ALIREZA NADERI SOHI

PhD in Nanobiotechnology

PROFILE

"Born on January 7, 1980, Married, the **1st** ranked PhD candidate in Nanobiotechnology, and the **2nd** ranked in the nation's postgraduate exam in Clinical biochemistry, with sixteen years of experience as the lecturer of Organic chemistry, the first author of the **1st** IRAN's published manuscript on **mRNA vaccine** against SARS-CoV-2 as a proof-of-concept (POC) project."

CONTACT

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HOBBIES

Traveling
Martial arts
Watching world TV series
Studying History
Comic books

EDUCATION

Tarbiat Modares Uni., Tehran, Iran
2009 - 2015
PhD, Nanobiotechnology

Tarbiat Modares Uni., Tehran, Iran
2003 - 2007
MSc, Clinical Biochemistry

Shahid Beheshti Uni., Tehran, Iran
1999 - 2003
BSc, Chemistry

WORK EXPERIENCE

National Institute of Genetic Engineering and Biotechnology (Assistant Professor)
2023-Present

Tehran University (Visiting Professor)
2019-2022
- Teaching Nanomedicine, Biochemical Methods, etc., to PhD students

Celltech Pharmed Company (Nanoparticles Formulation Manager)
2020-2021
- Development of an mRNA-LNP vaccine against SARS-CoV-2

Stem Cell Technology Research Center (Assistant Professor-Manager of Nanotechnology Department)
2015–2020
- Supervision of five MSc and two PhD hypotheses
- Co-supervision of four MSc and four PhD hypotheses

Iran National Council for Development of Stem Cell Sciences and Technologies (Advisor and Referee)
2018–Present
- Question designing for stem cells and regenerative medicine Olympiad
- Reviewing the doctoral dissertations and production plans

ACECR (Lecturer of Chemistry)
2004-2019
- Teaching organic chemistry, spectroscopy, advanced stoichiometry, solution preparation, etc.

SKILLS HIGHLIGHTS

- Development of Lipid Nanoparticles (LNP) for mRNA/siRNA therapeutics
- Fabrication and surface modification of nanoparticles (Liposomes, LNPs, SPIONs, Dendrimers, Chitosan nanoparticles, Polymersomes, etc.) for developing Drug and Gene delivery systems
- 2D & 3D cell culture (iPSCs, mesenchymal stem cells, cancer cells, normal somatic cells)
- Atomic Force Microscopy (AFM) operation
- Bioconjugation
- FTIR, NMR, XPS, DLS, etc., spectra analysis
- Peptide designing
- ELISA (serologic) kits development
- Development of hydrogels and electrospun nanofibers
- Design of Experiment (Response Surface Methodology, RSM)
- Drug combination analysis
- Advanced stoichiometry and complex calculations

SOFTWARE SKILLS

- GraphPad Prism (Data statistical analysis)
- ImageJ (Image processing)
- Omnic
- MestReNova
- JPK data processing
- Nanosurf
- DLS & Zetasizer software (Malvern)
- FlowJo
- Minitab (Design of experiment, RSM)
- SDP
- Molegro Virtual Docker (Molecular Docking)

JOURNALS REVIEWER

Journal of Nanobiotechnology
Scientific Reports
Journal of Drug Targeting
Frontiers in Bioengineering and Biotechnology
Journal of Orthopaedic Surgery and Research
Molecular Neurobiology
Journal of Diabetes & Metabolic Disorders
Molecular and Cellular Biochemistry
Naunyn-Schmiedeberg's Archives of Pharmacology
Polymer Engineering & Science
Journal of Applied Polymer Science
Bioengineered
Journal of Ophthalmic and Vision Research (JOVR)

LANGUAGE

English

Persian

Arabic (Intermediate level in Reading)

RESEARCH INTERESTS

Development of mRNA-based medicines for prophylactic and therapeutic purposes (e.g., vaccines for infectious diseases, cancer, senescence, etc.)

Development of nanocarrier-based chemotherapeutics equipped with targeting moieties

Development of drug delivery systems for CNS targeting with the ability to pass the blood-brain barrier

Development of 3D tumor models using 3D bioprinting for general and personalized drug testing

Development and optimization of nanocarriers for delivery of CRISPR-mediated gene editing components toward Hematopoietic Stem Cells

Non-viral delivery of CAR-encoding mRNAs to T-cells and NK-cells

Designing inhaled peptide mimics against respiratory pathogens

PUBLICATIONS

1. Hosseinzadeh, Samaneh, Alireza Nouhi Kararoudi, Seyed Milad Mousavi Eshkelani, Safura Pakizehkar, Alireza Naderi Sohi, Farhood Najafi, and Najmeh Ranji. **"Inhibition of Cancer Stem Cells Growth with Silibinin Encapsulated in Nanoparticles with Deregulation of miR-34a, miR-221, and miR-222."** *Iran Red Crescent Med J*. **(2023)**. 25(4):e2476

2. Samimi, Hilda, Rezvan Tavakoli, Parviz Fallah, Alireza Naderi Sohi, Maryam Amini Shirkouhi, Mahmood Naderiand Vahid Haghpanah. **"BI-847325, a Selective Dual MEK and Aurora Kinases Inhibitor, Reduces Aggressive Behavior of Anaplastic Thyroid Carcinoma on an in vitro Three-Dimensional Culture"** *Cancer Cell International* **(2022):** 22:388

3. Abedin Dargoush, Shabnam, Hana Hanaee-Ahvaz, Shiva Irani, Masoud Soleimani, Seyedeh Mahsa Khatami, and Alireza Naderi Sohi. **"A composite bilayer scaffold functionalized for osteochondral tissue regeneration in rat animal model."** *Journal of Tissue Engineering and Regenerative Medicine 16, no.* 6 **(2022)**: 559-574

4. Yarahmadi, Hadis Bahrami, Azin Khani, Yasamin Baghdadchi, Mohammad Javadi, Ali Sharafi, Alireza Naderi Sohi, and Hamid Reza Kheiri. **"Study of the biological relevance of Wnt/β-catenin signaling pathway and β-adrenergic regulation in osteoblastic differentiation of mesenchymal stem cells."** *Gene Reports* **(2022)**: 101662.

5. **Naderi Sohi, Alireza**, Jafar Kiani, Ehsan Arefian, Arezou Khosrojerdi, Zahra Fekrirad, Shokoofeh Ghaemi, Mohammad Kazem Zim, Arsalan Jalili, Nazila Bostanshirin, and Masoud Soleimani. **"Development of an mRNA-LNP Vaccine against SARS-CoV-2: Evaluation of Immune Response in Mouse and Rhesus Macaque."** *Vaccines* 9, no. 9 **(2021)**: 1007.

6. Samimi, Hilda, Alireza Naderi Sohi, Shiva Irani, Ehsan Arefian, Mojdeh Mahdiannasser, Parviz Fallah, and Vahid Haghpanah. **"Alginate-based 3D cell culture technique to evaluate the half-maximal inhibitory concentration: an in vitro model of anticancer drug study for anaplastic thyroid carcinoma."** *Thyroid Research* 14, no. 1 **(2021)**: 1-9.

7. Maghsoudnia, Niloufar, Reza B. Eftekhari, Alireza Naderi Sohi, and Farid Abedin Dorkoosh. **"Chloroquine Assisted Delivery of microRNA Mimic Let-7b to NSCLC Cell Line by PAMAM (G5)-HA Nano-Carrier."** *Current Drug Delivery* 18, no. 1 **(2021)**: 31-43.

8. Khalili, Mahsa, Hamid Keshvari, Rana Imani, Alireza Naderi Sohi, Elaheh Esmaeili, and Maryam Tajabadi. **"Study of osteogenic potential of electrospun PCL incorporated by dendrimerized superparamagnetic nanoparticles as a bone tissue engineering scaffold."** *Polymers for Advanced Technologies* 33, no. 3 **(2021)**: 782-794

9. Valibeik, Ali, Negar Naderi, Abdolhakim Amini, Niloufar Tavakoli Dastjerd, Sobhan Rahimi Monfared, Leila Jafaripour, Saeed Veiskarami, Mehdi Birjandi, Alireza Naderi Sohi, and Hassan Ahmadvand. **"Effect of camphor on biochemical factors and gene expression of antioxidant enzymes, inflammatory and apoptotic factors against gentamicin-induced nephrotoxicity in rats."** Journal of Renal Injury Prevention 10, no. 3 **(2020)**: e21-e21.

10. Maghsoudnia, Niloufar, Reza Baradaran Eftekhari, Alireza Naderi Sohi, Parisa Norouzi, Hamid Akbari, Mohammad Hossein Ghahremani, Masoud Soleimani, Mohsen Amini, Hamed Samadi, and Farid Abedin Dorkoosh. **"Mitochondrial delivery of microRNA mimic let-7b to NSCLC cells by PAMAM-based nanoparticles."** *Journal of Drug Targeting* 28, no. 7-8 **(2020)**: 818-830.

11. Haghshenas, Venus, Reyhaneh Sariri, Alireza Naderi Sohi, and Hojjatollah Nazari. **"Encapsulation of Docetaxel into Diblock Polymeric Polymersome as a Nanodrug."** *ChemistrySelect* 5, no. 29 **(2020)**: 8924-8928.

DEVELOPMENT OF COMMERCIAL PRODUCTS

- 3D Bioprinting Bioink (Alginate-RGD) with defined peptide density
- I-Cell™ SARS-CoV-2 Spike RBD Human IgG ELISA Kit (Detection of Neutralizing Antibodies)

12. Maghsoudnia, Niloufar, Reza Baradaran Eftekhari, Alireza Naderi Sohi, Ali Zamzami, and Farid Abedin Dorkoosh. **"Application of nano-based systems for drug delivery and targeting: A review."** *Journal of Nanoparticle Research* 22, no. 8 **(2020)**: 1-41.

13. Khatami, Seyedeh Mahsa, Kazem Parivar, Alireza Naderi Sohi, Masoud Soleimani, and Hana Hanaee-Ahvaz. **"Acetylated hyaluronic acid effectively enhances chondrogenic differentiation of mesenchymal stem cells seeded on electrospun PCL scaffolds."** *Tissue and Cell* 65 **(2020)**: 101363.

14. Abedin Dargoush, Shabnam, Shadie Hatamie, Shiva Irani, Masoud Soliemani, Hana Hanaee-Ahvaz, and Alireza Naderi Sohi. **"Strontium doped nanohydroxy apatite/reduced graphene oxide nanohybrid is speed up osteogenic differentiation of human mesenchymal stem cells."** *Asian Journal of Nanosciences and Materials* 3, no. 3 **(2020)**: 226-237.

15. Hashemi, Naimeh, Zahra Vaezi, Somayeh Khanmohammadi, Alireza Naderi Sohi, Saeed Masoumi, Veronika Hruschka, Susanne Wolbank, Heinz Redl, Darja Marolt Presen, and Hossein Naderi-Manesh. **"A novel fluorescent hydroxyapatite based on iron quantum cluster template to enhance osteogenic differentiation."** *Materials Science and Engineering: C* 111 **(2020)**: 110775.

16. Khatami, Seyedeh Mahsa, Shadie Hatamie, Alireza Naderi Sohi, Kazem Parivar, Masoud Soleimani, and Hana Hanaee-Ahvaz. **"Reduced graphene oxide/nanohydroxy Apatite-Bismuth nanocomposites for osteogenic differentiation of human mesenchymal stem cells."** *Asian Journal of Nanosciences and Materials* 3, no. 4 **(2020)**: 330-339.

17. Abedin Dargoush, Shabnam, Shiva Irani, Alireza Naderi Sohi, Masoud Soleimani, and Hana Hanaee-Ahvaz. **"Chondroinductive impact of polyethersulfone/benzyl hyaluronate nanofibrous scaffold on human mesenchymal stem cells."** *Polymers for Advanced Technologies* 31, no. 11 **(2020)**: 2569-2578.

18. Pakizehkar, Safura, Najmeh Ranji, Alireza Naderi Sohi, and Majid Sadeghizadeh. **"Curcumin loaded PEG400-OA nanoparticles: A suitable system to increase apoptosis, decrease migration, and deregulate miR-125b/miR182 in MDA-MB-231 human breast cancer cells."** *Polymers for Advanced Technologies* 31, no. 8 **(2020)**: 1793-1804.

19. Saleh, Nafiseh Tavakolpoor, Alireza Naderi Sohi, Elaheh Esmaeili, Somayeh Karami, Fatemeh Soleimanifar, and Nikoo Nasoohi. **"Immobilized laminin-derived peptide can enhance expression of stemness markers in mesenchymal stem cells."** *Biotechnology and Bioprocess Engineering* 24, no. 6 **(2019)**: 876-884.

20. Allahverdi, Abdollah, Hossein Naderi-Manesh, Mosslim Sedghi, Alireza Naderi Sohi, and Fatemeh Kouhkan. **"Surface modification in microfluidic platform to miR-21 and miR-486 detection from lung cancer cell."** *Journal of Cellular and Molecular Research (Iranian Journal of Biology)* **(2019)**.

21. Esmaeili, Elaheh, Mahsa Khalili, Alireza Naderi Sohi, Simzar Hosseinzadeh, Behnaz Taheri, and Masoud Soleimani. **"Dendrimer functionalized magnetic nanoparticles as a promising platform for localized hyperthermia and magnetic resonance imaging diagnosis."** Journal of cellular physiology 234, no. 8 **(2019)**: 12615-12624.

22. Pakizehkar, Safura, Najmeh Ranji, Alireza Naderi Sohi, and Majid Sadeghizadeh. **"Polymersome-assisted delivery of curcumin: A suitable approach to decrease cancer stemness markers and regulate miRNAs expression in HT29 colorectal cancer cells."** *Polymers for Advanced Technologies* 31, no. 1 **(2019)**: 160-177.

23. Samimi, Hilda, Vahid Haghpanah, Shiva Irani, Ehsan Arefian, Alireza Naderi Sohi, Parviz Fallah, and Masoud Soleimani. **"Transcript-level regulation of MALAT1-mediated cell cycle and apoptosis genes using dual MEK/Aurora kinase inhibitor "BI-847325" on anaplastic thyroid carcinoma."** *DARU Journal of Pharmaceutical Sciences* 27, no. 1 **(2019)**: 1-7.

TEACHING IN WORKSHOPS

- **Drug and Gene delivery systems.** Webinars in the national biotechnology training courses organized by Iran's Vice-Presidency for Science & Technology (VPST), 2023
- **Nanoparticles-based pulmonary drug delivery and its likely application against SARS-CoV-2 infection**. Webinar for students and researchers, 2020
- Special Teacher in 40 hours **Nanobiotechnology course** in the 1st Advanced Technology School (ATS). Tarbiat Modares University in collaboration with Iran's Vice-Presidency for Science & Technology (VPST), 2015, Tehran, Iran
- **Advanced Stoichiometry and its application in biology, pharmacy, and nanomedicine (Drug & Gene delivery).** Several courses in Stem Cell Technology Research Center (STRC), 2017- 2020, Tehran, Iran
- **(ATR)-FTIR spectra analysis for tissue engineering investigators**. Several courses in Stem Cell Technology Research Center (STRC), 2016- 2019, Tehran, Iran

TEACHING EXPERIENCE

- Nanobiotechnology & Nanomedicine
- Organic Chemistry
- Spectroscopy
- Immunochemistry
- Biochemistry & Biochemical Methods
- Drug & Gene Delivery
- Advanced Stoichiometry and its application in biology, pharmacy, and nanomedicine

24. Hossainzadeh, Samaneh, Najmeh Ranji, Alireza Naderi Sohi, and Farhood Najafi. **"Silibinin encapsulation in polymersome: A promising anticancer nanoparticle for inducing apoptosis and decreasing the expression level of miR-125b/miR-182 in human breast cancer cells."** *Journal of cellular physiology* 234, no. 12 **(2019)**: 22285-22298.

25. Afrang, Negin, Rezvan Tavakoli, Nooshin Tasharrofi, Amir Alian, Alireza Naderi Sohi, Mahboubeh Kabiri, Mehrnoosh Fathi-Roudsari et al. **"A critical role for miR-184 in the fate determination of oligodendrocytes."** *Stem cell research & therapy* 10, no. 1 **(2019)**: 1-11.

26. Sohi, Alireza Naderi, Hossein Naderi-Manesh, Masoud Soleimani, Elaheh Roshani Yasaghi, Hamidreza Kheiri Manjili, Sharareh Tavaddod, and Shahrzad Nojehdehi. **"Synergistic effect of co-immobilized FGF-2 and vitronectin-derived peptide on feeder-free expansion of induced pluripotent stem cells."** *Materials Science and Engineering: C* 93 **(2018)**: 157-169.

27. Sohi, Alireza Naderi, Hossein Naderi-Manesh, Masoud Soleimani, Samaneh Mirzaei, Mohammad Delbari, and Masumeh Dodel. **"Influence of chitosan molecular weight and poly (ethylene oxide): Chitosan proportion on fabrication of chitosan based electrospun nanofibers."** *Polymer Science, Series A* 60, no. 4 **(2018)**: 471-482.

28. Samimi, Hilda, Parviz Fallah, Alireza Naderi Sohi, Rezvan Tavakoli, Mahmood Naderi, Masoud Soleimani, Bagher Larijani, and Vahid Haghpanah. **"Precision medicine approach to anaplastic thyroid cancer: advances in targeted drug therapy based on specific signaling pathways."** *Acta Medica Iranica* **(2017)**: 200-208.

29. Naderi Sohi, Alireza, Hossein Naderi-Manesh and Masoud Sleimani. **"A comparative study on utility of Scanning Electron Microscopy and Atomic Force Microscopy for topological investigation of electrospun nanofibers as the cell culture scaffolds."** *Modares Journal of Biotechnology* 7, no. 2 **(2016)**: 40-50.

30. Naderi Sohi, Alireza, Masoumeh Rajabibazl, Mohammad Javad Rasaee, and Kobra Omidfar**. "The use of camel antibodies in development of EGFRvIII enzyme-linked immunosorbent assay."** *Applied Biochemistry and Microbiology* 51, no. 3 **(2015)**: 374-380.

31. Rajabibazl, Masoumeh, Mohammad Javad Rasaee, Taki Tiraihi, Ali Reza Naderi Sohi, and Shima Hallaj. **"Development of Oral Morphine Rapid Test by Using Yolk Immunoglobulin."** *Journal of Applied Research* 10, no. 3 **(2010)**: 134.

32. Omidfar, Kobra, Zahra Moinfar, Alireza Naderi Sohi, Seyed Mohamad Tavangar, Vahid Haghpanah, Ramin Heshmat, Soheila Kashanian, and Bagher Larijani. **"Expression of EGFRvIII in thyroid carcinoma: immunohistochemical study by camel antibodies."** *Immunological investigations* 38, no. 2 **(2009)**: 165-180.

Google Scholar link

ABSTRACTS (SINCE 2016)

- The 2019 Controlled Release Society Annual Meeting & Exposition, Valencia, **Spain**. Niloufar Maghsoudnia, Alireza Naderi Sohi, Reza Baradaran Eftekhari, Hamid Akbari Javar, Mohammad Hossein Ghahremani, Masoud Soleimani, Farid Abedin Dorkoosh. **Delivery of hsa-let-7b-5p by PAMAM (G5)-TPP nano-conjugates to mitochondria in non-small-cell lung cancer (NSCLC) cells.**
- 7th International conference on nanostructures (ICNS7) 2018, Tehran, **Iran**. Mahsa Khalili, Hamid Keshvari, Alireza Naderi Sohi, Rana Imani, Maryam Tajabadi. **Dendrimer-modified SPIONs for Plasmid DNA Condensation.**
- The 1st National Festival and the International Congress on Stemcells and Regenerative Medicine 2016, Tehran, **Iran**. Alireza Naderi Sohi. Naderi-Manesh, H.; Soleimani, M.;Yasaghi, E. R.;Manjili, H. K.;Tavaddod, S.; Nojehdehi, S. **Feeder-free culture on human pluripotent stem cells on chitosan film.**

BOOKS

- Organic Chemistry (for basic medical and pharmaceutical science students)- in Persian
- Essential principles of Chemistry and Biochemistry for operating room (OR) students- in Persian

ORAL PRESENTATIONS

- **Drug and gene delivery, Dos and Don'ts.** 13th National and 5th International Biotechnology Congress of the Iranian Biotechnology Society, Tehran, Iran. 2023
- **mRNA Vaccine against SARS-CoV-2**. International Roundtable on Covid-19 and Biotechnology, 12th National and 4th International Biotechnology Congress of Iran (Organized by Iranian Biotechnology Society, UNESCO/UNITWIN Network in Biophysics, Biotechnology and Environmental Health, and University Consortium on Covid-19). 2021
- **Nonviral gene delivery systems: charming tools for h-index upgrade or a promising approach?** 6th Genetics and Stem-Cells Symposium, Trending to Gene Therapy Approach, Iran. 2021
- **Utility of camel subclass antibodies in EGFRvIII enzyme-linked immunosorbent assay.** 9th National Congress of Biochemistry & 2nd International Congress of Biochemistry and Molecular Biology, Shiraz, Iran. 2007

AWARDS

- Winner of the title of "**The best lecturer**" in the training course of the Biotechnology Development Headquarters, Iran's Vice-Presidency for Science & Technology (VPST), 2023

REFERENCES

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