

Curriculum Vitae of Farid Hajareh Haghighi

Personal Information

- Name Farid
- Surname Hajareh Haghighi

Education and Research Experience

- Date 12-01-2020 to present
- Sapienza University of Rome Chemical Sciences (Researcher at the Nanomaterials laboratory of the Department of Chemistry).
- Date 09-06-2009 to 07-22-2018
- Isfahan University of Technology (Iran) Inorganic Chemistry (formal Master's degree (average score: 18.95/20)).
- Date 09-06-2005 to 08-06-2009
- Shiraz University (Iran) Pure Chemistry (formal Bachelor's degree with the average score of 17.32/20).
- Date 09-22-2000 to 06-21-2002
- Shahid Molaei high school (Iran) Mathematics and Physics (formal Diploma with the average score of 16.45/20).

Scientific Publications

- 1 **Farid Hajareh Haghighi**, Roya Binaymotlagh, Ilaria Fratoddi, Laura Chronopoulou, Cleofe Palocci, "Peptide-hydrogel nanocomposites for anti-cancer drug delivery", *Gels*, **2023**, submitted manuscript (**Review Article**, 10-30-2023, Manuscript ID: gels-2718830).
- 2 Roya Binaymotlagh, **Farid Hajareh Haghighi**, Enea Gino Di Domenico, Francesca Sivori, Mauro Truglio, Alessandra Del Giudice, Ilaria Fratoddi, Laura Chronopoulou, Cleofe Palocci, "Biosynthesis of peptide hydrogels@titania nanoparticles composites with antibacterial properties", *Gels*, **2023**, submitted manuscript (10-31-2023, Manuscript ID: gels-2720730).
- 3 **Farid Hajareh Haghighi**, Roya Binaymotlagh, Laura Chronopoulou, Sara Cerra, Andrea Giacomo Marrani, Francesco Amato, Cleofe Palocci, Ilaria Fratoddi, "Self-assembling peptide-based magnetogels for the removal of heavy metals from water", *Gels*, **2023**, 9, 621, DOI: 10.3390/gels9080621.
- 4 Sara Cerra, Valentina Dini, Tommaso Alberto Salamone, **Farid Hajareh Haghighi**, Martina Mercurio, Antonella Cartoni, Alessandra Del Giudice, Martina Marsotto, Iole Venditti, Chiara Battocchio, Francesca Anna Scaramuzzo, Roberto Matassa, Stefania Nottola, Riccardo Faccini, Riccardo Mirabelli, Ilaria Fratoddi, "Acrylates-based hydrophilic co-polymeric nanobeads as nanocarriers for imaging agents", *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, **2023**, 674, 131829, DOI: 10.1016/j.colsurfa.2023.131829.

- 5 Sara Cerra, Laura Carlini, Tommaso Alberto Salamone, **Farid Hajareh Haghghi**, Martina Mercurio, Beatrice Pennacchi, Carla Sappino, Chiara Battocchio, Stefania Nottola, Roberto Matassa, Ilaria Fratoddi, "Noble metal nanoparticles networks stabilized by rod-like organometallic bifunctional thiols", *ChemistrySelect*, **2023**, 8, e202300874, DOI: 10.1002/slct.202300874.
- 6 Laura Chronopoulou, Roya Binaymotlagh, Sara Cerra, **Farid Hajareh Haghghi**, Enea Gino Di Domenico, Francesca Sivori, Ilaria Fratoddi, Silvano Mignardi, Cleofe Palocci, "Preparation of hydrogel composites using a sustainable approach for in situ silver nanoparticles formation", *Materials*, **2023**, 16, 2134, DOI: 10.3390/ma16062134.
- 7 **Farid Hajareh Haghghi**, Martina Mercurio, Sara Cerra, Tommaso Alberto Salamone, Roya Binaymotlagh, Cleofe Palocci, Vincenzo Romano Spica, Ilaria Fratoddi, "Surface modification of TiO₂ nanoparticles with organic molecules and their biological applications", *Journal of Materials Chemistry B*, **2023**, 11, 2334-2366, (**Review Article**), DOI: 10.1039/D2TB02576K.
- 8 Sara Cerra, Tommaso Alberto Salamone, Andrea Bearzotti, **Farid Hajareh Haghghi**, Martina Mercurio, Martina Marsotto, Chiara Battocchio, Raoul Fioravanti, Marco Diociaiuti, Ilaria Fratoddi, "Thiol-functionalized palladium nanoparticles networks: Synthesis, characterization, and room temperature (toxic) vapor detection", *Particle & Particle Systems Characterization*, **2023**, 40, 2200189, DOI: 10.1002/ppsc.202200189.
- 9 Roya Binaymotlagh, Laura Chronopoulou, **Farid Hajareh Haghghi**, Ilaria Fratoddi, Cleofe Palocci, "Peptide-based hydrogels: New materials for biosensing and biomedical applications", *Materials*, **2022**, 15, 5871 (**Review Article**), DOI: 10.3390/ma15175871.
- 10 **Farid Hajareh Haghghi**, Roya Binaymotlagh, Seyede Zohreh Mirahmadi-Zare, Hassan Hadadzadeh, "Aptamer/magnetic nanoparticles decorated with fluorescent gold nanoclusters for selective detection and collection of human promyelocytic leukemia (HL-60) cells from a mixture", *Nanotechnology*, **2019**, 31, 025605, DOI: 10.1088/1361-6528/ab484a.
- 11 Roya Binaymotlagh, **Farid Hajareh Haghghi**, Fatemeh Aboutalebi, Seyede Zohreh Mirahmadi-Zare, Hassan Hadadzadeh, Mohammad-Hossein Nasr-Esfahani, "Selective chemotherapy and imaging of colorectal and breast cancer cells by a modified MUC-1 aptamer conjugated to the poly(ethylene glycol)-dimethacrylate coated Fe₃O₄-AuNCs nanocomposite", *New Journal of Chemistry*, **2019**, 43, 238-248, DOI: 10.1039/C8NJ04236E.
- 12 **Farid Hajareh Haghghi**, Hassan Hadadzadeh, Hossein Farrokhpour, Zahra Amirghofran, Seyede Zohreh Mirahmadi-Zare, "Stabilization of DOPA zwitterions on laser-generated gold nanoparticles: ONIOM computational study of the charge-dependent structural and electronic changes of DOPA adsorbed on the gold nanosurface", *The Journal of Physical Chemistry C*, **2018**, 122, 8680-8692, DOI: 10.1021/acs.jpcc.8b02366.
- 13 **Farid Hajareh Haghghi**, Hassan Hadadzadeh, Hossein Farrokhpour, "Investigation of the in situ generation of oxide-free copper nanoparticles using pulsed-laser ablation of bulk copper in aqueous solutions of DNA bases", *RSC Advances*, **2016**, 6, 109885-109896, DOI: 10.1039/C6RA22038J.
- 14 Roya Binaymotlagh, Hassan Hadadzadeh, Hossein Farrokhpour, **Farid Hajareh Haghghi**, Fatemeh Abyar, Seyede Zohreh Mirahmadi-Zare, "In situ generation of the gold nanoparticles-bovine serum albumin (AuNPs-BSA) bioconjugated system using pulsed-laser ablation (PLA)", *Materials Chemistry and Physics*, **2016**, 177, 360-370, DOI: 10.1016/j.matchemphys.2016.04.040.

- 15 **Farid Hajareh Haghighi**, Hassan Hadadzadeh, Hossein Farrokhpour, Nafiseh Serri, Khatereh Abdi, Hadi Amiri Rudbari, "Computational and experimental study on the electrocatalytic reduction of CO₂ to CO by a new mononuclear ruthenium(II) complex", *Dalton Transactions*, **2014**, 43, 11317-11332, DOI: 10.1039/C4DT00932K.
- 16 **Farid Hajareh Haghighi**, Hassan Hadadzadeh, Farivash Darabi, Zahra Jannesari, Malihe Ebrahimi, Taghi Khayamian, Mona Salimi, Hadi Amiri Rudbari, "Polypyridyl Ni(II) complex, [Ni(tppz)₂]²⁺; Structure, DNA and BSA binding and molecular modeling", *Polyhedron*, **2013**, 65, 16-30, DOI: 10.1016/j.poly.2013.08.013.
- 17 **Farid Hajareh Haghighi**, Hassan Hadadzadeh, Farivash Darabi, Hossein Farrokhpour, Marzieh Daryanavard, Hadi Amiri Rudbari, "Bis- and tris(2,3-dihydro-4a,12b-(epoxyethanoxy)[1,4]dioxino[2,3-f] [1,10]phenanthroline) complexes of Ru(II): Synthesis, structure and DNA binding properties", *Journal of Molecular Structure*, **2013**, 1040, 98-111, DOI: 10.1016/j.molstruc.2013.02.039.

Patents

- 2022 Mohammadreza Sharbaf, **Farid Hajareh Haghighi**, Davood Mostofinejad, "A new hyperbranched-polycarboxylate superplasticizer and its preparation" International Application No. PCT/IB2021/051049, International classification (IPC): C04B 103/32 2006.1
- 2019 Mohammadreza Sharbaf, **Farid Hajareh Haghighi**, Davood Mostofinejad, "Production of modified lignosulfonate-based cement plasticizer from black liquor with high flowability and slump retention ability", Iran, Serial No.: A/92 002831, International classification (IPC): C08H 8/00
- 2019 Mohammadreza Sharbaf, **Farid Hajareh Haghighi**, Davood Mostofinejad, "Production of high-initial-flow and high-slump-retention polycarboxylate-based cement plasticizer", Iran, Serial No.: A/89 006767, International classification (IPC): C04B 24/02; C04B 24/02
- 2019 Roya Binaymottagh, **Farid Hajareh Haghighi**, "A process to increase the production efficiency of green chromium oxide from chromite ore". Iran, Serial No.: 92/A 002146, International classification (IPC): C01G 37/00; C25D 11/38; C22B 34/32; C01G 37/14
- 2018 Roya Binaymottagh, **Farid Hajareh Haghighi**, Seyede Zohreh Mirahmadi-Zare, "Fluorescence emitting superparamagnetic aptamer-bound nanocomposite for imaging and specialized treatment of cancer cells". Iran, Serial No.: A/89 018709, International classification (IPC): A61B 5/00; A61K 49/00

International Congresses

- Poster NanoInnovation 2023, Rome, 18-22/09/2023
Farid Hajareh Haghighi, Roya Binaymottagh, Laura Chronopoulou, Sara Cerra, Andrea Giacomo Marrani, Francesco Amato, Cleofe Palocci, Ilaria Fratoddi. Self-assembling peptide-based magnetogels for the removal of heavy metals from water.
- Oral 17th World Congress on Public Health, Rome, 02-06/05/2023
Francesca Ubaldi, Ilaria Fratoddi, Martina Mercurio, **Farid Hajareh Haghighi**, Giusy Lofrano, Sara Cerra, Federica Valeriani, Vincenzo Romano Spica. A new efficient antibacterial nanohybrid obtained by direct conjugation of titania and silver.

- Poster NanInnovation 2022, Rome, 19-23/09/2022
Farid Hajareh Haghighi, Sara Cerra, Tommaso Alberto Salamone, Martina Mercurio, Ilaria Fratoddi. Synthesis and characterizations of highly stable magnetite-silver ($\text{Fe}_3\text{O}_4\text{-Ag}$) nanohybrid for recyclable antibacterial materials.
- Oral YoungInnovation 2022, Rome, 21-23/09/2022
Roya Binaymotlagh, **Farid Hajareh Haghighi**, Laura Chronopoulou, Ilaria Fratoddi, Cleofe Palocci. Synthesis of a novel biocompatible peptide hydrogel impregnated with titanium oxide nanoparticles; investigation of its biological applications.
- Oral YoungInnovation 2022, Rome, 21-23/09/2022
Martina Mercurio, Sara Cerra, Tommaso Alberto Salamone, **Farid Hajareh Haghighi**, Ilaria Fratoddi. Silver nanoparticles as efficient tool in agrifood applications.
- Poster XLVIII Congresso Nazionale di Chimica Inorganica, Pisa, 06-09/09/2022
Sara Cerra, Marco Ranaldi, Tommaso Alberto Salamone, Martina Mercurio, **Farid Hajareh Haghighi**, Simone Amatori, Martina Marsotto, Chiara Battocchio, Roberto Matassa, Stefania Nottola, Francesca Anna Scaramuzza, Souren Grigorian, Ilaria Fratoddi. Network assembly of gold nanoparticles stabilized by rod-like bifunctional Pt-polyynes ligands: From synthesis to electrical properties.
- Poster XLVIII Congresso Nazionale di Chimica Inorganica, Pisa, 06-09/09/2022
Martina Mercurio, Sara Cerra, Tommaso Alberto Salamone, **Farid Hajareh Haghighi**, Sofia Pagliarani, Carmen Morales-Rodriguez, Elena Kuzminsky, Andrea Vannini, Ilaria Fratoddi. Nanotechnology in agriculture: The role of silver nanoparticles in mycorrhization process.
- Oral First Symposium for YouNg Chemists: Innovation and Sustainability, Rome, 20-23/06/2022
Farid Hajareh Haghighi, Martina Mercurio, Sara Cerra, Tommaso Alberto Salamone, Martina Marsotto, Chiara Battocchio, Ilaria Fratoddi. Silane-functionalized metal oxide nanoparticles link silver nanoparticles: A new platform for antibacterial applications.
- Oral First Symposium for YouNg Chemists: Innovation and Sustainability, Rome, 20-23/06/2022
Martina Mercurio, Sara Cerra, Tommaso Alberto Salamone, **Farid Hajareh Haghighi**, Ilaria Fratoddi. Silver nanoparticles as stimulating agents for arbuscular mycorrhizal fungi growth: A new perspective for agrifood.
- Poster First Symposium for YouNg Chemists: Innovation and Sustainability, Rome, 20-23/06/2022
Francesca Ilaria Placitelli, **Farid Hajareh Haghighi**, Martina Mercurio, Ilaria Fratoddi. Loading of phototherapeutic drug 5-aminolevulinic acid on TiO_2 nanoparticles: A new approach for potential dual phototherapeutic effects.
- Poster Novel frontiers in nanocarriers preparation and characterization, Rome, 07/06/2022
Farid Hajareh Haghighi, Martina Mercurio, Sara Cerra, Tommaso Alberto Salamone, Martina Marsotto, Chiara Battocchio, Ilaria Fratoddi. Chemical conjugation of highly stable Ag nanoparticles with silane-functionalized TiO_2 nanoparticles for potential dual antibacterial effect.
- Oral SCI 2021– National Congress of the Italian Chemical Society, Rome, 13-23/09/2021
Farid Hajareh Haghighi, Martina Mercurio, Sara Cerra, Tommaso Alberto Salamone, Ilaria Fratoddi. Silane-functionalized TiO_2 nanoparticles decorated with Ag nanoparticles for dual antimicrobial effects.

- Poster Nanoinnovation, Rome, 21-24/09/2021
Farid Hajareh Haghghi, Martina Mercurio, Sara Cerra, Tommaso Alberto Salamone, Martina Marsotto, Chiara Battocchio, Ilaria Fratoddi. In situ conjugation of silver nanoparticles with silane-functionalized TiO₂ nanoparticles for antibacterial applications.
- Oral Nanoinnovation, Rome, 21-24/09/2021
 Sara Cerra, Tommaso Alberto Salamone, **Farid Hajareh Haghghi**, Roberto Matassa, Ana Maria Beltrán, Francesca Anna Scaramuzzo, Martina Marsotto, Chiara Battocchio, Roberto Li Voti, Concetta Sibilia, Andrea Bearzotti, Ilaria Fratoddi. Functionalized gold nanoparticles in colorimetric and chemoresistive sensors: Synthesis, sensing mechanism and interface properties.
- Poster SCI 2021– National Congress of the Italian Chemical Society, Rome, 13-23/09/2021
 Tommaso Alberto Salamone, Lavinia Rutigliano, Sara Cerra, **Farid Hajareh Haghghi**, Marzia Mongillo, Ilaria Fratoddi, Enzo Agostinelli. Functionalised gold nanoparticles loaded with methotrexate for the treatment of neuroblastoma: Synthesis, characterisation, and in vitro study.
- Poster SCI 2021– National Congress of the Italian Chemical Society, Rome, 13-23/09/2021
 Ilaria Fratoddi, Enrico Bodo, Sara Cerra, Tommaso Alberto Salamone, **Farid Hajareh Haghghi**, Marta Bonaconsa, Elena Kuzminsky, Carmen Morales-Rodriguez, Sofia Pagliarani, Michele Bovi, Andrea Vannini. Truffle farming and nanomaterials: A new technology for the optimization of the mycorrhization process and release of "helper" microorganisms.
- Poster SCI 2021– National Congress of the Italian Chemical Society, Rome, 13-23/09/2021
 Sara Cerra, Valentina Dini, Tommaso Alberto Salamone, **Farid Hajareh Haghghi**, Francesca Anna Scaramuzzo, Roberto Matassa, Martina Marsotto, Chiara Battocchio, Antonella Cartoni, Ilaria Fratoddi. Methylmethacrylate-based polymeric nanoparticles as platform for multimodal imaging.

Participations in Funded Projects

- Sapienza University of Rome **2022** Principal investigator of the research project Avvio alla Ricerca entitled "Silane-functionalized TiO₂ nanoparticles link silver nanoparticles: A new platform for antibacterial applications". Project number AR12218168667728.

Honors and Awards

- Sapienza University of Rome **2020** Awarded a fellowship for attaining the degree of "Dottore di Ricerca" in Sapienza University of Rome.
- Isfahan University of Technology **2012** Ranked 1st among all M.Sc. graduates in Inorganic Chemistry, Iran.
- Shiraz University **2009** Admitted to pursuing graduate studies at Shiraz University without entrance examination (only granted to the top 5% students), Iran.
- Shiraz University **2009** Ranked 11th in the 14th student Olympiad (in Chemistry field) in Iran, (among 33 students).
- Shiraz University **2009** Ranked 2nd among all B.Sc. graduates (among 54 students) in Pure Chemistry, Iran.

Bibliometric Indicators

H index 8 (Source: Google Scholar, accessed on 25 total publications)

Total citations 197 (Google Scholar)

Language Skills and Competences

Native language Persian

Other languages English

• Writing very good

• Reading very good

• Listening and Speaking very good

Technical Skills and Competences

Synthesis of hybrid gold nanoclusters/magnetic nanoparticles functionalized by MUC-1 aptamer for MCF-7 cancer cell imaging and specific drug delivery (1 patent).

Synthesis of magnetic/gold nanoparticles for detection and collection of HL-60 cancer cells.

Synthesis and characterization of Fe₃O₄ and TiO₂ nano hybrids for antibacterial applications.

Extraction of lignosulfonates from paper industry waste for use as concrete plasticizer and synthesis of polycarboxylate superplasticizers for concrete technology (Arisa Construction Chemicals Co.) (3 patents).

Work Experience

• Date 07-23-2018 to 11-21-2020

• Name of company Arisa Construction Chemicals

• Responsibility R&D manager on the most up-to-date and high-quality polycarboxylates, as concrete superplasticizers. Also, production of lignosulfonate-based concrete plasticizer, as the first manufacturer in Iran by using research findings; Write 1 international and 2 national patents on these polycarboxylate and lignosulfonate.

• Address No. 217, Aboureihan Birouni Bldg., Isfahan Science and Technology Town, Isfahan Province, Isfahan/Khomeyni Shahr, Iran.

Date: 21 November 2023