SIMONE ADORINNI

DATE OF BIRTH: May 16th 1995

PERSONAL STATEMENT

I am an interdisciplinary chemist with international postdoctoral experience and a strong background in supramolecular chemistry, peptide self-assembly, carbon nanomaterials, and metal-organic cages. My research focuses on connecting molecular-level design with functional properties, contributing to the development of new molecular systems with potential biological applications in collaborative and interdisciplinary contexts.

EDUCATION

11/2020 – 03/2024 Ph.D. Degree in Chemistry (Honours)

Dept. of Chemical and Pharmaceutical Sciences, University of Trieste, Trieste (Italy)

Supervisor - Prof. Silvia Marchesan

09/2022 Research period in the group of Prof. J.R. Nitschke at University of Cambridge, UK (1 month)

10/2017 – 04/2020 Master Degree in Chemistry, 110/110 with Honours

Dept. of Chemical and Pharmaceutical Sciences, University of Trieste, Trieste (Italy)

Supervisor - Prof. Silvia Marchesan; Co-Supervisor – Prof. Luca Dell' Amico (Univ. Of Padova, IT)

10/2014 – 09/2017 Bachelor Degree in Chemistry, 108/110

Dept. of Chemical and Pharmaceutical Sciences, University of Trieste, Trieste (Italy)

Supervisor - Prof. Barbara Milani

RESEARCH EXPERIENCE

8/2024 – present Postdoctoral researcher

Yusuf Hamied Department of Chemistry, University of Cambridge, **Cambridge (UK)**

Supervisor – Prof. Jonathan R. Nitschke

3/2024 – 7/2024 Postdoctoral researcher

Dept. of Chemical and Pharmaceutical Sciences, University of Trieste, Trieste (Italy)

Supervisor – Prof. Silvia Marchesan

EXPERTISE AND TECHNICAL SKILLS

Self-Assembling Peptides – Design, Synthesis, and Applications

- Solid and liquid phase synthesis of peptides.
- Design and characterisation of soft materials based on self-assembling peptides.
- Use of peptide-based hydrogel for applications in biomedicine (*e.g.*, insulin aggregation inhibitors, antimicrobial peptides, and drug release) and organocatalysis.
- Development of supramolecular photocatalysts for stereoselective organic synthesis.

Functionalization of Carbon Nanomaterials

- Covalent functionalisation of carbon nanomaterials

- Non-covalent functionalisation of carbon nanomaterials by weak interactions with aromatic molecules.
- Characterisation of functionalised carbon nanomaterials.
- Design of biocompatible and stable nanocomposite hydrogels based on peptides and carbon nanomaterials.

Metal-organic Cages

- Synthesis and characterisation of organic aromatic compounds by cross-coupling, aldolic and nucleophilic substitution reaction.
- Synthesis and characterisation of organometallic complex with both air-sensitive (Fe (II), Cu (I)) and air stable metals (Zn (II), Co (II), Ag (I)).
- Synthesis and characterisation of discrete coordination cages and interlocked 2D materials.
- Synthesis and characterisation of soft materials based on metal-organic cages, as ionic liquids and organogels.
- Host-guest chemistry studies.

Analytical and Spectroscopic Techniques

- Chromatography & Mass Spectrometry: HPLC, LC-MS, HR-MS.
- NMR Spectroscopy: 1D, 2D, DOSY, heteronuclear (^{13}C, ^{15}N, ^{109}Ag), variable-temperature studies.
- Vibrational Spectroscopy: IR, nano-IR, Raman, resonance Raman.
- Calorimetry: DSC, TGA for thermal stability profiling.
- Optical Techniques: UV-Vis, fluorescence spectroscopy, DLS.
- Electron Microscopy: TEM and SEM for morphological characterization

CONFERENCES

08/10-11/10/2025 ACS Global Scientific Conference - Victor Menezes Convention Centre, Indian Institute of Technology Bombay, IN. Invited Oral presentation

21/09-25/09/2025 XLII Convegno Nazionale Della Divisione Di Chimica Organica, Villasimius-Cagliari, IT. Oral presentation.

26/08-30/08/2024 XXVIII National Congress of the Italian Chemical Society, Milan, IT. Oral presentation.

25/08-29/08/2024 37th European Peptide Congress, Florence, IT. Invited Oral presentation.

05/06-07/06/2023 IOPC 2023, Milan, IT. Oral presentation and poster.

18/07-21/07/2022 "Catalysis Fundamentals and Practice" University of Liverpool, UK. Poster.

09/30/2021 Young Chemists' Network in Friuli Venezia Giulia, University of Trieste, IT. Oral presentation

14/09-23/09/2021 National Congress of the Italian Chemical Society, Milan, IT. Poster.

AWARDS

10/2025 E-COST SNOOPY Grant (CA23111) - European competitive travel grant

10/2025 SCI-ORG Outgoing Fellowships - Italian competitive travel grant

04/2025 1st Generation Travel Grant – International travel grant from W.I.S.C.

08/2024 CARLO PEDONE NATIONAL AWARD - For the best PhD thesis in the field of peptide science

09/2022 E-COST Essence Grant (CA19118) - European competitive travel grant

09/2022 E-COST Eutopia Grant (CA17139) - European competitive travel grant

07/2022 Royal Society of Chemistry (UK) SURCAT Scholarship, International travel grant

TEACHING EXPERIENCE

10/2024-03/2025 Senior Demonstrator. **University of Cambridge.**

10/2021-12/2022 Tutoring for "General Chemistry with Laboratory" **University of Trieste.**

PEER-REVIEW EXPERIENCE

- *Nature* – Nature Publishing Group
- *Nature Materials* - Nature Publishing Group
- *Nature Communications* (4 reviews) – Nature Publishing Group
- *Communications Chemistry* – Nature Publishing Group
- *Journal of the American Chemical Society* – American Chemical Society
- *Chemistry of Materials* – American Chemical Society
- *Small Structures* – Wiley-VCH
- *Asian Journal of Organic Chemistry* – Wiley-VCH
- *Chemistry – an Asian Journal* (2 reviews) – Wiley-VCH
- *Macromolecular Bioscience* – Wiley-VCH
- *Colloids and Surfaces B: Biointerfaces* (5 reviews) – Elsevier

SCIENTIFIC PUBLICATIONS

1. Manas-Torres, M. C., Aletto, P., **Adorinni, S.**, Vargiu, A. V., de Cienfuegos, L. A. & Marchesan, S. Racemic peptide assembly boosts biocatalysis. *Org. Biomol. Chem.* **23**, 2797 (2025).
2. **Adorinni, S.**, Gentile, S., Bellotto, O., Kralj, S., Parisi, E., Cringoli, M. C., Deganutti, C., Malloci, G., Piccirilli, F., Pengo, P., Vaccari, L., Geremia, S., Vargiu, A. V., De Zorzi, R. & Marchesan, S. Peptide stereochemistry effects from pKa-shift to gold nanoparticle templating in a supramolecular hydrogel. *ACS Nano* **18**, 3011 (2024).
3. **Adorinni, S.**, Kurbasic, M., Garcia, A. M., Kralj, S., Bellotto, O., Scarel, E., Pengo, P., De Zorzi, R., Melchionna, M., Vargiu, A. V. & Marchesan, S. A water playground for peptide re-assembly from fibrils to plates. *J. Mater. Chem. B* **12**, 12589 (2024).
4. Li, M., Zhu, H., **Adorinni, S.**, Xue, W., Heard, A., Garcia, A. M., Kralj, S., Nitschke, J. R. & Marchesan, S. Metal ions trigger the gelation of cysteine-containing peptide-appended coordination cages. *Angew. Chem. Int. Ed.* **63**, e202406909 (2024).
5. Rosetti, B., Kralj, S., Scarel, E., **Adorinni, S.**, Rossi, B., Vargiu, A. V., Garcia, A. M. & Marchesan, S. Insulin amyloid fibril formation reduction by tripeptide stereoisomers. *Nanoscale* **16**, 11081–11089 (2024).
6. **Adorinni, S.**, Goti, G., Rizzo, L., Grassi, F., Kralj, S., Matroodi, F., Natali, M., De Zorzi, R., Marchesan, S. & Dell'Amico, L. Self-assembly of benzophenone–diphenylalanine conjugate into a nanostructured photocatalyst. *Chem. Commun.* **59**, 7619 (2023).
7. Rozhin, P., **Adorinni, S.**, Iglesias, D., Mackiol, T., Kralj, S., Bisetto, M., Abrami, M., Grassi, M., Bevilacqua, M., Fornasiero, P. & Marchesan, S. Nanocomposite hydrogels with self-assembling peptide-functionalized carbon nanostructures. *Chem. Eur. J.* **29**, e202301708 (2023).
8. Parisi, E., **Adorinni, S.**, Garcia, A. M., Kralj, S., De Zorzi, R. & Marchesan, S. Self-assembling tripeptide forming water-bound channels and hydrogels. *J. Pept. Sci.* **29**, e3524 (2023).
9. Marin, D., Bartkowski, M., Kralj, S., Rosetti, B., D'Andrea, P., **Adorinni, S.**, Marchesan, S. & Giordani, S. Supramolecular hydrogels from a tripeptide and carbon nano-onions for biological applications. *Nanomaterials* **13**, 172 (2023).
10. Melchionna, M., Moro, M., **Adorinni, S.**, Nasi, L., Colussi, S., Poggini, L., Marchesan, S., Valenti, G., Paolucci, F., Prato, M. & Fornasiero, P. Driving up the electrocatalytic performance for carbon dioxide conversion through interface tuning in graphene oxide–bismuth oxide nanocomposites. *ACS Appl. Energy Mater.* **5**, 13356 (2022).

11. Scarel, E., Pierri, G., Rozhin, P., **Adorinni, S.**, Polentarutti, M., Tedesco, C. & Marchesan, S. Self-assembly and gelation study of dipeptide isomers with norvaline and phenylalanine. *Chemistry* **4**, 1417 (2022).
12. Rosetti, B., Scarel, E., Colomina-Alfaro, L., **Adorinni, S.**, Pierri, G., Bellotto, O., Mamprin, K., Polentarutti, M., Bandiera, A., Tedesco, C. & Marchesan, S. Self-assembly of homo- and hetero-chiral cyclodipeptides into supramolecular polymers towards antimicrobial gels. *Polymers* **14**, 4554 (2022).
13. Mosetti, V., Rosetti, B., Pierri, G., Bellotto, O., **Adorinni, S.**, Bandiera, A., Adami, G., Tedesco, C., Crosera, M., Magnano, G. C. & Marchesan, S. Cyclodipeptides: From their green synthesis to anti-age activity. *Biomedicines* **10**, 2342 (2022).
14. Jahović, I., Zou, Y.-Q., **Adorinni, S.**, Nitschke, J. R. & Marchesan, S. Cages meet gels: Smart materials with dual porosity. *Matter* **4**, 2123 (2021).
15. **Adorinni, S.**, Rozhin, P. & Marchesan, S. Smart hydrogels meet carbon nanomaterials for new frontiers in medicine. *Biomedicines* **9**, 570 (2021).
16. **Adorinni, S.**, Cringoli, M. C., Perathoner, S., Fornasiero, P. & Marchesan, S. Green approaches to carbon nanostructure-based biomaterials. *Appl. Sci.* **11**, 2490 (2021).
17. Caporale, A., **Adorinni, S.**, Lamba, D. & Saviano, M. Peptide–protein interactions: From drug design to supramolecular biomaterials. *Molecules* **26**, 1219 (2021).

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Cambridge, 16/07/2025

Applicant's signature

Digitally signed by ADORINNI SIMONE C=IT

Dr. Simone ADORINNI