UNIVERSITÀ DEL PIEMONTE ORIENTALE

Curriculum Vitae

Dr. Petroselli Manuel

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Education:

Nov. 2013 – Feb. 2017: **PhD in "Industrial Chemistry & Chemical Engineering" at Politecnico di Milano (PoliMi)** (Italy)

- Thesis Title: "Aerobic Oxidations catalyzed by *N*-hydroxy compounds: New frontiers in industrial and biological applications" (chemistry and industry part)
- Mentor: Prof. Carlo Punta

Oct. 2010 – Dec. 2012**: Double Master Degree in "Chemistry" at Instituto Superior Tecnico (IST) de Lisboa** (Portugal)

- Thesis Title: "Synthesis of Enantiopure Naphthylureas and attribution of their Absolute Configuration by Molecular Modeling" (Double degree: computational part)
- Mentor: Prof. Luis Felipe Veiros
- Grade: 17/20

Oct. 2010 – Oct. 2012**: Double Master Degree in "Chemistry and Advanced Chemical Methodologies" at University of Camerino** (Italy)

- Thesis Title: "Synthesis of Enantiopure Naphthylureas and attribution of their Absolute Configuration by Molecular Modeling" (Double degree: synthetic part)
- Mentor: Prof. Gianni Palmieri
- Grade: 110/110 with honors, cum laude

Oct. 2007 – June 2010**: Bachelor Degree in "Chemistry" at University of Camerino** (Italy)

- Thesis Title: "Analysis of Organic Compounds in Water solution using Stir Bar Sorptive Extraction (SBSE) technique and GC and MS characterization and determination"
- Mentor: Prof. Stefano Ferraro
- Grade: 110/110 with honors, cum laude.

Research Experience:

Feb. 2025 – Present: **Tenure-Track Assistant Professor at University of Eastern Piedmont** (Italy)

- Research Area: Stimuli-Responsive Dynamic Systems for Applications in Organic Chemistry, Catalysis, and Chemical Biology.

Feb. 2023 – Gen. 2025: **Beatriu de Pinós Postdoctoral Fellow at ICIQ Tarragona** (Spain)

- Research Project: Molecular Recognition and Reactivity in Endo-Functionalized Containers.
- Research Funding: 144 000€ per 3 years (Grant Number: 2021BD00028)
- Collaborator: Prof. Pablo Ballester

March 2020 – September 2021: **Postdoctoral Fellow at ETH Zürich** (Switzerland)

- Research Project: Switchable and Selective Ligands and MRI Contrast Agents for Non-B-Form DNA complexes.
- Mentor: Prof. Yoko Yamakoshi

Dec. 2017 – Jan. 2020: **Postdoctoral Fellow at Shanghai University** (China)

- Research Project: Binding and Reactivity in Water-Soluble Containers
- Mentor: Prof. Julius Jr. Rebek

Nov. 2013 – Feb. 2017: **PhD Student at Politecnico di Milano (PoliMi)** (Italy)

- Research Project: "Aerobic Oxidations catalyzed by *N*-hydroxy compounds: New frontiers in industrial and biological applications"
- Mentor: Prof. Carlo Punta

Oct. 2015 – June 2016**: Visiting PhD Student at University of Ottawa** (Canada)

- Research Project: "Aerobic Oxidations catalyzed by *N*-hydroxy compounds: New frontiers in industrial and biological applications"
- Mentor: Prof. Derek Pratt

Dec. 2012 – Nov. 2013**: Research Fellow at Politecnico di Milano (PoliMi)** (Italy)

- Research Project: "Diversity-Oriented Synthesis of Biologically Relevant Structure by Combination of Multi-Component Reactions"
- Mentor: Prof. Alessandro Volonterio & Prof. Carlo Punta

Publications:

1. **Petroselli M.***, P. Ballester, *Molecular Balances as Physical Organic Chemistry Tools to Quantify Non-Covalent Interactions*, *Chem. Eur. J.*, **2025**, e202404351.

2. Bacchiocchi C., **Petroselli M.***, *Elucidation on the mechanism of the esterification of boric acid with aliphatic diols: A computational study to help set the record straight*, *Chem.Commun.*, **2024**, 60, 13239-13242.
3. Puglisi R., Testa C., Scuderi S., Greco V., Trusso Sfrazzetto G., **Petroselli M.**, Pappalardo A., *Detection of VOCs and Biogenic Amines Through Luminescent Zn-Salen Complex-Tethered Pyrenyl Arms*, *Molecules*, **2024**, 29, 5796-5808.
4. Zhou C., **Petroselli M.**, Bacchiocchi C., Usman R., Wang Z., Henedi H. A., Bin-Jumah M. N., Bushnak I., Rahman F.-U., Khan A., *Acceptor-Induced Cooperative Mixed-Stacking Supramolecular Co-Assembly with Enhanced Emissive Characteristics, Cryst. Growth Des.*, **2024**, *24, 8085-8091*.
5. Puglisi R., Cavallaro A., Pappalardo A., **Petroselli M.**, Santonocito R., Trusso Sfrazzetto G., *A New BODIPY-Based Receptor for the Fluorescent Sensing of Catecholamines, Molecules*, **2024**, 29 (15), 3714-3726.
6. Puglisi R., Mancuso L. M., Santonocito R., Gulino A., […], **Petroselli M.**, Pappalardo F., Zaccaria V., Trusso Sfrazzetto G., *Dopamine Sensing by Fluorescent Carbon Nanoparticles Synthetized by Artichoke Extract, J. Mater. Chem. B*, **2024**, 12, 7826-7836.
7. Santonocito R., Cavallaro A., Puglisi R., Pappalardo A., Tuccitto N., **Petroselli M.**, Trusso Sfrazzetto G., *Smartphone-Based Sensing of Cortisol by Functionalized Rhodamine Probes*, *Chem. Eur. J.*, **2024**, 30, e202401201.
8. Hemmer J. R., Bauernfeind V., Rader C., **Petroselli M.**, Weder C., Berrocal J. A., *Triarylmethane Mechanophores Enable Full-Visible Spectrum Mechanochromism*, *Macromolecules*, **2023**, 56, 21, 8614-8622.
9. **Petroselli M.**, Saccone M., Cametti M., *Aryl Boronic Acids in Columnar Stacked Co-crystalline Materials: A Theoretical Study on the Factor Governing the Assembly*, *ChemPhysChem*, **2023**, e202200883.
10. Cimarelli C., Bacchiocchi C. **Petroselli M.***, Lippolis M., Gentili D., Gabrielli S., *Diastereoselective Synthesis of Secondary Propargyl amines exploiting CuI-based Promoters and Determination of their Relative Configuration by DFT-GIAO Conformational Analysis, Synthesis*, **2023**, 55, 8, 1241-.1252.
11. **Petroselli M.***, *A Phthalocyanine with an Olefine at Its Center as Potential G-Quadruplex Ligand*, *ChemistrySelect*, **2022**, 7, e202202901.
12. **Petroselli M.***, Bacchiocchi C., *Kinetic vs Thermodynamic Control on β-substituted cyclic Ketones: A Theoretical Investigation on Regioselective Formation of Enolates*, *Org. Chem. Front.*, **2022**, 9, 6205-6512.
13. **Petroselli M.**, Chen Y.-Q., Zhao M.-K., Rebek J. Jr., Yang Y., *C-H···X-C Bonds in Non-Activated Alkyl Halides drive Rare Selectivities in Confined Spaces*, *Chin. Chem. Lett.*, **2022**, 34, 107834.
14. **Petroselli M.**, Chen Y.-Q., Rebek J. Jr., Yang Y., Binding and reactivity in deep cavitands based on resorcin[4]arene, *Green Synthesis and Catalysis,* **2021**, 2, 123-130.
15. Caruso M., **Petroselli M.**, Cametti, M., *Design and Synthesis of Multipurpose Derivatives for NHPI-based Catalysis Applications*, *ChemistrySelect*, ***2021**, 6, 12975-12980*.
16. **Petroselli M.**, Yu Y., Rebek Jr. J., *Highly Selective Radical Monoreduction of Dihalides Confined to a Dynamic Supramolecular Host, Chem. Eur. J.*, **2021**, 27, 3284-3287.
17. Grguric T., Cetina M., **Petroselli M.**, Bacchiocchi C., Dzolic Z., Cametti M., *Anion Binding with Biphenyl-bis-Urea Derivatives: Solution and Solid-State Studies*, *New J. Chem,* **2020**, 44, 38, 16294-16301.
18. **Petroselli M.**, Venkatachalam A., Rahman F.-U., Zhao X., Yu Y., Rebek J. Jr., *Radical Reactions in Cavitands Unveil the Effects of Affinity on Dynamic Supramolecular Systems*, *J. Am. Chem. Soc.*, **2020**, 142, 2396-2403.
19. Dobras G., Sitko M., **Petroselli M.**, Caruso M., Cametti M., Punta C., Orlinska B., *Solvent-free Aerobic Oxidation of Ethylbenzene Promoted by NHPI/Co(II) Catalytic System: The Key Role of Ionic Liquids*, *Chem. Cat. Chem.*, **2020**, 12, e1901737.
20. Angamuthu V., Rahman F.-U., **Petroselli M.**, Yangsheng L., Yu Y., Rebek J. Jr., *Mono epoxidation of α,ω-dienes using NBS in a water-soluble cavitand*, *Org. Chem. Front.*, **2019**, 6, 3220-3223.
21. Angamuthu V., **Petroselli M.**, Rahman F.-U., Yu Y., Rebek J. Jr., Binding orientation and reactivity of alkyl α,ω-dibromides in water-soluble cavitands, *Org. Biomol. Chem.*, **2019**, 17, 5279-5282.
22. Rahman F.-U., Ali A., Khan I. U., Bhatti M. Z., **Petroselli M.**, Duong H., Martì-Rujas J., Li Z., Wang H., Zhang D., *Monofunctional supramolecular Pt(II) complexes: Synthesis, single crystal*

structure, anticancer activity, E. coli growth retardation and DNA interaction study, *Inorganic Chemistry Communications*, **2019**, 102, 95-103.

23. Feng H., **Petroselli M.**, Zhang X., Rebek J. Jr., Yu Y., *Cavitands: capture of cycloalkyl derivatives and 2-methylisoborneol (2-MIB) in water*, *Supramolecular Chemistry*, **2019**, 31, 3, 108-113.
24. **Petroselli M.**, Mosca S., Martì-Rujas J., Comelli D., Cametti M., *Mixed Stacked charge-Transfer π-Organic Materials Based on Anthracenyl Boronic Acid*, *Eur. JOC*, **2017**, 7190-7194.
25. **Petroselli M.**, Melone L., Cametti M., Punta C., Lipophilic *N*-Hydroxyphthalimide *Catalysts for the Aerobic Oxidation of Cumene: Towards Solvent-Free Conditions and Back*, *Chem. Eur. J.*, **2017**, 23, 10616-10625.
26. Melone L., **Petroselli M.**, Pastori N., Punta C., *Functionalization of Cyclodextrins with N-hydroxyphthalimide Moiety: A New Class of Supramolecular Pro-oxidant Organocatalysts*, *Molecules*, **2015**, 20, 15881-15892.
27. **Petroselli M.**, Franchi P., Lucarini M., Punta C., Melone L., *Aerobic Oxidation of alkylaromatics using a Lipophilic N-Hydroxyphthalimide: Overcoming the Industrial Limit of Catalyst Solubility*, *ChemSusChem*, **2014**, 7, 2695-2703.

Submitted (* as a corresponding author):

1. Zirpoli G., **Petroselli M.***, *A Versatile Protocol for the Synthesis of Water-Soluble Dynamic Containers* (Communication), *Submitted.*
2. Bai X., Lv Z., **Petroselli M.**, Zou C., Yan F., Zhang Y., Bacchiocchi C., Rahman F.-U., *Visible light excited Pt(II) acetylide complexes bearing red emission: synthesis, characterization, X-ray structure analysis and photoluminescence investigations* (Full Paper), *Submitted.*
3. Wang Z., Zou C., **Petroselli M.**, Bacchiocchi C., Usman R., Yan F., Ma M., Zhang Y., Henidi H., Bin-Jumah M., Bushnak I., Rahman F.-U., Khan A., *Crystal Engineering Approach to Forming Cocrystals of Enaminones: A Pathway to Tunable Solid-State Luminescence" (Full Paper), Submitted.*

Technical skills:

- Multistep organic syntheses (Schlenk line techniques)
- Techniques and methodology on stereoselective and asymmetric syntheses
- Host-guest chemistry and dynamic NMR spectroscopy
- Techniques and methodology on peptide synthesis (SPPS technique)
- Analytical techniques (NMR spectroscopy, GC and LCMS, ESIMS, MALDI-TOF MS, polarimetry, HPLC, ESR spectroscopy, UV-Vis, IR and fluorescence spectroscopy, X-ray)
- Gaussian Software Package

Soft Skills and other Capacities:

The research experiences had in each international research group where I worked, combined with the teaching, supervising and mentoring activities at any level of education (Ph.D, M.Sc. and B.Sc.) and priceless support of great and supportive mentors that I had the luck to meet, allowed me to acquire or improve the following soft skills and capacities:

- Project and time management
- Publication and Grant writing
- Leadership
- Team Work
- Communication skills
- Critical-thinking
- Problem-solving
- Openness to feedback
- Active listening
- Work Ethics
- Emotional intelligence

- Language skills: Italian (Native), English (Fluent), Spanish (Fluent), Catalan (Basic Level).

Teaching Experineces:

Lecture Courses

- Teaching assistant (TA) and Tutoring for M.Sc. course “Supramolecular Chemistry” at Shanghai University held by Prof. Yang Yu (2018-2020 – Total hours: 30). Course language: Chinese and English.

- Teaching assistant (TA) for M.Sc. course “Supramolecular Chemistry” (Organic Chemistry VII) at ETH Zurich held by Prof. Yoko Yamakoshi and Dr. Bartosz Lewandowski (Spring semester 2021 – Total hours: 20). Course language: English

- Professor in charge of the B.Sc. course “Organic Chemistry” at University of Eastern Piedmont (Spring semester 2025 – Total hours: 92). Course language: Italian/English

- Professor in charge of the M.Sc. course “Bioinorganic and Supramolecular Chemistry” at University of Eastern Piedmont, shared with Prof. Lorenzo Tei (Autumn Semester 2026 – Total hours: 24). Course language: Italian/English

Teaching in Laboratory Courses

- Teaching assistant (TA) for B.Sc. course “General and Organic Chemistry” at Politecnico di Milano held by Prof. Giuseppina Raffaini containing laboratory experiments and lectures (Spring semester 2014 and 2015 – Total hours: 40). Course language: Italian and English.

Tutoring Services

- Tutoring for “Organic Chemistry” at the Università di Camerino (2008-2012 – Total hours: 150). Course language: Italian and English.

- Tutoring for “Organic Chemistry” at Politecnico di Milano (2014-2017 – Total hours: 60). Course language: Italian and English

Supervising and Mentoring Activities:

- **6 Bachelor Students:** four at Politecnico di Milano (2013-2016) and two at ETH Zürich (2020-2021) from three different nationalities.

- **5 Master Students:** one at Politecnico di Milano (2016-2017), one at Shanghai University (2018-2019), one at ETH Zürich (2020-2021) and two at ICIQ Tarragona (2023-Present) from four different nationalities.

- **6 PhD Students:** one visiting PhD student at Politecnico di Milano (four months in 2017), three at ETH Zürich (2020-2021) and two at ICIQ Tarragona (2023 – Present) from five different nationalities.

Awards & Grants:

- PhD Program Grant at Politecnico di Milano, 2013-2016 (≈ 70 000€)

- Erasmus Mobility Program at Politecnico di Milano, 2015-2016 (≈ 4 000€)

- Awarded with the Beatriu de Pinos Grant, 2023-2026 (≈ 144 000€) for the project "Water-Soluble Supramolecular Hosts for Applications in Radical Chemistry and Chemical Biology" (2021 BD 00028).

- Awarded with the RTD-A PNRR position at the University of Pisa (RTD_RIC2022PNRR-5_A2) in December 2022. Declined in place of the Beatriu de Pinos Grant (2021 BD 00028).

- Short-listed for "La Caixa – Junior Group Leader Fellowship" (Most competitive grant in Spain for Young Researcher)

- Awarded with the Tenure-Track Assistant Professor position (2024-RTT-02) at the University of Eastern Piedmont (UPO) in October 2024 (Starting date: February 2025).

Reviewer Experience:

- 2018-present: Eur. JOC; Org. Biomol. Chem.; New J. Chem.; Chem. Med. Chem.; RSC Advances;

- 2022-present: Added to the Royal Chemical Society (RSC) Reviewer Database.

- 2023-present: Added to the American Chemical Society (ACS) Reviewer Database through ACS Reviewer Lab.

Other activities:

- Laboratory Chief in Ballester Group at ICIQ Tarragona (2023-2024).
- Laboratory Chief in Yamakoshi Group at ETH Zurich (2020-2021).
- Safety Officer in Rebek Group at Shanghai University (2018-2019)

Oral and Poster presentation:

- **Oral Communication** to EUCHEM Conference on Organic Free-Radicals, July 2014, Prague (CZ).
  Topic: Aerobic Oxidation of Alkylaromatics catalyzed by a New Lipophilic N-Hydroxyphthalimide (NHPI).

- **Oral Communication** to 3th International Symposium on Green Chemistry, May 2015, La Rochelle (FR).
  Topic: Towards a Sustainable Process for the Aerobic Peroxidation of Alkylaromatics catalyzed by N-hydroxiphthalimide: Reduced use of solvents, recovery of the catalysts and sunlight photo-activation.

- **Poster** to EUCHEM Conference on Organic Free-Radicals, June 2018, Marseille (FR).
  Topic: Binding and Reactivity in Water-Soluble Cavitands.

- **Oral Communication** to "Chemistry Seminar" at Politecnico di Milano, June 2018, Milan (IT).
  Topic: Radical Reactions in Water-Soluble Cavitands.

- **Oral Communication** to "Chemistry at SHU" in honor of visiting Professor Peter Stang, July 2019, Shanghai (PRC).
  Topic: Water-Soluble Cavitands as nano-containers for selective radical reactions.

- **Oral Communication** to "Internal Chemistry Seminar" at ETH Zurich, April 2020, Zurich (CH).
  Topic: Dynamic NMR Spectroscopy: Reactions in Dynamic Supramolecular Hosts.

- **Oral Communication** to "International Symposium on Macrocycle and Supramolecular Chemistry (ISMSC), May 2024, Hangzhou (PRC). **Topic**: Quantification of Carboxylate-π Interactions in Water.

- **Oral Communication** to "Girona Seminar 2024", May 2024, Girona (ES). **Topic**: Quantification of Carboxylate-π Interactions in Water.

Institution Responsabilities:

- Person in charge for the EPR machine at ETH Zürich (2021)
- Person in charge for Reveleris@X2 Flash Chromatography System at ETH Zürich (2020-2021)
- Person in charge for distillation apparatus and rotary evaporators at Shanghai University (2017-2019)

Research Indicators:

Total number of articles: **27**
Total number of citations: **320**
H-Index: **11**

CV Summary:

In 2013, Dr. Petroselli was **awarded with the PhD Program Grant (2013-2016) at Politecnico di Milano** (Ranked Top150 in the World in 2023) **where he received his PhD in 2017** under the supervision of Prof. Carlo Punta, working on radical processes catalyzed by N-OH compounds and **awarded with the final mark of "Merit" by an international committee**. PhD Program Grant at Politecnico di Milano is a competitive grant, open to worldwide candidates and sponsored by Politecnico di Milano, that covers gross salary for 3 years (≈70 000€) to the best 6 applicants. He expanded his knowledge in radical chemistry at the **University of Ottawa (10 months as visiting PhD)**, where he worked on dynamic pro-oxidants based on N-OH compounds for the modern anticancer oxidative therapy, under the supervision of Prof. Derek Pratt. His **PhD work produced 4 papers (3 as first author)**, including a *ChemSusChem* and *Chem. Eur. J.* where innovative lipophilic N-OH catalysts have been designed and studied in non-polar environments (e.g. neat cumene) for the first time, reporting catalytic properties totally unexpected and a higher productivity of the entire oxidation process. This stunning result led to a **collaboration (2 months) with Sigma Aldrich Italia** for the commercialization of lipophilic N-hydroxyphthalimides, highlighting the high impact and innovation of the proposed research. In December 2017, he started his academic career at **Shanghai University as a junior PDRA** under the supervision of Prof. Julius Jr. Rebek and Prof. Yang Yu. **His research moved from catalysis to supramolecular chemistry** and it was focused on the synthesis of water-soluble cavitands based on resorcin[4]arene and their applications as nano-reactors for chemical reactions, with particular interest for radical processes. In two years (2018-2019), **7 papers (4 as first author) were published in high-impact journals, highlighting a *J. Am. Chem. Soc.* (JACS)** where radical processes have been reported for the first time in water-soluble synthetic receptors, called cavitands, helping to shed light on the action mechanisms in biological enzymes. The published JACS paper and sequel publication (*Chem. Eur. J.* in 2021) reported precise guidelines, applicable to any supramolecular system, on how to perform radical processes in dynamic molecular receptors. In 2020, he **joined the Yamakoshi Group at ETH Zurich as a senior PDRA working at the interface between chemistry and chemical biology** in the development of i) supramolecular MRI contrast agents and ii) selective porphynoids based ligands for Non B-DNA complexes. In this context, he **published a single-author paper** in *ChemistrySelect* journal, demonstrating his scientific independence and capability of generating new knowledge. Two more manuscripts, resulting from his postdoctoral work and ideas, are currently under submission in high-impact journals where **he is the corresponding-author**. In 2021, his Father passed away due to COVID infection and from October 2021 to January 2023 (14 months), he supported his family in Italy, taking an **interruption period** from the laboratory activities. In this time, **he continued to be scientifically active**, establishing independent collaborations that produced 4 papers. In December 2022, **he was awarded with the RTD-A PNRR position**

(RTD_RIC2022PNRR-5_A2) at the University of Pisa (Top100 in Europe in 2023), which is a non-tenure-track assistant professor position for a 3-years period. However, he declined the offer and **accepted the Beatriu de Pinós Postdoctoral Grant (2021 BD 00028) for the 3-years-period 2023-2026 (≈ 144 000€) at ICIQ Tarragona** where he worked on the project entitled "Chemical Reactivity in Endo-Functionalized Containers" in the group of Prof. Pablo Ballester. In October 2024, he was **awarded with the Tenure-Track Assistant Professor position (2024-RTT-02) at the University of Eastern Piedmont (UPO) where he established his research group in February 2025.**

During past 5 years, **he established an independent international network, reflected on 8 published articles, 1 as sole corresponding, 2 as co-corresponding, 1 as first, and 4 as co-author**. Dr. Petroselli showed excellent leadership skills to date, highlighted by the following evidences: i) Design of research projects and promote collaborative research lines with international groups where he was involved in the design and performance of the experiments, active discussions with collaborators and data analyses. The **leadership in these tasks was acknowledge with the corresponding author role**; ii) **single author paper** where he significantly expanded the funded SNF-project SJSSTP-JSPS (2019-present) awarded to Prof. Yamakoshi at ETH Zurich; iii) **independent collaborations** with *Prof. Massimo Cametti at PoliMi* (2016-present); *Dr. Corrado Bacchiocchi at UniCam* (2018-present); *Prof. Giuseppe Trusso Sfrazzetto at UNICT* (2023-present), *Dr. Josè Augusto Berrocal at ICIQ* (2023-present); and Prof. Faiz-Ur Rahman at *Inner Mongolia University* (2024-present). iv) supervision and mentoring of PhD (6), M.Sc. (6) and B.Sc. (6) students from 8 different nationalities in the last ten years (2013-2023), including a Summer Fellow from KCL (Summer 2023) and a visiting master student from UniCT at ICIQ Tarragona (Spring 2023); v) **institutional responsibilities where he guides other personnel** such as: a) person in charge for the EPR machine at ETH Zurich (2021), b) person in charge for Reveleris@X2 Flash Chromatography System at ETH Zurich (2020-2021), c) laboratory chief in Yamakoshi Group at ETH Zurich (2020-2021) and d) safety officer in Rebek Group at Shanghai University (2017-2019). He has **attended 8 international and national conferences** (7 oral communications and 1 poster presentation) and he is part of the Royal Society of Chemistry's and American Chemical Society's reviewer database since 2022 and 2023, respectively.

In summary, these achievements reflect the **advanced scientific development and international visibility** of Dr. Petroselli. Moreover, it shows the maturity of a broad range of 'beyond-the-bench' skills, highlighting mentorship, communication skills and project management, as well as important soft skills such as **creative and critical thinking, leadership, teamwork and adaptability**.