL INFORMATION

Ettore Bartalucci

Murhaldenweg 10, 8057 Zürich, Switzerland

+39 333 888 77 85

ebartalucci@student.ethz.ch

linkedin.com/in/ettore-b-12136582

Date of birth 14^{th} January 1998 | Nationality Italian

EDUCATION

Sept. 2019 - Ongoing

M.Sc. in Chemistry - Thesis Title: "Sampling of Peptide Chain Conformation Space with Arbitrary Distance Distribution Restraints"

ETH Zürich, *Department of Chemistry and Applied Biosciences, Zürich, Switzerland (CH)*

– Physical Chemistry, Structure Determination of Proteins, Nuclear Magnetic Resonance, Electron Spin Resonance, Atomistic Simulations, Spectroscopy, Computational Chemistry

Oct. 2016 - July 2019

B.Sc. in Chemistry - Thesis Title: "Crystallographic Studies of Human H-Ferritin and its Iron Adduct at pH 6.5"

Università degli Studi di Siena, *Department of Biotechnology, Chemistry and Pharmacy, Department of Excellence 2018-2022, Siena, Italy (IT)*

Sept. 2011 - July 2016

High School Diploma, Human Sciences

Liceo delle Scienze Umane Niccolini Palli, *Livorno, Italy (IT)*

RESEARCH PROJECTS

Feb. 2021 - Present

Sampling of Peptide Chain Conformation Space with Arbitrary Distance Distribution Restraints

Prof. Dr. Jeschke Gunnar, *EPR Spectroscopy Group, Laboratory of Physical Chemistry, ETH Zürich*

Ensemble modelling of intrinsically disordered proteins or protein domains requires generation of a large raw ensemble of peptide chain conformers which are then selected by minimizing the deviation between experimental restraints and ensemble predictions of the restraint data. With the aid of a Rejection-Sampling algorithm, belonging to the field of Monte Carlo techniques for universal sampling, in this Master's Thesis we aim sample of the conformation space guided by arbitrary distance distribution restraints, which can be obtained from pulsed dipolar EPR spectroscopy.

Sept. 2020 - Jan. 2021

5D Solid-State Automated Projection Spectroscopy (APSY) NMR on Biomolecules: Ubiquitin and Hepatitis B Virus Capsid

Prof. Dr. Meier Beat H., *Solid State NMR Group, Laboratory of Physical Chemistry, ETH Zürich*

We applied the 5D SO-APSY NMR technique on protein targets (Ubiquitin and Hepatitis B Virus Capsid) making use of the advantages provided by high fields (850 MHz) and fast magic angle spinning (up to 110 kHz). Combined with automated resonance assignment provided by the algorithm FLYA, the ultimate goal is to bring the method further, to automatically assign large protein systems and their complexes without the need of Human interaction.

March 2020 - July 2020

Photoacoustic studies of coated aerosol droplets optically trapped in air with counter propagating tweezers

Prof. Dr. Signorell Ruth, *Aerosol and Nanoscience Group, Laboratory of Physical Chemistry, ETH Zürich*

Using Lasers as optical traps (CPT), we aimed to investigate the photoacoustic signal generated from single Silica aerosol particles (in the nm-to-μm range) coated with organic substances, and to analyse the composition and size dependence of the photoacoustic signal. We also studied the acoustic properties of the resonant cell, to characterize the presence of biases in the signal measured.

Feb. 2019 - July 2019

Crystallographic Studies of Human H-Ferritin and its Iron Adduct at pH 6.5

Prof. Dr. Mangani Stefano, *Laboratory of Inorganic Chemistry, Università degli Studi di Siena*

By means of X-ray Crystallography, we aimed to determine the effect of a variation in pH on the structure and iron oxidation process of the protein Human H-Ferritin, with particular focus on the ferroxidase site and on the N-terminus of the protein. We investigated if a reduction in pH value modifies the overall structure of the protein. Additionally, we compared the structures of the Human H-Ferritin crystallized with and without Fe(II) diffusion, and determined eventual differences in the active site.

PROFESSIONAL SKILLS

Mother tongue Italian

Other languages

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C2	C2	C1	C1	C1
	Certificate in Advanced English, CEFR level C1, grade B (overall score 194) IELTS Academic (Overall band score 8) - Year 2019				
German	A1	A1	A1	A1	A1
	German Certificate of Achievement from the Language Center of UZH and ETH Zürich (Grade 5.5/6) - Year 2020				
French	A1	A1	A1	A1	A1
	School level				

Levels: A1 and A2: Basic user – B1 and B2: Independent user – C1 and C2: Proficient user
Common European Framework of Reference for Languages

Computational skills

- **Python3**:
  - Numpy, Scipy, Matplotlib, Pandas.
  - Basic knowledge of Scikit-learn, TensorFlow, Keras.
  - Anaconda platform and related features (e.g. Jupyter Notebooks)
- **MATLAB:**
  - Data analysis, mathematical computation algorithm implementation.
- **Linux**
  - Ubuntu distribution

Software skills

- **Molecular Dynamics:**
  - GROMACS, PLUMED, VMD
- **NMR:**
  - Topspin4, CCPNMR suite, Pymol
- **X-ray Crystallography:**
  - CCP4 suite, CCP4mg, Coot
- **Others:**
  - LaTex, Chemoffice suite, OriginLab

Laboratory skills

- **Solid State NMR:**
  - Solid-State 850 MHz magnet preparation for measurements, pulse sequences implementation, MAS rotors spin-up and spin-down, spectral analysis
- **Optical tweezers:**
  - Set-up for single-particle laser traps, particle stabilization through feedback systems (PID controller), broadband light scattering
- **Protein synthesis:**
  - Expression, purification, crystallization, diffraction pattern analysis, structure determination

Driving licence

License B

PUBLICATIONS

Academic Journal Articles

1): *Diveky, Matus E., et al. "Photoacoustics of single aerosol droplets immobilised by counter-propagating optical tweezers." Optical Trapping and Optical Micromanipulation XVII. Vol. 11463. International Society for Optics and Photonics, 2020.*

SPORT & HOBBIES

- **Scuba diving:** PADI Open Water license for dives up to 18 meters
- **Basketball:** Competitive level in various Italian teams (2010-2016, Italian Championship)
- **Triathlon:** Amateur level, short and medium distances
- **Readings:** Scientific topics and classical literature
- **Computational sciences:** I am interested in Programming, Electronic circuits, and Engineering. Whenever time permits, I try to learn the fundamentals of C++ programming, Machine Learning, Deep Learning, Natural Language Processing and techniques for creating digital devices with micro-controllers (e.g. Arduino/Raspberry Pi).

REFERENCES

- **Prof. Dr. Jeschke Gunnar**, *gunnar.jeschke@phys.chem.ethz.ch*, Laboratory of Physical Chemistry, ETH Zürich
- **Prof. Dr. Mangani Stefano**, *stefano.mangani@unisi.it*, Laboratory of Inorganic Chemistry, Università degli Studi di Siena