

CURRICULUM VITAE

Shima Tavakol, Ph.D.

Assistant Professor in Medical Nanotechnology
Fellowship in Nano-Tissue Engineering

Personal Information

Date of Birth: 08/29/1982

Place of Birth: Kashan

Nationality: Iranian

Married with one Prances

Languages: Persian, English

Address

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Education

Ph.D in Medical Nanotechnology, Tehran University of Medical Sciences, School of Advanced Technologies in Medicine, Tehran, Iran.

MSc in Medical Nanotechnology, Tehran University of Medical Sciences, School of Advanced Technologies in Medicine, Tehran, Iran.

BSc in Medical Laboratory sciences, Isfahan University of Medical Sciences, Isfahan, Iran.

Associate's Degree in Medical Laboratory sciences, Kashan University of Medical Sciences, Isfahan, Iran.

Research Interest

My research has particularly focused on designing and developing hydrogel-based nano-scaffolds along with drug nanocarriers for tissue engineering. Regarding cell biology issues within the field of nanomedicine, I study the behavior of normal and cancer cells in relation to nanoparticles and alterations in the cell environment.

I intend to extend my research on helping recovering patients with spinal cord injuries and craniofacial and vertebrate fractures in the coming years. My methods, designed biomaterials, and drug nanocarriers decrease the cost of revision surgeries for dental implants and sinus augmentation and reduce the cost of open surgery for the regeneration of craniofacial fractures and spinal cord injuries. For cancer, understanding cell death mechanisms reduces the cost of chemotherapy and improves its efficiency.

Professional Experience

- Professor, Anatomy Department, School of Medicine, Iran University of Medical Sciences, Tehran, Iran
- Associate Research Scientist, Medicine Department, School of Medicine, New York University, New York, NY, USA
- Lecturer of Anatomy, Dept. of Anatomy of Hormozgan University of Medical Sciences, School of Medicine

Past and Present Positions and Memberships

- Assistant Professor at Cellular and Molecular Research Center, Iran University of Medical Sciences, Tehran, Iran 2014- Continue
- CEO and Creator of Knowledge enterprise company “Tavakol Pars Biomimetic Technologies Company” 2019-Continue
- Member of Executive association of Iranian Society of Nanomedicine, <http://isnm.ir/Nano-News/84-%D9%8Fsecomisnm.html>. 2018- continue.
- Secretary of Education and Research Committee at Iranian Society of Nanomedicine, <http://isnm.ir/Nano-News/84-%D9%8Fsecomisnm.html>. 2014-2018. Head of Drug Nanocarriers Research Core at Razi Drug Research Center, Iran University of Medical Sciences, Tehran, Iran. 2015- 2016.
- Member of Nano-Tissue Engineering Committee, Presidency of the Islamic Republic of Iran, Vice Presidency for science and Technology. 2015-2018.
- Head of advanced Medical Sciences and Technologies association (AMST), Tehran University of Medical Sciences. Tehran. 2010- 2014.

Prizes/Awards

- Recognized and encouraged as the “**Faculty Member with higher than Hindex15 in 2019**” in Iran University of Medical Sciences by Iran University of Medical Sciences; **2020**.
- Recognized and encouraged as the “**Chosen Inventor of Year 2019**” in Iran University of Medical Sciences by Iran University of Medical Sciences; **2019**.
- Grant awarded as the “**Young Assistant Professors Grant**” by Ministry of Health and Medical Education; 2016.
- Recognized and encouraged as the “**Young Faculty Member Researcher**” in Iran University of Medical Sciences by Iran University of Medical Sciences; 2016.
- Recognized and encouraged as the **Best Ph.D. graduate of Nanotechnology** in Iran by Iranian Nanotechnology society; 2014.
- Recognized and encouraged as the **Best Ph.D. graduate** of School of Advanced Technologies in Medicine by Tehran University of Medical Sciences; 2014.
- Winner of **3rd poster prize** in the 9th The European Foundation for Clinical Nanomedicine (CLINAM) conference, 2016, Basel, Switzerland.
- **First Rank of Comprehensive Examination** among Ph.D. students; 2012.
- **3rd Rank countrywide**, PhD Program Entrance Examination held by Ministry of Health and Medical Education; 2010.
- Winner of the oral presentation prize in the 4th nanotechnology student’s conference; Tehran; 2008.
- **2nd Rank countrywide**, Master’s Degree Program Entrance Examination held by Ministry of Health and Medical Education; 2007.
- **Third rank in the field of laboratory science** among Technician degree Graduate; 2003.

Publications 2015-2020

Patents

- [Self-assembling peptide scaffolds](#). Shima Tavakol, Amin Almasi, Seyed Mahdi Rezayat. United States Patent, Patent number: 10485895
- Hydrogel based peptide nanofiber containing long motif of laminin for application in medical studies; International category A61, Patent no 82433.
- [Biodegradable and biocompatible nano composite t-plate implant and a method of synthesizing the same](#). Jafar Ai, Mahmood Azami, N Bahrami, Shima Tavakol. US Patent Publication number: 20140356410.

Books (Compilation)

- Nanoscience in Dermatology; Bioinspired nano-substrates for skin regeneration, 1 chapter, Elsevier (English) DOI: 10.1016/B978-0-12-802926-8.00026-4.
- Nanotechnology-Based Approaches for Targeting and Delivery of Drugs and Genes; Toxicity Concerns of Nanocarriers. 2017 - Academic Press (English).

- New Developments in Gold Nanomaterials Research; Gold nanoparticles for biomedical imaging and their biological response, 1 chapter, Nova publication (English) ISBN 978-163485385-9; 978-163485362-0.
- Nanomedicine. 2 chapters, Jahad Daneshgahi, Tehran, Iran, *Book Prize*.
- Introduction of Physiology (Persian) Publisher; Taaliye Andishe, Tehran, Iran.

Papers

https://scholar.google.com/citations?hl=en&user=ILJmhvEAAA&view_op=list_works&sortby=pubdate

1. In vivo gene delivery mediated by non-viral vectors for cancer therapy. Reza Mohammadinejad, Ali Dehshahri, Vijay Sagar Madamsetty, Masoumeh Zahmatkeshan, **Shima Tavakol**, Pooyan Makvandi, Danial Khorsandi, Abbas Pardakhty, Milad Ashrafizadeh, Elham Ghasemipour Afshar, Ali Zarrabi. Journal of Controlled Release (2020) IF:7.6
2. Necrotic, apoptotic and autophagic cell fates triggered by nanoparticles. Reza Mohammadinejad, Mohammad Amin Moosavi, **Shima Tavakol**, Deniz Özkan Vardar, Asieh Hosseini, Marveh Rahmati, Luciana Dini, Salik Hussain, Ali Mandegary, Daniel J. Klionsky. Journal of Autophagy. (2019). DOI: 10.1080/15548627.2018.1509171. IF:11.100
3. A Cell-Free SDKP-Conjugated Self-Assembling Peptide Hydrogel Sufficient for Improvement of Myocardial Infarction. Saman Firoozi, Sara Pahlavan, Mohammad-Hossein Ghanian, Shahram Rabbani, **Shima Tavakol**, Maryam Barekat, Saeed Yakhkeshi, Elena Mahmoudi, Mansoureh Soleymani, Hossein Baharvand. Biomolecules (2020) IF:4.69
4. COVID-19 Vaccines in Clinical Trials and their Mode of Action for Immunity against the Virus. **Shima Tavakol***, Mo S Alavijeh, Alexander M Seifalian. Current pharmaceutical design (2020) IF: 2.2
5. Graphene as a promising multifunctional nanoplatform for glioblastoma theranostic applications EG Afshar, A Zarrabi, A Dehshahri, M Ashrafizadeh, G Dehghannoudeh, **Shima Tavakol**. FlatChem (2020). IF: 3.9
6. Progress in Natural Compounds/siRNA Co-delivery Employing Nanovehicles for Cancer Therapy. Milad Ashrafizadeh, Ali Zarrabi, Kiavash Hushmandi, Farid Hashemi, Ebrahim Rahmani Moghadam, Mehdi Raei, Mahshad Kalantari, **Shima Tavakol**, Reza Mohammadinejad, Masoud Najafi, Franklin R Tay, Pooyan Makvandi. ACS combinatorial science (2020) IF: 3.8
7. C-Myc signaling pathway in treatment and prevention of brain tumors. Milad Ashrafizadeh, Ali Zarabi, Kiavash Hushmandi, Ebrahim Rahmani Moghadam, Farid Hashemi, Salman Daneshi, **Shima Tavakol**, R Mohammadinejad, M Najafi, N Dudha, M Garg. Current Cancer Drug Targets. (2020) IF: 3.52
8. Progress in delivery of siRNA-based therapeutics employing nano-vehicles for treatment of prostate cancer. Milad Ashrafizadeh, Kiavash Hushmandi, Ebrahim Rahmani Moghadam, Vahideh Zarrin, Sharareh Hosseinzadeh Kashani, Saied Bokaie, Masoud Najafi, **Shima**

- Tavakol**, Reza Mohammadinejad, Noushin Nabavi, Chia-Ling Hsieh, Atefeh Zarepour, Ehsan Nazarzadeh Zare, Ali Zarrabi, Pooyan Makvandi. *Bioengineering* (2020)
9. New Horizons in Hydrogels for Methotrexate Delivery. Ali Dehshahri, Anuj Kumar, Vijay Sagar Madamsetty, Ilona Uzielienė, **Shima Tavakol**, Fereshteh Azedi, Hojjat Samareh Fekri, Ali Zarrabi, Reza Mohammadinejad, Vijay Kumar Thakur. *Gels* (2020).
 10. Dual role of quercetin in enhancing the efficacy of cisplatin in chemotherapy and protection against its side effects: a review. M Najafi, **Shima Tavakol**, A Zarrabi, M Ashrafizadeh. *Archives of Physiology and Biochemistry* (2020). IF: 1.73
 11. Curcumin Delivery Mediated by Bio-Based Nanoparticles: A Review. Mahshid Moballegh Nasery, Banafshe Abadi, Delaram Poormoghadam, Ali Zarrabi, Peyman Keyhanvar, Hashem Khanbabaei, Milad Ashrafizadeh, Reza Mohammadinejad, **Shima Tavakol**, Gautam Sethi. *Molecules* (2020) IF: 3.06
 12. New Insight into Triple-Negative Breast Cancer Therapy: The Potential Roles of Endoplasmic Reticulum Stress and Autophagy Mechanisms. Milad Ashrafizadeh, Reza Mohammadinejad, **Shima Tavakol**, Zahra Ahmadi, Amihosseini Sahebkar. *Anti-cancer Agents in Medicinal Chemistry* (2020) IF: 2.04
 13. PD-1/PD-L1 axis regulation in cancer therapy: The role of long non-coding RNAs and microRNAs. Milad Ashrafizadeh, Ali Zarrabi, Kiavash Hushmandi, Vahideh Zarrin, Ebrahim Rahmani Moghadam, Amirhossein Zabolian, **Shima Tavakol**, Saeed Samarghandian, Masoud Najafi. *Life Sciences* (2020) IF: 3.64
 14. Acidic pH derived from cancer cells as a double-edged knife modulates wound healing through DNA repair genes and autophagy. Shadi Rabiee Motmaen, **Shima Tavakol***, Mohammad T Joghataei, Mahmoud Barati. *International wound journal* (2020) IF: 2.38
 15. Core and biological motif of self-assembling peptide nanofiber induce a stronger electrostatic interaction than BMP2 with BMP2 receptor 1A. **Shima Tavakol***, Bitar Rasoulia, Fatemeh Ramezani, Elham Hoveizi, Seyed Mahdi Rezayat. *Materials Science and Engineering: C* (101), (2019) 148-158. IF: 5
 16. Autophagy, anoikis, ferroptosis, necroptosis, and endoplasmic reticulum stress: Potential applications in melanoma therapy. M Ashrafizadeh, R Mohammadinejad, **Shima Tavakol**, Z Ahmadi, S Roomiani. (2019) *Journal of cellular physiology*. Doi: 10.1002/jcp.28740. IF: 4.5
 17. Strong binding active constituents of phytochemical to BMPR1A promote bone regeneration: In vitro, in silico docking, and in vivo studies. Bitar Rasoulia, Amin Almasi, Elham Hoveizi, Zohre Bagher, Parisa Hayat, Mohammad Taghi Joghataei, Seyed Mahdi Rezayat, **Shima Tavakol***. *Journal of cellular physiology* (2019) IF: 4.5
 18. Therapeutic effects of kaempferol affecting autophagy and endoplasmic reticulum stress. Milad Ashrafizadeh, **Shima Tavakol**, Zahra Ahmadi, Sahar Roomiani, Reza Mohammadinejad, Saeed Samarghandian, *Phytotherapy Research* (2019). IF: 3.76.
 19. Combinatorial effects of radiofrequency hyperthermia and radiotherapy in the presence of magneto-plasmonic nanoparticles on MCF-7 breast cancer cells. F Hadi, **Shima Tavakol**, S Laurent, V Pirhajati, SR Mahdavi, A Neshastehriz. *Journal of cellular physiology*. (2019) DOI: 10.1002/jcp.28599. IF: 4.5

20. Autophagy modulators: mechanistic aspects and drug delivery systems. **Shima Tavakol**, Milad Ashrafizadeh, Shuo Deng, Maryam Azarian, Asghar Abdoli, Mahsa Motavaf, Delaram Poormoghadam, Hashem Khanbabaei, Elham Ghasemipour Afshar, Ali Mandegary, Abbas Pardakhty, Celestial T Yap, Reza Mohammadinejad, Alan Prem Kumar. *Biomolecules* (2109). IF: 4.69
21. Berberine as a potential autophagy modulator. Reza Mohammadinejad, Zahra Ahmadi, **Shima Tavakol**, Milad Ashrafizadeh. *Journal of cellular physiology* (2019) IF:4.5
22. A combination therapy of nanoethosomal piroxicam formulation along with iontophoresis as an anti-inflammatory transdermal delivery system for wound healing. Mostafa Kazemi, Reza Mombeiny, **Shima Tavakol**, Peyman Keyhanvar, Kazem Mousavizadeh. *International Wound Journal* (2019). IF: 2.3
23. Autophagic, apoptotic, and necrotic cancer cell fates triggered by acidic pH microenvironment. Shadi Rabiee, **Shima Tavakol***, Mahmoud Barati, Mohammad Taghi Joghataei. *Journal of cellular physiology* (2019) 234 (7), 12061-12069. IF:4.5
24. Injectable PNIPAM/Hyaluronic acid hydrogels containing multipurpose modified particles for cartilage tissue engineering: Synthesis, characterization, drug release and cell. Zhaleh Atoufi, Seyed Kamran Kamrava, Seyed Mohammad Davachi, Majid Hassanabadi, Sadaf Saeedi Garakani, Rafieh Alizadeh, Mohammad Farhadi, **Shima Tavakol**, Zohreh Bagher, Ghodrattollah Hashemi Motlagh. *International journal of biological macromolecules* (2019) IF:4.78
25. Small molecule of sphingosine as a rescue of dopaminergic cells; A cell therapy approach in neurodegenerative diseases therapeutics. **Shima Tavakol***, Elham Hoveizi, Behnaz Tavakol, Fereshteh Azedi, Somayeh Ebrahimi, Peyman Keyhanvar. *Journal of Cellular Physiology*. (2018). IF:4.5
26. The impact of the particle size of curcumin nanocarriers and the ethanol on beta_1-integrin overexpression in fibroblasts: A regenerative pharmaceutical approach in skin repair. **Shima Tavakol***, Samaneh Zare, Elham Hoveizi, Behnaz Tavakol, Seyed Mahdi Rezayat. *DARU Journal of Pharmaceutical Sciences* (2019) IF: 2.69
27. Plate-shape carbonated hydroxyapatite/collagen nanocomposite hydrogel via in situ mineralization of hydroxyapatite concurrent with gelation of collagen at pH = 7. Sara Takallu, Esmaeil Mirzaei, Amir Azadi, Ayoob Karimizade, **Shima Tavakol**. *Journal of Biomedical Materials Research Part B: Applied Biomaterials* (2019) IF: 2.67
28. Evaluation of the effects of hyaluronic acid on poly (3-hydroxybutyrate)/chitosan/carbon nanotubes electrospun scaffold: structure and mechanical properties. Mohammad Nikbakht, Saeed Karbasi, Seyed Mahdi Rezayat, **Shima Tavakol**, Esmaeel Sharifi. *Polymer-Plastics Technology and Materials* (2019).
29. Monoterpenes modulating autophagy: A review study. **Shima Tavakol**, Ashrafizadeh M, Ahmadi Z, Mohammadinejad R, Kaviyani N. *Basic & Clinical Pharmacology & Toxicology* (2019) IF: 2.45
30. Electrospun Nanofibers for Diabetes: Tissue Engineering and Cell-Based Therapies. Elham Hoveizi, **Shima Tavakol**, Sadegh Shirian, Khadije Sanamiri. *Current stem cell research & therapy* (2019) IF: 2.61

31. Therapeutic potential of human mesenchymal stem cells derived beta cell precursors on a nanofibrous scaffold: An approach to treat diabetes mellitus. Elham Hoveizi, **Shima Tavakol**. *Journal of Cellular Physiology*. (2018).
32. Naringin-loaded Poly (ϵ -caprolactone)/Gelatin Electrospun Mat as a Potential Wound Dressing: In vitro and In vivo Evaluation. Majid Salehi, Ahmad Vaez, Mahdi Naseri- 4 Nosar, Saeed Farzamfar, Arman Ai, Jafar Ai, **Shima Tavakol**, Mehrdad Khakbiz, Somayeh Ebrahimi-Barough. *Fibers and Polymers* (2018). DOI: 10.1007/s12221-018- 7528-6.
33. Application of electrospun gelatin nanofibers in tissue engineering. Majid Naghibzadeh, Saman Firoozi, Fatemeh Sadeghian Nodoushan, Mohsen Adabi, Arezoo Khoradmehr, Farzaneh Fesahat, Seyedeh Sara Esnaashari, Masood Khosravani, Mandi Adabi, **Shima Tavakol**, Hamidreza Pazoki-Toroudi, Moein Adel, Masoumeh Zahmatkeshan. *Biointerface Research in Applied Chemistry*. (2018)
34. Human Endometrial Stem Cell Isolation from Endometrium and Menstrual Blood. **Shima Tavakol**, Freshteh Azedi, Elham Hoveizi, Jafar Ai, Mohammad Taghi Joghataei. *Bioprotocol*. (2018). 0.21769/BioProtoc.2693.
35. The Level of Testosterone, Vitamin D, and Irregular Menstruation More Important than Omega-3 in Non-Symptomatic Women Will Define the Fate of Multiple Scleroses in Future. S Tavakol, S Shakibapour, SA Bidgoli. **Shima Tavakol**, S Shakibapour, SA Bidgoli. *Molecular neurobiology* (2016) 1-8.
36. Noggin along with a self-assembling peptide nanofiber containing long motif of laminin induces tyrosine hydroxylase gene expression. **Shima Tavakol***, Sayed Mostafa Modarres Mousavi, Behnaz Tavakol, Elham Hoveizi, Jafar Ai, Seyed Mahdi Rezayat. *Molecular Neurobiology* (2016) DOI: 10.1007/s12035-016-0006-0.
37. Mechano-transduction signals derived from self-assembling peptide nanofibers containing long motif of laminin influences neurogenesis in in-vitro and in-vivo. **Shima Tavakol***, Sayed Mostafa Modarres Mousavi, Behnaz Tavakol, Elham Hoveizi, Jafar Ai, Seyed Mahdi Rezayat. *Molecular Neurobiology* (2016) DOI 10.1007/s12035-016-9836-z.
38. In Vitro Differentiation of Human iPS Cells into Neural like Cells on a Biomimetic Polyurea. E Hoveizi, S Ebrahimi-barough, **Shima Tavakol**, K Sanamiri. *Molecular neurobiology* (2016) DOI 10.1007/s12035-015-9663-7.
39. Organelles and chromatin fragmentation of human umbilical vein endothelial cell influence by the effects of Zeta potential and size of silver nanoparticles in different manners. **Shima Tavakol***, Elham Hoveizi, Roya KARIMI, Seyed Mahdi Rezayat. *Artificial Cells, Nanomedicine, and Biotechnology*. 2016. DOI 10.1080/21691401.2016.1178132.
40. Healing potential of fibroblast cells cultured on a PLA/CS nanofibrous scaffold in skin regeneration in Wistar rat. E Hoveizi, T Mohammadi, S Ebrahimi-Barough, **Shima Tavakol**. *Koomesh* 17 (3), 677-685, En77.
41. Self-assembling peptide nanofiber containing long motif of laminin induces neural differentiation, tubulin polymerization and neurogenesis; in-vitro, ex-vivo and in-vivo studies. **Shima Tavakol**, Reza Saber, Elham Hoveizi, Hadi Aligholi, Jafar Ai, Seyed Mahdi Rezayat. *Molecular Neurobiology*. (2015) DOI 10.1007/s12035-015-9448-z
42. Chimeric self-assembling nanofiber containing bone marrow homing peptide's motif induces motor neuron recovery in animal model of chronic spinal cord injury; an in-vitro and in-vivo

- investigations. **Shima Tavakol**, Reza Saber, Elham Hoveizi, Hadi Aligholi, Jafar Ai, Seyed Mahdi Rezayat. *Molecular Neurobiology*. (2015) DOI 10.1007/s12035-015-9266-3.
43. Acidic pH derived from cancer cells may induce failed reprogramming of normal differentiated cells adjacent tumor cells and turn them into cancer cells. **Shima Tavakol***. *Medical Hypothesis* (2014) 13;83(6):668-672.
44. In vitro comparative survey of cell adhesion and proliferation of human induced pluripotent stem cells on surfaces of polymeric electrospun nanofibrous and solution-cast film scaffolds. S Ebrahimi-barough, **Shima Tavakol**, M Nabiuni. *Journal of Biomedical Materials Research Part A*. (2015) DOI: 10.1002/jbm.a.35420.
45. Self-Assembling Peptide Nanofiber Containing Biologic Motif Induces Neural Differentiation, Tubulin Polymerization and Neurogenesis; In-Vitro, Ex-Vivo and In-Vivo Studies. **Shima Tavakol**, Reza Saber, Elham Hoveizi, Hadi Aligholi, Jafar Ai, Seyed Mahdi Rezayat. *The Neuroscience Journal of Shefaye Khatam* (2014) 2 (4), 49-49.
46. Preparation of Pure PLLA, Pure Chitosan and PLLA/Chitosan Blend Porous Tissue Engineering Scaffolds by Thermally Induced Phase Separation Method and Evolution of the Corresponding Mechanical and Biological Properties. M ajid Salehi; Naseri Nosar; Amir Amani; Mahmood Azami; **shima Tavakol**; Hossein Ghanbari. *International Journal of Polymeric Materials and Polymeric Biomaterials*. (2015) 64 (13): 675-682.
47. Differential effect of Activin A and WNT3a on definitive endoderm differentiation onelectrospun nanofibrous PCL scaffold. Elham hoveizi1, Jafar Ai, Somayeh Ebrahimi-barough and **Shima Tavakol**. *Cell Biology International*. (2015) 39 (5), 591-599. DOI: 10.1002/cbin.10430.