

Farbod Tabesh, Ph.D.

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Education

Ph.D., Isfahan University of Technology **2014-2019**

Organic-Polymer Chemistry

Supervisors: Prof. Dr. Shadpour Mallakpour (mallak777@yahoo.com, mallak@iut.ac.ir) and Dr. Amir Abdolmaleki (abdolmaleki@iut.ac.ir)

Dissertation: Preparation and characterization of hydrogel nanocomposites based on tragacanth gum, pure, and EDTA-modified CaCO₃ NPs: Application in the removal of methylene blue dye and Pb²⁺

GPA: 3.69

M.Sc., Karaj Azad University **2012-2014**

Organic Chemistry

Supervisor: Dr. Gholam Bagheri Marandi (marandi@kia.ac.ir)

Thesis: Synthesis and study on properties of the hydrogel Nanocomposite based on acrylamide-itaconic acid comonomers synthesized in the presence of functionalized and unfunctionalized carbon nanotubes using ultrasound waves

B.Sc., Karaj Azad University **2008-2012**

Applied Chemistry

Teaching Experience

Lecture Courses

- *General Chemistry with Lab, Carrington College San Jose* *2022-Present*
- *Organic Chemistry with lab, Carrington College San Jose* *2022-Present*

Outreach Activities

- *Organic Chemistry, Isfahan University of Technology* *Spring 2019*

Tutoring

- *General Chemistry* *2010-Present*
- *Organic Chemistry I, II, and III* *2012-Present*
- *Polymer Chemistry* *2010-Present*
- *Identification of Organic Compounds* *2010-Present*
- *Introduction to Spectroscopy* *2010-Present*
- *Organic Synthesis* *2013-Present*

Mentoring

- *Defined projects for 5 Master's students, Isfahan University of Technology* *2016-2019*
- *Advised, trained, and overseen 3 Ph.D. Candidates, Isfahan University of Technology* *2016-2019*
- *Mentored 3 undergraduate students, Stanford University School of Medicine (Canary Center)* *2022-Present*

Research Experience

Postdoctoral Researcher, Stanford University School of Medicine **2022-Present**

- *Synthesizing polymeric nanocomposites [containing chitosan, poly(ethylene imine), gold nanostar, β -cyclodextrin, A6 peptide, and NLS peptides] as biocompatible gene carrier for targeted therapeutic gene delivery to treat cancer.*
- *Cancer immune checkpoint therapy and ultrasound molecular imaging using microbubbles.*
- *miRNA delivery using microbubbles to treat and cure liver cancer in dogs.*
- *Preparation of RNA-based COVID vaccine from biocompatible polymers.*
- *Preparation of biocompatible gene carriers.*

Ph.D. Candidate**2014-2019**

- *Synthesizing natural nanocomposite hydrogels from tragacanth gum to remove water pollutants such as heavy metal ions.*
- *Synthesizing natural nanocomposite hydrogels from tragacanth gum to remove water pollutants such as dyes.*
- *Green Chemistry*

M.Sc. Student**2012-2014**

- *Radical polymerization of synthetic and biocompatible hydrogels (from acrylamide and carbon nanotubes) to remove water pollutants like dyes.*

B.Sc. Student**2019-2012**

- *Preparation of organometallic compounds (like SnCl₂) and loading antibiotic drugs (like ciprofloxacin) on them as anti-cancer drugs*

Publications**Research papers**

1. **F. Tabesh**, R. Paulmurugan, Synthesis, characterization, and in vitro application of a biocompatible gene nanocarrier made up of chitosan and poly(ethylene imine) conjugated gold nanostars (in preparation).
2. **F. Tabesh**, A. Natarajan, R. Paulmurugan, A. El Kaffas, Contrast-Enhanced Ultrasound Molecular Imaging of Tumor-Specific Vascular PD-L1 as a Predictive Marker for Cancer Immunotherapy (in preparation).
3. **F. Tabesh**, S. Mehta, T.F. Massoud, R. Paulmurugan, Targeted delivery of TK-p53-NTR to TNBC using gold nanocomposite (in preparation).
4. A. DeJong*, **F. Tabesh***, R. Paulmurugan, PEI-Chitosan Co-polymer as a Novel Delivery System for Gene-Directed Enzyme Prodrug Therapy for Triple Negative Breast Cancer (in preparation).
5. G. Haghverdi*, **F. Tabesh***, R. Paulmurugan, Therapeutic suicide gene delivery by chitosan/poly(ethylene imine) co-polymer for treatment of triple-negative breast cancer: In vitro and in vivo aspects (in preparation).
6. N. Sadeghipour*, **F. Tabesh***, A. Natarajan, A. Lutz, R. Paulmurugan, A. El Kaffas, 2023, Imaging Endothelial Energy: Molecular Ultrasound Characterization of PD-L1 Expression on Cancer Endothelial Cells (submitted).
7. **F. Tabesh**, S. Mallakpour, 2024, Removal of the environmental pollutant methylene blue using bio-nanohydrogel nanocomposite containing tragacanth gum and vitamin C-functionalized carbon nanotube, *Polym Bull.* 81, 1513-1527, <https://doi.org/10.1007/s00289-023-04781-x>.
8. R. Bam, A. Natarajan, **F. Tabesh**, R. Paulmurugan, and J.J. Dahl, 2023. Synthesis and Evaluation of Clinically Translatable Targeted Microbubbles Using a Microfluidic Device for In Vivo Ultrasound Molecular Imaging, *Int J Mol Sci.* 24(10), 9048; <https://doi.org/10.3390/ijms24109048>.
9. S. Mallakpour, **F. Tabesh**, 2021, Effective adsorption of methylene blue dye from water solution using renewable natural hydrogel bionanocomposite based on tragacanth gum: Linear-nonlinear calculations. *Int J Biol Macromol.* 187, 319-324 (<https://doi.org/10.1016/j.ijbiomac.2021.07.105>)
10. S. Mallakpour, **F. Tabesh**, 2021. Renewable bionanohydrogels based on tragacanth gum for the adsorption of Pb²⁺: Study of isotherm, kinetic models, and phenomenology. *Environ Technol Innov.* 23, 101723 (<https://doi.org/10.1016/j.eti.2021.101723>).
11. S. Mallakpour, **F. Tabesh**, 2021. Green and plant-based adsorbent from tragacanth gum and carboxyl-functionalized carbon nanotube hydrogel bionanocomposite for the super removal of methylene blue dye. *Int J Biol Macromol.* 166, 722-729 (<https://doi.org/10.1016/j.ijbiomac.2020.10.229>).
12. S. Mallakpour, **F. Tabesh**, 2019. Tragacanth gum based hydrogel nanocomposites for the adsorption of methylene blue: Comparison of linear and non-linear forms of different adsorption isotherm and kinetics models. *Int J Biol Macromol.* 133, 754-766 (<https://doi.org/10.1016/j.ijbiomac.2019.04.129>).
13. S. Mallakpour, A. Abdolmaleki, **F. Tabesh**, 2018. Ultrasonic-assisted manufacturing of new hydrogel nanocomposite biosorbent containing calcium carbonate nanoparticles and tragacanth gum for removal of heavy metal. *Ultrason Sonochem.* 41, 572-581 (<https://doi.org/10.1016/j.ultsonch.2017.10.022>).

Review articles

1. **F. Tabesh**, S. Mallakpour, and C.H. Hussain, 2023. Recent advances in magnetic semiconductor ZnFe₂O₄ nanoceramics: History, properties, synthesis, characterization, and applications, *J Solid State Chem.* 322, 123940 (<https://doi.org/10.1016/j.jssc.2023.123940>).
2. S. Mallakpour, **F. Tabesh**, and C.H. Hussain, 2022. A new trend of using poly(vinyl alcohol) in 3D and 4D printing technologies: Process and applications. *Adv Colloid Interface Sci.* 301, 102605 (<https://doi.org/10.1016/j.cis.2022.102605>).
3. S. Mallakpour, **F. Tabesh**, and C.H. Hussain, 2021. 3D and 4D printing: From innovation to evolution. *Adv Colloid Interface Sci.* 294, 102482 (<https://doi.org/10.1016/j.cis.2021.102482>).
4. S. Mallakpour, **F. Tabesh**, and C.H. Hussain, 2023. Potential of tragacanth gum in the industries: a short journey from past to the future. *Polym Bull.* 80, 4643-4662 (<https://doi.org/10.1007/s00289-022-04284-1>).
5. S. Mallakpour, **F. Tabesh**, and C.H. Hussain, 2023. Water decontamination using CaCO₃ nanostructure and its nanocomposites: current advances. *Polym Bull.* 80, pages7201–7219 (<https://doi.org/10.1007/s00289-022-04431-8>).

Book chapters

1. S. Mallakpour, **F. Tabesh**, 2021, Microwave-assisted synthesis of chiral polymeric materials: Properties and applications, *Elsevier* (<https://doi.org/10.1016/B978-0-12-819848-3.00017-7>).
2. S. Mallakpour, **F. Tabesh**, 2020, Fabrication Technologies of Layered Double Hydroxide Polymer Nanocomposites, *Elsevier* (<https://doi.org/10.1016/B978-0-08-101903-0.00003-9>).
3. S. Mallakpour, **F. Tabesh**, Application of gum polysaccharides nanocomposites in the removal of industrial organic and inorganic pollutants, *Elsevier* (<https://doi.org/10.1016/B978-0-12-821497-8.00018-6>).
4. S. Mallakpour, V. Behranvand, **F. Tabesh**, Natural polymer-based organic-inorganic hybrid nanosorbents, *Elsevier* (<https://doi.org/10.1016/B978-0-12-820541-9.00005-3>).
5. S. Mallakpour, **F. Tabesh**, Metal oxides and biopolymer/metal oxides bionanocomposites as green nanomaterials for heavy metals removal, *Springer* (https://link.springer.com/chapter/10.1007/978-3-030-69492-0_3).
6. S. Mallakpour, **F. Tabesh**, C.H. Hussain, Entering a new era in pharmaceuticals through 3D/4D printing technologies, *Elsevier*. (sent to the editors)

Grants & Fellowships

- NIH T32 – Stanford Cancer Imaging Training (SCIT) Program 2024-2026

Research Area

Gene delivery, natural hydrogel bionanocomposites, natural polymers, synthetic polymers, adsorbents, water remediation, nanomaterials, nanotechnology, green synthesis of nanoparticles, magnetic nanoparticles, green chemistry, ultrasound imaging, microbubble preparation, cancer diagnosis and treatment, and COVID-19 vaccine

Presentations & Conferences

Oral

1. 29th European symposium on Ultrasound Contrast Imaging, Jan 2024, Rotterdam: Ultrasound Molecular Imaging of Endothelial PD-L1 to Guide Immune Checkpoint Therapy.
2. 13th International Seminar on Polymer Science and Technology, Nov 2018, Tehran: Preparation, characterization, and application of bio-based hydrogel nanocomposite in water treatment.
3. Chemical and Physical Aspects of Self-Healing Materials, IUT, Iran, 2016.
4. Carbon Nanotube, KIAU, Iran, 2013

Poster

1. UltraCon, Apr 2024, Austin: Assessment of Contrast and Molecular Ultrasound Parameters to Predict Response to anti-PD-L1 Immune Checkpoint Inhibitor Mahsa Bataghva, Farbod Tabesh, Arutselvan Natarajan, Ramasamy Paulmurugan, Ahmed Nagy El Kaffas

2. *American Association for Cancer Research Annual Meeting, Apr 2024, San Diego: Imaging Endothelial PD-L1 expression with ultrasound molecular imaging to help to stratify immune checkpoint inhibitor (ICI) response, Arutselvan Natarajan, Farbod Tabesh, Mahsa Bataghva, Ramasamy Paulmurugan, Ahmed El Kaffas.*
3. *29th European symposium on Ultrasound Contrast Imaging, Jan 2024, Rotterdam: Multi-parametric Assessment of Contrast and Molecular Ultrasound to Predict Response to anti-PD-L1 Immune Checkpoint Inhibitor, Mahsa Bataghva, Farbod Tabesh, Arutselvan Natarajan, Ramasamy Paulmurugan, Ahmed Nagy El Kaffas.*
4. *29th European symposium on Ultrasound Contrast Imaging, Jan 2024, Rotterdam: Ultrasound-Stimulated Microbubble Mediated Modulation of Endothelial Immunogenicity, Wei Chen Lo, Farbod Tabesh, Mahsa Bataghva, Arutselvan Natarajan, Ramasamy Paulmurugan, Ahmed El Kaffas.*
5. *World Molecular Imaging Congress 2023, Prague: Targeted Delivery of Therapeutic Genes to Triple-Negative Breast Cancer Cells using a Polymeric Nanocomposite of Gold Nanostars, Farbod Tabesh, Sourabh Mehta, Tarik F Massoud, and Ramasamy Paulmurugan*
6. *Medical Imaging 2023: Ultrasonic Imaging and Tomography, Quantitative methods for molecular ultrasound imaging, Negar Sadeghipour, Farbod Tabesh, Arutselvan Natarajan, Meredith A. Jones, Xuxin Chen, Ramasamy Paulmurugan, Bin Zheng, Ahmed El Kaffas*
7. *A. Natarajan, F. Tabesh, D. Hyun, R. Paulmurugan, and JJ. Dahl, 2023. Abstract LB115: Simultaneous whole-body ultrasound contrast imaging: a novel high throughput preclinical platform for targeted molecular imaging studies. Cancer Res. 83, LB115-LB115.*
8. *JJ. Dahl, R. Bam, D. Hyun, A. Natarajan, F. Tabesh, and R. Paulmurugan, 2023. Toward the clinical application of ultrasound molecular imaging in the early detection of breast cancer. J Acoust Soc Am. 153, A138-A138.*
9. *26th Iranian Seminar of Organic Chemistry (ISOC 2019), Purgation of the Environment Using Natural Materials from the Nature: Study of the Recent Development in Isotherms, Kinetics, And Thermodynamics of the Adsorption, UOZ, Zabol, Iran, 2019.*

Skills

Bench work

Organic chemistry synthesis, polymer synthesis and conjugation, cell culturing, PCR, ELISA, Western blotting, gel electrophoresis, peptide conjugation, DNA transformation and isolation, microbubble preparation, immunohistochemistry (IHC), immunotherapy, immune checkpoint imaging and therapy, targeted cancer therapy.

Animal experience

Handling mice, intravenous injection (tail), intraperitoneal injection (belly), intravitreal injection (eye), catheter insertion, microbubble injection, drug injection, breeding

Instruments

NMR, TEM, Mass spectroscopy, HPLC, FT-IR, UV-Vis, AAS, XRD, Raman Spectroscopy, contact angel, Ultrasound (VisualSonics), VevoCQ, GUAVA, Fluorescent microscopes, IVIS

Analyses and Software

FACS analysis. NMR, TEM, SEM, EDX, Mass spectroscopy, HPLC, FT-IR, UV-Vis, AAS, XRD, Raman Spectroscopy, Photoshop, Microsoft office, Chem Office, Endnote, digimizer, X'Pert, MestReC, SPSS, Origin Pro, Igor Pro, FlowJo, Canvas.

References

Prof. S. Mallakpour, Emeritus of Organic Polymer Chemistry at Department of Chemistry, Isfahan University of Technology, 84156-83111, Islamic Republic of Iran. E-mail address: mallak@iut.ac.ir, mallak777@yahoo.com

Prof. R. Paulmurugan, Molecular Imaging Program at Stanford (MIPS), Department of Radiology and Bio-X Program, Canary Center at Stanford, Stanford University School of Medicine, Stanford, CA 94305, USA, paulmur8@stanford.edu

Prof. A. Abdolmaleki, Department of Chemistry, Shiraz University, Islamic Republic of Iran. E-mail address: abdolmaleki@shirazu.ac.ir

Prof. M. Keramati, Professor of medicine and dentistry, 16550 Ventura Blvd. Suite 214. Encino, CA 91436 USA, E-mail address: info@drkeramati.com, Tel.: +1(818) 990-5588

Dr. Nadia Taheri, Dentist, 12903 Victory Blvd, North Hollywood, CA 91606, E-mail address: nadia.ejrai@gmail.com, Tel.: +1(785) 979-8800

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