FEDERICO PUPILLI

CONTACTS

- federico.pupilli@issmc.it
- Italian citizenship
- Faenza, Ravenna

CERTIFICATIONS

- **E-Chem Certificate**, University of Perugia, Perugia, Field: Organic Chemistry 3, June 2019, Grade: Excellent.
- **Technology Transfer, Entrepreneurship and European Funding Schemes to Support Innovation Training Course**, CNR-ISSMC, Faenza, January 29 - February 2, 2024, Grade: Completed.
- **1St School of Supramolecular and Bio-Nanomaterials**, Lake Como School of Advanced Studies, June 13-17, 2022, Grade: Completed.

LANGUAGES

- **English**
  Comprehension: Advanced
  Spoken: Advanced
  Written: Advanced
- **Spanish**
  Comprehension: Advanced
  Spoken: Intermediate
  Written: Intermediate

PROFESSIONAL EXPERIENCES

Research Fellow, 10/2024 – Present
Institute of Science, Technology and Sustainability for the Development of Ceramic Materials (ISSMC-CNR) – Faenza (RA)
Activities carried out:

- Synthesis and chemical-physical characterization of medicated scaffolds for metastatic bone tissue regeneration.
- Optimization of drug functionalization process and evaluation of the related release profiles.

Research Fellow, 10/2021 – 09/2024
Department of Chemical Sciences (DiSC), University of Padua – Padua (PD)
Institute of Science, Technology and Sustainability for the Development of Ceramic Materials (ISSMC-CNR) - Faenza (RA)
Activities carried out:

- Synthesis and characterization of calcium phosphate-based nanoparticles/nanorods, introduction of various bioactive ionic dopants (Mg^{2+}, Fe^{2+}, Fe^{3+}, Sr^{2+}, CO_3^{2-}, Zn^{2+}).
- Development of materials with 2D aligned microarchitectures used as cell guides.
- Biological evaluation of calcium phosphate nanoparticles and 2D materials.
- Functionalization of calcium phosphate nanoparticles with antibiotic and anticancer drugs and study of their release kinetics.

EDUCATION

PhD, 10/2021 – 03/2025
Department of Chemical Sciences (DiSC), University of Padua– Padua (PD)
Institute of Science, Technology and Sustainability for the Development of Ceramic Materials (ISSMC-CNR) - Faenza (RA)
Thesis title*:*
Biomimetic Nano-Apatites: Guiding Crystal Growth and Surface Chemistry to Direct Cellular Behaviour.

Master's Degree in Chemistry (110/110), 10/2019 – 09/2021
Department of Chemical Sciences (DiSC), University of Padua– Padua (PD)
Thesis title*:*
Passivated gold nanoparticles with mixed monolayers as catalysts for aldol addition reactions.

Bachelor's Degree in Chemistry (110L/110), 10/2016 – 09/2019
University of Perugia – Department of Chemistry, Biology and Biotechnology– Perugia (PG)
***Thesis title**:*
Preparation of diaryodonium salts for C-H arylation protocols.

Scientific high school diploma (92/100): 07/2016
Galeazzo Alessi Scientific High School– Perugia (PG)

TECHNICAL KNOWLEDGE

- Synthesis, purification and analysis of organic compounds.
- Synthesis and analysis of nanostructured compounds (Au, calcium phosphates).
- Synthesis and analysis of ceramic materials for biomedical applications.
- X-ray powder diffraction (PXRD).
- Spectroscopic techniques (UV-Vis, IR, NMR, 2D NMR).
- Spectrometric techniques (ESI-MS).
- Thermogravimetric analysis techniques (TG-DSC).
- Scanning electron microscopy (SEM), optical microscopy, inverse fluorescence microscopy.
- Colloidal property analysis techniques on aqueous dispersions (DLS, Zeta potential).
- High Performance Liquid Chromatography (HPLC).
- 2D cell culture, cell viability assays (MTT assay, Live and Dead assay).
- Cell fixation and staining.
- Quantitative real-time PCR (qRT-PCR).
- Data analysis and presentation development skills (MS Office, Origin, Matlab, GraphPad, Imaj, Chemdraw, Reaxys, Biorender, Photoshop).

PERIODS ABROAD

Mobility Period funded by the Journal of European Ceramic Society (JECS), May 2023 – July 2023
INP-CIRIMAT Toulouse, France
Activity: Development of new Mg-doped hydroxyapatite nanorods for biomedical applications: spectroscopic analysis of surface characteristics.

EF High School Exchange Program
Castleblayney College Castleblayney, Co. Monaghan, Ireland
September 2014 - April 2015

PUBLICATIONS

- **Pupilli, F.**; Ruffini, A.; Dapporto, M.; Tavoni, M.; Tampieri, A.; Sprio, S. Design Strategies and Biomimetic Approaches for Calcium Phosphate Scaffolds in Bone Tissue Regeneration. Biomimetics. MDPI September 1, 2022. https://doi.org/10.3390/biomimetics7030112.

- Inam, H.; Sprio, S.; Tavoni, M.; Abbas, Z.; **Pupilli, F.**; Tampieri, A. Magnetic Hydroxyapatite Nanoparticles in Regenerative Medicine and

Nanomedicine. Int J Mol Sci 2024, 25 (5), 2809. https://doi.org/10.3390/ijms25052809.

- **Pupilli, F.**; Tavoni, M.; Drouet, C.; Tampieri, A.; Sprio, S. Iron-Doped Hydroxyapatite by Hydrothermal Synthesis: Factors Modulating the Fe2+, Fe3+ Content. Open Ceramics 2024, 18, 100610. https://doi.org/10.1016/j.oceram.2024.100610.

- **Pupilli, F.**; Tavoni, M.; Marsan, O.; Drouet, C.; Tampieri, A.; Sprio, S., Tuning Mg Doping and Features of Bone-like Apatite Nanoparticles Obtained via Hydrothermal Synthesis, Langmuir (2024). https://doi.org/10.1021/acs.langmuir.4c02035.

- Inam, H.; Degli Esposti, L.; **Pupilli, F.**; Tavoni, M.; Casoli, F.; Sprio, S.; Tampieri, A. Iron-Doped Hydroxyapatite Nanoparticles for Magnetic Guided siRNA Delivery. International Journal of Molecular Sciences. 2025; 26(16):7712. https://doi.org/10.3390/ijms26167712

DISSEMINATION ACTIVITIES

Poster

- Bioceramics 32, the 32nd Symposium and Annual Meeting of ISCM, Venice-Mestre, September 20-23, 2022.
- 1st School of Supramolecular and Bio-Nanomaterials, Lake Como School of Advanced Studies, June 13-17, 2022.

Oral

- 20° Young Researchers Conference Materials Science and Engineering, Belgrade, Serbia, November 30 – December 2, 2022.
- Bioceramics 33, the 33rd Symposium and Annual Meeting of ISCM, Solothurn, Switzerland, October 17-20, 2023.
- Annual meeting of Italian Society for Biomaterials (SIB) Faenza, Italy, July 8-10 2024.

CONSENT

I authorize the processing of my personal data contained in my curriculum vitae pursuant to art. 13 of Legislative Decree 196/2003 and art. 13 of EU Regulation 2016/679 on the protection of individuals concerning the processing of personal data.

Faenza, 01/10/2025