

Matin Mahmoudifard

Gender: Female Nationality: Iranian Date of Birth: 04/11/1987

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Google scholar: <https://scholar.google.com/citations?user=oIuRsm8AAAAJ&hl=fa>



Professional Summery

I am developing novel nanomaterials for the biomedical applications like tissue engineering, cancer diagnosis, drug delivery systems, antimicrobial and wound dressing applications.

Current Position

- 2018-Current
- Assistant professor at National Institute for Genetic Engineering and Biotechnology (NIGEB), Tehran, Iran,
 - Head of Environment, Energy and Nano-biotechnology department

Education

PhD Nanoscience and Nanotechnology, Tehran, Iran. Sharif University of Technology, Institute for Nano Science and Nanotechnology.

(2012-2017)

Thesis: Designing and fabrication of microfluidic biosensors based on the nanofibrous membranes for biomarkers detection

GPA:18:34 from 20

Supervisors: Professor Manouchehr Vossoughi (Sharif university of technology), Professor Masoud Soleimani (Department of Hematology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran), Professor Sara Soudi (Department of Immunology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran).

M. Sc
(2010-2012)

Nanofiberous Structures Engineering, Tehran, Iran. Amirkabir University of Technology.

Thesis: Production and characterization of quantum dot /PVA nanofibers composite with the ability of using as optical sensor for volatile organic compounds (VOCs).

GPA: 18.77 from 20

Supervisors: Professor A. Mousavi Shoushtari, A. Mohsenifar

Honors

- As top ten faculty at National institute for genetic engineering and biotechnology (2020&2021&2022)
- Entrance in the Ph.D. period as an elite student and without entrance exam
- Education prize winner of elite National foundation (2015)
- Education prize winner of elite National foundation (2016)
- Second-ranked among all the bachelor students.
- Second-ranked among all the master students.
- First- ranked among all the Ph.D student Research

Interests

- Nanobiotechnology
- Tissue engineering
- Nanoparticles synthesis (lipid, polymeric and inorganic based nanoparticle synthesis)
- Drug delivery
- Biotechnology and biomaterials
- Biosensors
- Electrospinning
- Microfluidic devices
- Wound healing
- ELISA based immunoassay
- Nanostructured sensors
- Graphene and quantum dot-based nanostructures
- Applications of the nanofibrous membranes
- Optical properties of nanostructures
- Instrumental and analytical methods for the study of the nanostructures and nanoparticles
- Nanocomposite development for antimicrobial and wound dressing applications
- Enzyme immobilization on different kind of nanostructures

List of publications (Dr. Matin Mahmoudifard)

A. Publications with peer review process

* Star shows corresponding author

1. Manijeh Avatefi, **Matin Mahmoudifard***, Negin Borzooee Moghadam, (2023)
Amine functionalized graphene quantum dots- hyaluronic acid nanocomposite as

- an efficient cancer cell bioimaging and biosensing system, *Applied physic A*, 2023, accepted.
2. Fariba Mohebichamkhorami, Mehrdad Faizi, **Matin Mahmoudifard**, Arman Hajikarim-Hamedani, Seyedeh Sarvenaz Mohseni, Amirhossein Heidari, Yekta Ghane, Mona Khoramjouy, Maryam Khayati, Rasoul Ghasemi, Hakimeh Zali, Simzar Hosseinzadeh, Ebrahim Mostafavi, (2023) *Microfluidic Synthesis of Ultrasmall Chitosan/Graphene Quantum Dots Particles for Intranasal Delivery in Alzheimer's Disease Treatment*, *Small*, Research Article, No. smll.202207626R2), accepted.
 3. Maria Valadbeigi, Sedigheh Merabian, **Matin Mahmoudifard***, (2023) *Study on the antibacterial effect of CuO nanoparticles on Klebsiella pneumonia bacteria: efficient treatment for colorectal cancer*, *Biotechnology and applied biochemistry*, 2023, accepted,
 4. Negin Borzooee Moghadam, Manizheh Avatefi, Mahnaz Karimi, **Matin Mahmoudifard***, (2023). Graphene family in cancer therapy: recent progress in cancer gene/drug delivery applications. *Journal of Materials chemistry. B*.
 5. Asghari, S., & **Mahmoudifard, M***. (2023). The detection of the captured circulating tumor cells on the core- shell nanofibrous membrane using hyaluronic acid- functionalized graphene quantum dots. *Journal of Biomedical Materials Research Part B: Applied Biomaterials*, 111(5), 1121-1132.
 6. Barati, F., Avatefi, M., Moghadam, N. B., Asghari, S., Ekrami, E., & **Mahmoudifard, M.*** (2023). A review of graphene quantum dots and their potential biomedical applications. *Journal of Biomaterials Applications*, 37(7), 1137-1158.
 7. Mohebichamkhorami, F., Niknam, Z., Khoramjouy, M., Heidarli, E., Ghasemi, R., Hosseinzadeh, **Mahmoudifard, M.** & Faizi, M. (2022). Brain Homogenate of Rat Model of Alzheimer'Disease Modifies Secretome of 3D Cultured Periodontal Ligament Stem Cells; A Potential Neuroregenerative Therapy. *Iranian Journal of Pharmaceutical Research*, 21(1).
 8. Ekrami, E., Pouresmaieli, M., sadat Hashemiyoon, E., Noorbakhsh, N., & **Mahmoudifard, M.*** (2022). Nanotechnology: a sustainable solution for heavy metals remediation. *Environmental Nanotechnology, Monitoring & Management*, 18, 100718.
 9. Pouresmaieli, M., Ataei, M., Forouzandeh, P., Azizollahi, P., & **Mahmoudifard, M.*** (2022). Recent progress on sustainable phytoremediation of heavy metals from soil. *Journal of Environmental Chemical Engineering*, 108482.
 10. Asghari, S., Ekrami, E., Barati, F., Avatefi, M., & **Mahmoudifard, M.*** (2022). The role of the nanofibers in lateral flow assays enhancement: a critical review. *International Journal of Polymeric Materials and Polymeric Biomaterials*, 1-14.
 11. Vahedi, N., Tabandeh, F., & **Mahmoudifard, M.*** (2022). Hyaluronic acid–graphene quantum dot nanocomposite: Potential target drug delivery and cancer cell imaging. *Biotechnology and Applied Biochemistry*, 69(3), 1068-1079.

12. Pouresmaieli, M., Ekrami, E., Akbari, A., Noorbakhsh, N., Moghadam, N. B., & **Mamoudifard, M.** * (2021). A comprehensive review on efficient approaches for combating coronaviruses. *Biomedicine & Pharmacotherapy*, 144, 112353.
13. Asghari, S., Barati, F., Avatefi, M., & **Mahmoudifard, M.** * (2021). Nanostructure Materials: Efficient Strategies for Circulating Tumor Cells Capture, Release, and Detection. *Biotechnology and Bioprocess Engineering*, 26, 529-545.
14. Ekrami, E., Pouresmaieli, M., Shariati, P., & **Mahmoudifard, M.** * (2021). A review on designing biosensors for the detection of trace metals. *Applied Geochemistry*, 127, 104902.
15. Asghari, S., & **Mahmoudifard, M.** * (2021). Core- shell nanofibrous membrane of polycaprolactone- hyaluronic acid as a promising platform for the efficient capture and release of circulating tumor cells. *Polymers for Advanced Technologies*, 32(3), 1101-1113.
16. Barati, F., Pouresmaieli, M., Ekrami, E., Asghari, S., Ziarani, F. R., & **Mamoudifard, M.***. (2020). Potential drugs and remedies for the treatment of COVID-19: a critical review. *Biological Procedures Online*, 22(1), 1-17.
17. Barati, F., Farsani, A. M., & **Mahmoudifard, M.** * (2020). A promising approach toward efficient isolation of the exosomes by core-shell PCL-gelatin electrospun nanofibers. *Bioprocess and biosystems engineering*, 43, 1961-1971.
18. Barati, F., Arpanaei, A., & **Mahmoudifard, M.** * (2020). Highly efficient detection of cancer-derived exosomes using modified core-shell electrospun nanofibers as a capture substrate and antibody immobilized-graphene quantum dots as a signaling agent. *Analytical Methods*, 12(28), 3670-3681.
19. Asghari, S., Rezaei, Z., & **Mahmoudifard, M.** * (2020). Electrospun nanofibers: A promising horizon toward the detection and treatment of cancer. *Analyst*, 145(8), 2854-2872.
20. **Mahmoudifard, M.**, & Vossoughi, M. (2019). Different PES nanofibrous membrane parameters effect on the efficacy of immunoassay performance. *Polymers for Advanced Technologies*, 30(8), 1968-1977.
21. Rezaei, Z., & **Mahmoudifard, M.** * (2019). Pivotal role of electrospun nanofibers in microfluidic diagnostic systems—a review. *Journal of Materials Chemistry B*, 7(30), 4602-4619.
22. **Mahmoudifard, M.**, Vossoughi, M., Soudi, S., & Soleimani, M. (2018). Electrospun polyethersulfone nanofibrous membrane as novel platform for protein immobilization in microfluidic systems. *Journal of Biomedical Materials Research Part B: Applied Biomaterials*, 106(3), 1108-1120.
23. **Mahmoudifard, M.**, Vossoughi, M., Soudi, S., & Soleimani, M. (2018). Electrospun polyethersulfone nanofibrous membrane as novel platform for protein immobilization in microfluidic systems. *Journal of Biomedical Materials Research Part B: Applied Biomaterials*, 106(3), 1108-1120.
24. Ranjbarvan, P., **Mahmoudifard, M.**, Kehtari, M., Babaie, A., Hamed, S., Mirzaei, S., & Hosseinzadeh, S. (2018). Natural compounds for skin tissue engineering by electrospinning of nylon-Beta vulgaris. *ASAIO journal*, 64(2), 261-269.

25. Zamanlui, S., **Mahmoudifard, M.**, Soleimani, M., Bakhshandeh, B., Vasei, M., & Faghihi, S. (2018). Enhanced chondrogenic differentiation of human bone marrow mesenchymal stem cells on PCL/PLGA electrospun with different alignments and compositions. *International Journal of Polymeric Materials and Polymeric Biomaterials*, 67(1), 50-60.
26. **Mahmoudifard, M.**, Soleimani, M., & Vossoughi, M. (2017). Ammonia plasma-treated electrospun polyacrylonitrile nanofibrous membrane: the robust substrate for protein immobilization through glutaraldehyde coupling chemistry for biosensor application. *Scientific Reports*, 7(1), 1-14.
27. Hosseinzadeh, S., Soleimani, M., Vossoughi, M., Ranjbarvan, P., Hamed, S., Zamanlui, S., & **Mahmoudifard, M.** * (2017). Study of epithelial differentiation and protein expression of keratinocyte-mesenchyme stem cell co-cultivation on electrospun nylon/B. vulgaris extract composite scaffold. *Materials Science and Engineering: C*, 75, 653-662.
28. Esmaeili, E., Soleimani, M., Shamloo, A., **Mahmoudifard, M.**, & Vossoughi, M. (2016). Dual improvement of DNA-directed antibody immobilization utilizing magnetic fishing and a polyamine coated surface. *RSC advances*, 6(112), 111210-111216.
29. Hosseinzadeh, S., Rezayat, S. M., Vashegani-Farahani, E., **Mahmoudifard, M.**, Zamanlui, S., & Soleimani, M. (2016). Nanofibrous hydrogel with stable electrical conductivity for biological applications. *Polymer*, 97, 205-216.
30. Hosseinzadeh, S., **Mahmoudifard, M.**, Mohamadyar-Toupkanlou, F., Dodel, M., Hajarizadeh, A., Adabi, M., & Soleimani, M. (2016). The nanofibrous PAN-PANI scaffold as an efficient substrate for skeletal muscle differentiation using satellite cells. *Bioprocess and biosystems engineering*, 39, 1163-1172.
31. **Mahmoudifard, M.**, Soleimani, M., Hatamie, S., Zamanlui, S., Ranjbarvan, P., Vossoughi, M., & Hosseinzadeh, S. (2016). The different fate of satellite cells on conductive composite electrospun nanofibers with graphene and graphene oxide nanosheets. *Biomedical Materials*, 11(2), 025006.
32. **Mahmoudifard, M.**, Soudi, S., Soleimani, M., Hosseinzadeh, S., Esmaeili, E., & Vossoughi, M. (2016). Efficient protein immobilization on polyethersulfone electrospun nanofibrous membrane via covalent binding for biosensing applications. *Materials Science and Engineering: C*, 58, 586-594.
33. **Mahmoudifard, M.**, Shoushtari, A. M., & Shanehsaz, M. (2014). Quantum dot/polyvinyl alcohol composite nanofibers membrane as highly sensitive fluorescence quenching-based sensors. *Fibers and Polymers*, 15, 1797-1803.
34. Rahmani, S., **Mahmoudifard, M.**, & Safi, M. (2014). Protecting surfaces using one-dimensional nanostructures. *International Journal of Nanoscience and Nanotechnology*, 10(1), 61-66.
35. **Mahmoudifard, M.**, Shoushtari, A. M., & Mohsenifar, A. (2012). Fabrication and characterization study of electrospun quantum dot—poly vinyl alcohol composite nanofiber for novel engineering applications. *Fibers and Polymers*, 13, 1031-1036.

36. **Mahmoudifard, M.**, & Safi, M. (2012). Novel study of carbon nanotubes as UV absorbers for the modification of cotton fabric. *Journal of the Textile Institute*, 103(8), 893-899.
37. **Mahmoudifard, M.**, Shoushtari, A., & Mohsenifar, A. Novel approach toward optical sensors based on electrospun nanofibers â quantum dot composites. *Textile Industry*. 2011; 6: 300-303.

B. Submitted publications with peer review process

1. Manijeh Avatefi, Sahar Asghari, **Matin Mahmoudifard***, Novel GO-CuI nanocomposite as a novel and efficient antibacterial reagent, **Inorganic Chemistry Communications**, 2023, Submitted.
2. Sepideh Razani, Manijeh Avatefi, **Matin Mahmoudifard***, PVA/Chitosan electrospun nanofibrous membrane containing Sambucus nigra extract as an efficient antibacterial and wound healing substrate, *International journal of pharmaceutics*, Submitted.
3. Negin Borzoe Moghadam, Manijeh Avatefi, **Matin Mahmoudifard***, PCL//Gelatin electrospun nanofibrous membrane decorated with polydopamine and graphene quantum dot: novel candidate for neural tissue engineering, *Materials science and engineering C*. Submitted.
4. Manizheh Avatefi, Sahar Asghari, **Matin Mahmoudifard***, Electrospun nanofiber of cellulose acetate modified with polydopamine and graphene/ copper iodide as antiviral. Antibacterial and wound healing substrate, *Material chemistry B*. Submitted.

The following above mentioned publications have evolved from my doctoral dissertation: A20, A21, A22, A23, A26, A28, A32

C. Patents

- **Exosome Isolation by Thermosensitive Nanofiber**, US Patent App. 17/206,567
- **Fabrication of polymeric composite nanofiber containing quantum dot's for using in acute electro-optical devises**, patent number 73017, Iran's Patent Office, 2011.
- **Fabrication of highly sensitive optical VOC's sensors based on nanofiber and quantum dot's**, patent number 73005, Iran's Patent Office, 2011.

D. Scientific communication

- 1- Matin Mahmoudifard, Manuchehr vosoughi, Masoud Soleimani, 6th International conference on advanced Nanomaterials, Efficient protein immobilization on electrospun nanofibrous membrane via covalent binding for biosensing applications, ANM2015, Oral, Portugal.
- 2- **Matin Mahmoudifard**, Ahmad Mousavi Shoushtari, Afshin Mohsenifar, Novel approach toward optical sensors based on electrospun nanofibers- quantum dot composites, Tex Teh, June 23, 2011, Oral, Bucharest- Romania.
- 3- **Matin Mahmoudifard**, Ahmad Mousavi Shoushtari, Afshin Mohsenifar, Fabrication and

- characterization study of electrospun quantum dot- Poly vinyl alcohol composite nanofiber, 4th international congress on nanoscience and nanotechnology- ICNN 2012, Oral, University of Kashan- Iran.
- 4- **Matin Mahmoudifard**, Mahdi safi, Samaneh Rahmani, Ali Zaree, study of the UV absorption ability of carbon nanotubes, 1th congress on nano applications and industrial improvement, 2010, international University of Imam Khomeini, Qazvin, Iran.
 - 5- **Matin Mahmoudifard**, Manouchehr Vossoughi, Sara Soudi, Masood Soleimani, Novel covalent immobilization of antibody on electrospun nanofibrous membrane, Proceedings of 5th International Congress on Nanoscience & Nanotechnology (ICNN2014) 22-24 October 2014, Oral, Tarbiat Modares University, Tehran, Iran.
 - 6- **Matin Mahmoudifard**, Manouchehr Vossoughi, Sara Soudi, Masoud Soleimani, Covalent Antibody Immobilization on the Electrospun Nanofiber for High Sensitive Biosensor Applications, 6th international congress on advanced nanomaterial, Oral, 20-22 july 2015, Aveiro, Portugal.
 - 7- **Matin Mahmoudifard**, Masoud Soleimani, Sara Soudi, Manouchehr Vossoughi Electrospun Nanofibrous Membrane an Efficient Substrate for Microfluidic Based Biosensors, 6th International Conference on Nanostructures (ICNS6) 7-10 March 2016, Kish Island, Iran.
 - 8- **Matin Mahmoudifard**, Sensitive indirect ELISA biosensor based on the nanofibrous membrane, Seminar on Sensor Science and Technology (SSST 2015), 2015, Sharif university of technology, Tehran, Iran.
 - 9- **Matin Mahmoudifard**, Manouchehr Vossoughi, Masoud Soleimani, Plasma- treated electrospun polyacrylonitril nanofibrous membrane an effective substrate for antibody capturing, International conference on nanofibers, 2017, Oral, School of advanced technology in medicine, Tehran university of medical science, Tehran, Iran.
 - 10- Nasrin vahedi, Fatemeh Tabandeh, **Matin Mahmoudifard**, Study on reduction of polydispersity of hyaluronic acid produced by recombinant *Corynebacterium glutamicum* ", 11th International Chemical Engineering Congress & Exhibition (IChEC 2020) Fouman, Guilan, I. R. Iran.
 - 11- Sahar Asghari, **Matin Mahmoudifard***, fabrication of novel Core- shell nanofibrous membrane of polycaprolactone- hyaluronic acid as a promising platform for biomedical approaches, 8th International congress on nanoscience and nanotechnology (ICNN 2021), Mashhad university, Mashhad, Iran, February 17-18, 2021.
 - 12- Sahar Asghari, **Matin Mahmoudifard***, **core-shell nanofibrous membrane of** polycaprolactone- hyaluronic acid: a platform for the efficient capture of circulating tumor cells, 8th International congress on nanoscience and nanotechnology (ICNN 2021), Mashhad university, Mashhad, Iran, February 17-18, 2021.

Current and Previous Grants and Fellowships

1. Design and fabrication of core- shell PCL/GELATIN nanofiber for capture, release and detection of cancerous exosome, 2019, NIGEB, 704
2. Design and fabrication of core – shell nanofibrous membrane of PCL and HA for the capturing of circulating tumor cells (CTC) and the detection of them via hyaluronic acid-functionalized graphene quantum dots, 2020, NIGEB, 750
3. Synthesis of GO/CuI nanocomposite for antimicrobial applications, 2021, NIGEB, 789.
4. Design and fabrication of graphene derivatives modified with poly-dopamine and herbal extract as efficient cancer drug delivery system, NIGEB, 2021.
5. Fabrication of electrospun nanofibers containing especial herbal extract and nanomaterials as an efficient antimicrobial substrate and wound dressing, NIGEB, 2021.

6. Design and fabrication of novel magnetic nanoparticles for enzyme immobilization and cancer cell capture, NIGEB, 2022.

Teaching and supervision

1. Mohammad Raeiji, design and fabrication of electrospun nanofibrous membranes on the transwells for the brain vessel endothelial cell culture
2. Nasrin Vahedi, Preparation of graphene quantum dot/hyaluronic acid nanocomposite for drug delivery and imaging of cancer cells
3. Elena Ekrami, Synthesis of electrospun nanofibers containing natural antibiotic (lactosporin) for wound healing and skincare.
4. Fatemeh Barati, Design and fabrication of a biosensor based on electrospun nanofibers and GQDs for detecting prostate cancer
5. Sahar Asghari, Design and fabrication of core – shell nanofibrous membrane of PCL and HA for the capturing of circulating tumor cells (CTC) and the detection of them via hyaluronic acid-functionalized graphene quantum dots
6. Manijeh Avatefi, Preparation of aminated graphene quantum dot/hyaluronic acid nanocomposite for cancer cell detection.
7. Nima Khavanin zadeh, design and fabrication of fluorescent based nanobiosensor for heavy metals detection.
8. Nadia Nikkhah, enzyme immobilization on nano-magnetic structure.
9. Fariba Mohebichamkhorami, Brain Homogenate of a Rat Model of Alzheimer's Disease Modifies the Secretome of 3D Cultured Periodontal Ligament Stem Cells.
10. Sepideh Razani, electrospun nanofibers containing herbal extract as an efficient wound healing substrate
11. .Fatemeh Alamdaran, design of antimicrobial nano-platforms based on the graphene derivatives and herbal extracts.
12. Maria Valadbeigi, Study on the antibacterial effect of CuO nanoparticles on Klebsiella pneumonia bacteria: efficient treatment for colorectal cancer
13. Nahid Ghorbani, novel magnetic nanoparticles for Circulating Tumor cells (CTC) separation

Workshops

(As an
Executive
Person)

1. **Fifth international conference on nanostructures (ICNS5 2014)**, Sharif university of technology, Kish Island, Iran.
2. **Sixth international conference on nanostructures (ICNS5 2016)**, Sharif university of technology, Kish Island, Iran.
3. **Design and fabrication of microfluidic device and biosensors**, Sharif university of technology, 2016, Tehran, Iran.
4. **Cell culture and tissue engineering**, Sharif university of technology, 2015, Tehran, Iran.
5. **Nanotechnology in textile technology**, Imam Khomeini Mossalla, 2014, Tehran, Iran

(As an
Attending
Person)

1. **Summer school on stem cells, mRNA and tissue engineering**, Stem cell technology research center, 2015.
2. **Principles of animal cell culture**, Stem cell technology research center, 2015.
3. **Expansion of induced pluripotent stem cell (IPS)**, Stem cell technology research center, 2015.
4. **Lentiviral gene packaging and transduction of IPS Stem cell technology** research center, 2015.
5. **Gene transfer by pronuclear micro-injection**, Stem cell technology research center, 2015.
6. **Nanostructure scaffold preparation and stem cell culture**, Stem cell technology research center, 2015.
7. **Effect of nanomaterials on environment**, Imam Khomeini university, 1389, Qazvin, Iran.
8. **Quantum dot synthesis**, Imam Khomeini university, 1389, Qazvin, Iran.
9. **Primer designing**, 1392, Tarbiat modares university, Tehran, Iran.
10. **Preparation of scientific pictures**, Sharif university of technology, Tehran, Iran.

References

Name	Position	Place of work	Address/E-mail	Relation to applicant
Dr. Manuchehr Vossoughi	Full professor	Sharif university of technology	vosoughi@sharif.edu	PhD supervisor
Dr. Dina Morshedi	Associate professor	National institute for genetic engineering and biotechnology	morshedidina@yahoo.com	Colleague
Dr. Azam Irajizad	Full professor	Sharif university of technology	irajizad@yahoo.com	PhD professor
Dr. Saeed Aminzadeh	Associate professor	National institute for genetic engineering and biotechnology	aminzade@nigeb.ac.ir	Colleague