

CURRICULUM VITAE

NAME: Filippo Favretto

BIRTH: 01/03/1986, Mantova (MN), Italy

ADDRESS: via Mazzini n°43, Roverbella (MN)

PHONE: +39 045 802 7956-7865 | Mobile: +49 1785065682

E-mail: filippo.favretto@univr.it | filippofavretto109@gmail.com



EDUCATION

18th April 2014: Ph.D. in Molecular, Industrial and Environmental Biotechnologies (University of Verona, Italy) under the supervision of Prof. Henriette Molinari.

Thesis title: "NMR interaction studies of Human Liver Fatty Acid Binding Protein with putative ligands and associated proteins".

Tutor: Prof. Michael Assfalg.

Thesis committee: Prof. Roberto Barbato, Prof. Andrea Squartini, Dr. Alma Balestrazzi, Dr. Alex Costa and Dr. Francesco Musiani.

Final grade: "**Excellent**".

17th December 2010: Master degree in Molecular and Industrial Biotechnology (University of Verona, Italy) under the supervision of Prof. Henriette Molinari.

Thesis title: "NMR studies of UIS, a protein involved in malaria parasites development".

Tutor: Prof. Michael Assfalg.

Final grade: **110/110 cum laude**.

16th July 2008: Bachelor degree in Agro-industrial Biotechnology (University of Verona, Italy) under the supervision of Prof. Giovanni Vallini.

Thesis title: "Molecular taxonomy and study of the degradative capacities of PAHs in *Burkholderia* sp. strains".

Tutor: Prof. Silvia Lampis.

Final grade: **110/110 cum laude**.

ACADEMIC AND WORK EXPERIENCES

RESPONSABILITIES

January 2017- December 2020: responsible of a PEAQ-ITC automated (Malvern) and an ÄKTA pure system (GE healthcare).

January 2015- December 2020: responsible of a Bruker AVANCE NEO 800 MHz spectrometer equipped with triple resonance cryo-probe.

RESEARCH EXPERIENCES

1st January 2021 – present: Temporary Assistant Professor (rtdA BIO/10) at the Biochemistry laboratory of the University of Verona, Biotechnology Department.

1st October 2014-31st December 2020: post-doctoral fellow at **German Center for Neurodegenerative Diseases** (DZNE Göttingen, Germany) and guest scientist at the **Max Planck Institute for biophysical chemistry** (MPI-BPC Göttingen, Germany) under the supervision of Prof. Dr. Markus Zweckstetter.

1st January 2014- 1st October 2014: post-doctoral fellow, NMR laboratory of University of Verona (Verona, Italy) under the supervision of Prof. Michael Assfalg.

1st January 2011- 31st December 2013: Ph.D. student in Molecular, Industrial and Environmental Biotechnologies at the NMR laboratory of University of Verona (Verona, Italy) under the supervision of Prof. Henriette Molinari.

TEACHING AND MENTORING ACTIVITIES

1st March – 11th June 2021: Course “Protein misfolding and human diseases” (6CFU), Master’s degree in Molecular and Medical Biotechnology, University of Verona.

1st March – 11th June 2021: Course “Research inspired laboratory” (6CFU), Master’s degree in Molecular and Medical Biotechnology, University of Verona.

21st November 2016: “Introduction to nuclear magnetic resonance spectroscopy”, Bonn-Aachen International Center for Information Technology (B-IT) (*Bonn, Germany*); Prof. Dr. Jürgen Bajorath: **guest lecturer**. Course: **International Life Science Informatics (LSI) Program** *.

20th November 2015: “Introduction to nuclear magnetic resonance spectroscopy”, Bonn-Aachen International Center for Information Technology (B-IT) (*Bonn, Germany*); Prof. Dr. Jürgen Bajorath: **guest lecturer**. Course: **International Life Science Informatics (LSI) Program** *.

2015-present: Supervisor of two undergraduate students and one Ph.D. candidate at the DZNE (Göttingen, Germany) **.

2011-2013: Laboratory assistant in the course: “Organic Chemistry Laboratory” at the University of Verona (Verona, Italy). The course was addressed to bachelor students and included in the degree course “Agro-industrial Biotechnology”.

During his Ph.D., Dr. Filippo Favretto, was supervisor of two bachelor students at the University of Verona.

*See section: **Invited Lectures**.

** As Postdoctoral Researcher, I am constantly training junior colleagues and students, helping them with sample preparation, acquisition of NMR experiments, troubleshooting and presentation of their research findings.

AWARDS AND HONORS

June 2012: Winner of “**COOPERINT 2011**”, international mobility contest organized by University of Verona.

Project title: “Optimization of advanced NMR tools for the characterization of FABP/ligand complexes”.

July 2012- January 2013: As winner of “**COOPERINT 2011**”, Dr. Filippo Favretto was “**Visiting student**” at the Fundación Instituto Leloir, Buenos Aires (Argentina), in collaboration with Prof. Daniel Cicero and Dr. Mariana Gallo.

PUBLICATIONS

† *The authors contributed equally.*

1) Gray Amber LH, Steren CA, Haynes IW, Bermejo GA, **Favretto F**, Zweckstetter M and Do Thanh D, “Structural Flexibility of Cyclosporine A Is Mediated by Amide *Cis-Trans* Isomerization and the Chamaleonic Roles of Calcium”. *J. Phys. Chem. B*, 2021; **Vol. 125(5)**: 1378-1391.

2) Siegert A, Rankovic M, **Favretto F**, Ukmar-Godec T, Strohäker T, Becker S and Zweckstetter M, “Interplay between tau and α -synuclein LLPS”. *Prot. Sci.* 2021.

3) **Favretto F**, Flores D, Baker DJ, Strohäker T, Andreas BL, Blair LBJ, Becker S and Zweckstetter M “Catalysis of proline isomerization and chaperone activity in tug of war”. *Nat. Commun.* 2020; **Vol. 11(6046)**: 1-12.

4) Hamann F[†], Schmitt A[†], **Favretto F**[†], Neumann P, Xiang S, Urlaub H, Zweckstetter M and Ficner R “Structural analysis of the intrinsically disordered splicing factor Spp2 and its binding to the DEAH-box ATPase Prp2”. *PNAS*, 2020; **Vol. 117(6)**: 2948-2956.

5) **Favretto F**, Baker J, Strohäker T, Andreas L, Blair L, Becker S and Zweckstetter M “Molecular basis of the interaction of cyclophilin A with alpha-synuclein”. *Angewandte*, 2020; **Vol. 117(14)**: 5643-5646.

6) Masaracchia C, König A, Valiente-Gabioud AA, Peralta P, **Favretto F**, Strohäker T, Lázaro D F, Zweckstetter M, Fernandez C O and Outeiro T F “Molecular characterization of an aggregation-prone variant of alpha-synuclein used to model synucleinopathies” *Biochim Biophys Acta Proteins Proteom.* 2020; **Vol. 1868(1)**: 140298.

7) Baker J D[†], Shelton L B[†], Zhen D[†], **Favretto F**, Nordhues A N, Darling A, Sullivan L E, Sun Z, Solanki P K, Martin M D, Suntharalingam A, Sabbagh J J, Becker S, Mandelkow E, Uversky V N, Zweckstetter M, Dickey C A, Koren J III and Blair L J “Human Cyclophilin 40 Unravels Neurotoxic Amyloids.” *PLoS Biol.* 2017; **Vol. 15(6)**: e2001336.

- 8) Pérez Santero S, **Favretto F**, Zanzoni S, Chignola R, Assfalg M and D'Onofrio M "Effects of macromolecular crowding on a small lipid binding protein probed at the single-amino acid level". *Arch. Biochem. Biophys.*, 2016; **Vol. 606**:99-110.
- 9) Tenreiro S, Rosado-Ramos R, Gerhardt E, **Favretto F**, Magelhães F, Popova B, Becker S, Zweckstetter M, Braus G H and Outeiro T F "Yeast reveals similar molecular mechanisms underlying alpha- and beta-synuclein toxicity." *Hum Mol Genet.*, 2015; **Vol. 25(2)**: 275-90.
- 10) **Favretto F**, Santambrogio C, D'Onofrio M, Molinari H, Grandori R and Assfalg M "Bile salt recognition by human liver fatty acid binding protein." *FEBS Journal*, 2015; **Vol. 282(7)**: 1271-1288.
- 11) **Favretto F**, Ceccon A, Zanzoni S, D'Onofrio M, Ragona L, Molinari H and Assfalg M "The unique ligand binding features of subfamily-II iLBPs with respect to bile salts and related drugs" *PLEFA*, 2015; **Vol. 95**: 1-10.
- 12) Ragona L, Pagano K, Tomaselli S, **Favretto F**, Ceccon A, Zanzoni S, D'Onofrio M, Assfalg M and Molinari H "The role of dynamics in modulating ligand exchange in intracellular lipid binding proteins." *Biochimica et Biophysica Acta*, 2014; **Vol. 1844**: 1268-1278.
- 13) **Favretto F**, Assfalg M, Gallo M, Cicero D O, D'Onofrio M and Molinari H "Ligand binding promiscuity of human liver fatty acid binding protein: structural and dynamic insights from an interaction study with glycocholate and oleate." *ChemBioChem*, 2013; **Vol. 14**: 1807-1819.
- 14) Santambrogio C, **Favretto F**, D'Onofrio M, Assfalg M, Grandori R and Molinari H "Mass spectrometry and NMR analysis of ligand binding by human liver fatty-acid binding protein." *Journal of mass Spectrometry*, 2013; **Vol. 48**: 895-903.
- 15) **Favretto F**, Assfalg M, Molinari H and D'Onofrio M "Evidence from NMR interaction studies challenges the hypothesis of direct lipid transfer from L-FABP to malaria sporozoite protein UIS3.", *Protein Science*, 2013; **Vol. 22**:133-138.

PUBLISHED ABSTRACTS

- 1) D'Onofrio M, **Favretto F**, Zanzoni S, Pérez Santero S, Assfalg M, Molinari H, Santambrogio C, Grandori R "Understanding promiscuous and selective ligand binding by liver FABP." *Protein Science*, 2015; **Vol. 24**: 6-7.

ORAL PRESENTATIONS

- 19th-21st September 2018**: "Unraveling the role of Cis-Trans Peptidylprolyl Isomerases in Parkinson's Disease" F. Favretto, short oral, *XLVII National Congress on Magnetic Resonance (Torino, Italy)*.
- 4th-8th February 2018**: "Dynamic protein interactions: TIM23ims and MAP/tubulin" F. Favretto, SFB860 Retreat 2018, *Marburger Haus, Sport-und Studienheim der Universität Marburg (Hirschegg, Austria)*.
- 8th-10th June 2017**: "The dynamic nature of Tim50 a key component of the tim23 complex" F. Favretto, SFB860 Symposium 2017, *Tagungshaus "Alte Mensa" (Göttingen, Germany)*.
- 20th-22nd September 2016**: "Toward structural understanding of the TIM23 complex" F. Favretto, SFB860 Retreat 2016, *Waldhotel Berghof (Luisenthal, Germany)*.
- 22nd-24th September 2014**: "Characterization of bile salt binding to recombinant human liver fatty acid binding protein" F. Favretto, short oral, *XLIII National Congress on Magnetic Resonance (Bari, Italy)*.
- 3rd-6th November 2013**: "NMR characterization of bile salt binding by the human liver fatty acid binding protein: towards a better understanding of intracellular lipid shuttling" F. Favretto, short oral, *8th International Conference on Lipid Binding Proteins (La Plata, Argentina)*.
- 10th-12th June 2013**: "NMR study of hlfabp in complex with hydrophobic molecules of biological relevance" F. Favretto, short oral, *5th European Conference Chemistry for Life Sciences (Barcelona, Spain)*.

INVITED LECTURES

- 21st November 2016**: "Introduction to nuclear magnetic resonance spectroscopy", Bonn-Aachen International Center for Information Technology (B-IT) (*Bonn, Germany*); Prof. Dr. Jürgen Bajorath.
- 20th November 2015**: "Introduction to nuclear magnetic resonance spectroscopy", Bonn-Aachen International Center for Information Technology (B-IT) (*Bonn, Germany*); Prof. Dr. Jürgen Bajorath.

CONFERENCE PROCEEDINGS

- 1) **Favretto F**, D'Onofrio M, Zanzoni S, Ceccon A, Silvia Perez Santero, , Molinari H, and Assfalg M. "CHARACTERIZATION OF BILE SALT BINDING TO RECOMBINANT HUMAN LIVER FATTY ACID BINDING PROTEIN" *XLIII National Congress on Magnetic Resonance (Bari, Italy) 22-24 September 2014*.
- 2) **Favretto F**, D'Onofrio M, Zanzoni S, Ceccon A, Assfalg M, and Molinari H, "NMR STUDY OF HLFABP IN COMPLEX WITH HYDROPHOBIC MOLECULES OF BIOLOGICAL RELEVANCE". *5th European Conference Chemistry for Life Sciences (Barcelona, Spain) 10-12 June 2013*.
- 3) **Favretto F**, D'Onofrio M, Zanzoni S, Ceccon A, Assfalg M, and Molinari H. "CHARACTERIZATION OF HUMAN LIVER FATTY ACID BINDING PROTEIN COMPLEXES WITH VARIOUS MOLECULES OF BIOLOGICAL RELEVANCE" *Instruct Biennial Structural Biology Meeting (Heidelberg, Germany) 22-24 May 2013*.
- 4) **Favretto F**, D'Onofrio M, Assfalg M, Gallo M, Cicero D.O, and Molinari H, "BACKBONE DYNAMICS OF HUMAN LIVER FATTY ACID BINDING PROTEIN IN COMPLEX WITH OLEATE AND GLYCOCHOLATE" *XLVIII Annual Meeting for Biochemistry and Molecular Biology (Mendoza, Argentine) 29 October-1 November 2012*.
- 5) **Favretto F**, D'Onofrio M, Zanzoni S, Ceccon A, Assfalg M, and Molinari H, "NMR STUDIES OF THE INTERACTION OF HLFABP WITH UIS, A PROTEIN INVOLVED IN MALARIA PARASITES DEVELOPMENT" *XL National Congress on Magnetic Resonance (Parma, Italy) 29 August-2 September 2011*.

ATTENDED COURSES

- 23rd-27th September 2019:** Bruker Maintenance course: "Troubleshooting", MPI-BPC (Göttingen, Germany).
- 19th-20th November 2018:** Bruker Maintenance course: "Troubleshooting: **cryoprobes**", MPI-BPC (Göttingen, Germany).
- 26th-30th September 2016:** Bruker Maintenance course: "Troubleshooting", MPI-BPC (Göttingen, Germany).
- 2014:** G-NMR school, München (Germany).
- 10th-15th August 2014:** EMBO practical course "Multidimensional NMR in Structural Biology", Joachimsthal (Berlin) (Germany).
- 1st-5th September 2014:** Advanced NMR school, Torino (Italy).
- 21st-25th January 2013:** Practical Course "Advanced methods for the integration of other structural data with NMR data" Sesto Fiorentino (Firenze, Italy).
- 22nd September 2011:** AKTA User Day, Padova (Italy).
- 29th August-2nd September 2011:** Basic NMR school, Villa Gualino, Torino (Italy).

TECHNICAL SKILLS

- Protein purification techniques: affinity chromatography, ion exchange, gel-filtration (including ÄKTA prime and ÄKTA pure systems).
- Biotechnology techniques for gene cloning and site-specific mutagenesis: PCR, cloning, plasmid DNA extraction and purification, gel electrophoresis.
- Biophysical techniques: Isothermal Titration Calorimetry (including automated system PEAQ-ITC and MicroCal ITC systems), Fluorescence Spectroscopy, Circular Dichroism, Microscale Thermophoresis and Dynamic Light Scattering.
- Programming languages and mathematical packages: Python3, MATLAB (basic programming and multiple data fitting), OriginLab and Prism-GraphPad.
- Protein expression in rich, minimal, deuterated and perdeuterated media (from *E. coli*) and selective methyl labeling.
- Advanced knowledge of solution NMR Spectroscopy techniques for protein backbone assignment and [¹⁵N]-backbone NMR relaxation experiments.
- Knowledge of isotope-filtered NMR methods for the study of bio-molecular structure and ligand/protein interactions.
- Backbone assignment of small molecules using 2D homonuclear [¹H-¹H] NMR experiments (COSY, TOCSY and NOESY).
- NMR related software (NMRViewJ, CARRA, CcpNMR Analysis, Sparky, NMRPipe)
- Docking and modeling software (HADDOCK).

- CS-Rosetta to perform *de novo* protein structure determination.

CERTIFICATES

- **June 2020: CS1301xIII: Computing in Python III: Data Structures**, Georgia Institute for technology.
- **May 2020: CS1301xII: Computing in Python II: Control Structures**, Georgia Institute for technology.
- **April 2020: CS1301xI: Computing in Python I: Fundamentals and Procedural Programming**, Georgia Institute for technology.
- **April 2020: Python Data Structures**, University of Michigan.
- **April 2020: Programming for everybody (Getting started with Python)**, University of Michigan.

LANGUAGES

Italian: mother tongue.

English: fluent oral and written.

Spanish: fluent oral.

German: fluent oral (Level B2, Göttingen University).

Il sottoscritto Filippo Favretto, nato a Mantova (MN, Italy) il 01/03/86, codice fiscale FVRFPP86C01E8970, autorizza il trattamento dei dati personali contenuti nel presente curriculum vitae in base all'art. 13 del D. Lgs. 196/2003 e dell'art. 13 GDPR 679/2016. Consapevole che le dichiarazioni false comportano l'applicazione delle sanzioni penali previste dall'art. 46, 47 e 76 del D.P.R. 445/2000, dichiara che le informazioni riportate nel presente *curriculum vitae* sono veritiere.

Luogo e data

Göttingen, 27/06/2020

SIGNATURE: Filippo Favretto

