Curriculum Vitae

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Personal details

Name: **Farhang Aliakbari**

Address: National Institute of Genetic Engineering and Biotechnology (NIGEB), Tehran, Iran.

Email: aliakbari@nigeb.ac.ir aliakbari110@gmail.com

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Education and research records:

Postdoctoral Associate: The exosome-mediated mechanism of tau transferring from the brain to the spinal cord to start the pathology of ALS.
University of Western Ontario, London, Ontario, Canada, 2022-2024.

Postdoctoral Fellow: The effects of mesenchymal stem cell–derived exosomes combined with nanoliposomes-incorporated anti-neurotoxin drug (exosome-liposome hybrid) on the degeneration and regeneration of neurons.
National Institute of Genetic Engineering and Biotechnology (NIGEB), Tehran, Iran. 2020-2022. Supported by Iran National Science Foundation (INSF).

Ph.D: Medical Biotechnology, Semnan University of Medical Sciences, Semnan, Iran,
2012-2018. CGPA: 19:41 / 20.00

Thesis topic: Evaluation of the liposomal nanosystems impact on the fibrillation of alpha-synuclein and neurotoxicity

Thesis grade: 19:97 / 20.00

M.Sc.: Cellular and Molecular Biology (Microbiology), Azad Islamic University (North Tehran Branch),
Tehran, Iran. 2002-2005. CGPA: 17:33 / 20.00

Thesis topic: Determination of Deoxynivalenol contamination in corn crops at Golestan in Iran.

Thesis grade: 19:25 / 20.00

Peer-reviewed Publications:

Most important:

1. **Farhang Aliakbari**, Kimia Marzookian, Soha Parsafar, Hamdam Hourfar, Zahra Nayeri, Arghavan Fattahi, Mohammad Raeiji, Narges Nasrollahi Boroujeni, Daniel E Otzen, Dina Morshedi. The impact of hUC MSC-derived exosome-nanoliposome hybrids on α-synuclein fibrillation and neurotoxicity. ***Science Advances (2024)***, 10(14), eadl3406 **(Impact Factor (IF): 11.7, Citation: 20).**

2. **Farhang Aliakbari**, Hossein Mohammad-Beigi, Nasrollah Rezaei-Ghaleh, Frederik Lermyte, Soha Parsafar, Stefan Becker, Peter B. O'Connor, Joanna F. Collingwood, Gunna Christiansen, Duncan S. Sutherland, Poul Henning Jensen, Dina Morshedi, Daniel E. Otzen. Multiple protective roles of nanoliposome-incorporated baicalein against alpha-synuclein aggregates. ***Advanced Functional Materials (2021),*** 2007765 (1 of 16) **(IF: 18.9, Citation: 22).**

3. Hossein Mohammad-Beigi, **Farhang Aliakbari,** Cagla Sahin, Charlotte Lomax, Ahmed Tawfike, Nicholas P. Schafer, Alireza Amiri-nodije, Hoda Eskandari, Mehdi Hosseini-Mazinani, Gunna Christiansen, Jane L. Ward, Dina Morshedi, Daniel E. Otzen. Oleuropein derivatives from olive fruit extracts reduce α-synuclein fibrillation and oligomer toxicity. ***Journal of Biological Chemistry (2019),*** 15;294(11):4215-4232 **(IF: 4, Citation: 80).**

4. **Farhang Aliakbari**, Hossein Mohammad-Beigi, Nasrollah Rezaei-Ghaleh, Stefan Becker, Faezeh Dehghani Esmatabad, Hadieh Alsadat Eslampanah Seyedi, Hassan Bardania, Amir Tayaranian Marvian, Joanna Collingwood, Gunna Christiansen,

Markus Zweckstetter, Daniel E. Otzen and Dina Morshedi. The potential of zwitterionic nanoliposomes against neurotoxic alpha-synuclein aggregates in Parkinson's Disease. ***Nanoscale, (2018),*** 10 (19), 9174-9185 **(IF: 5.8, Citation: 41).**

5. **Farhang Aliakbari**, Ali. Akbar Shabani, Hassan Bardania, Hossein Mohammad-Beigi, Amir Tayaranian Marvian, Faezeh Dehghani Esmatabad, Abbas Ali Vafaei, Seyed Abbas Shojaosadati, Ali Akbar Saboury, Gunna Christiansen, Daniel E. Otzen, Dina Morshedi. Formulation and anti-neurotoxic activity of baicalein-incorporating neutral nanoliposomes. ***Colloids and surface B: Biointerfaces (2018)***. 161: 578–587**(IF: 5.4, Citation: 50).**

Others:

2025:

6. Marzookian, Kimia, **Farhang Aliakbari**, Hamdam Hourfar, Farzaneh Sabouni, Daniel E. Otzen, and Dina Morshedi. The neuroprotective effect of human umbilical cord MSCs-derived secretome against α-synuclein aggregates on the blood-brain barrier. ***International Journal of Biological Macromolecules (2025):*** 140387 **(IF: 7.7, Citation: 2).**

7. Nabipour, Hafezeh, **Farhang Aliakbari**, Kathryn Volkening, Michael J. Strong, and Sohrab Rohani. Development of metal-organic framework biocomposites from chitosan as drug delivery vehicles: In vitro evaluation on HeLa and SH-SY5Y cell lines. ***International Journal of Biological Macromolecules*** 291 ***(2025):*** 138878 **(IF: 7.7, Citation: 2).**

8. Boroujeni, Narges Nasrollahi, Mehregan Rahmani, **Farhang Aliakbari**, Mohammad Taghi Ahmadian, and Dina Morshedi. Enhancement of the Blood-Brain Barrier Permeability due to Interaction of Focused Ultrasound and Nano-Bubbles-In Vitro Sonoporation. ***Frontiers in Biomedical Technologies*** 12 ***(2025)*** **(IF: 0.38, Citation: 0).**

9. Nabipour, Hafezeh, **Farhang Aliakbari**, Kathryn Volkening, Michael J. Strong, and Sohrab Rohani. Novel metal-organic framework coated with chitosan-κ-carrageenan as a platform for curcumin delivery to cancer cells. ***International Journal of Biological Macromolecules (2025):*** 140027 **(IF: 7.7, Citation: 4).**

2024:

10. **Farhang Aliakbari**, Noah B Stocek, Maxximuss Cole-André, Janice Gomes, Giovanni Fanchini, Stephen H Pasternak, Gunna Christiansen, Dina Morshedi, Kathryn Volkening, Michael J Strong. A methodological primer of extracellular vesicles isolation and characterization via different techniques. ***Biology Methods and Protocols (2024)***, 9(1), bpae009 **(IF: 2.5, Citation: 17).**

11. Erin Santandrea, **Farhang Aliakbari**, Emily Truscott, Lynda McCaig, Neil S Donison, Danielle Graham, Michael J Strong, Kathryn Volkening. A technique for repeated blood and cerebrospinal fluid sampling from individual rats over time without the need for repeated anesthesia. ***Scientific Reports (2024)***, 14 (1), 5171 **(IF: 3.8, Citation:0).**

12. Hafezeh Nabipour, **Farhang Aliakbari**, Kathryn Volkening, Michael J Strong, Sohrab Rohani. The development of a bio-based metal-organic framework coated with carboxymethyl cellulose with the ability to deliver curcumin with anticancer properties. ***Materials Today Chemistry (2024)***, 37, 101976 **(IF: 6.7, Citation: 19).**

13. Shahsavari, S., Rad, M.B., Hajiaghajani, A., Rostami, M., Hakimian, F., Jafarzadeh, S., Hasany, M., Collingwood, J.F., **Aliakbari, F.,** Fouladiha, H. and Bardania, H. Magnetoresponsive liposomes applications in nanomedicine: A comprehensive review. ***Biomedicine & Pharmacotherapy*** 181 ***(2024):*** 117665 **(IF: 6.9, Citation: 0).**

2023:

14. Hafezeh Nabipour, **Farhang Aliakbari**, Kathryn Volkening, Michael J. Strong, and Sohrab Rohani. New metal-organic framework coated sodium alginate for the delivery of curcumin as a sustainable drug delivery and cancer therapy system. ***International Journal of Biological Macromolecules (2023)***: 128875 **(IF: 7.7, Citation: 29).**

15. Hourfar, Hamdam, **Farhang Aliakbari**, Shabboo Rahimi Aqdam, Zahra Nayeri, Hassan Bardania, Daniel E. Otzen, and Dina Morshedi. The impact of α-synuclein aggregates on blood-brain barrier integrity in the presence of neurovascular unit cells***. International Journal of Biological Macromolecules (2023)***. 229: 305-320 **(IF: 7.7, Citation: 23).**

16. Khaleghi, Maryam, Fakhri Haghi, Mina Gholami, Hamdam Hourfar, Farshad Shahi, Ali Mir Mousavi Zekoloujeh, **Farhang Aliakbari,** Ebrahim Ahmadi, and Dina Morshedi. A fabricated hydrogel of hyaluronic acid/curcumin shows super-activity to heal the bacterial infected wound. ***AMB Express (2023)*** 13 (1): P29 **(IF: 3.5, Citation: 14).**

2022:

17. Zahra Nayeri, **Farhang Aliakbari,** Farzaneh Afzali, Soha Parsafar, Ehsan Gharib, D. Otzen, and Dina Morshedi. Characterization of exogenous αSN response genes and their relation to Parkinson's disease using network analyses. ***Frontiers in pharmacology (2022)*** 13 **(IF: 4.4, Citation: 0).**

18. Parsafar, Soha, **Farhang Aliakbari**, Sepideh Sadat Seyedfatemi, Zahra Najarzadeh, Hamdam Hourfar, Hassan Bardania, Mohsen Farhadpour, Mehdi Mohammadi, and Dina Morshedi. Insights into the inhibitory mechanism of skullcapflavone II against α-synuclein aggregation and its mediated cytotoxicity. ***International Journal of Biological Macromolecules (2022)*** 209: 426-440 **(IF: 7.7, Citation: 10).**

2021:

19. Otzen, Daniel E., Dina Morshedi, Hossein Mohammad-Beigi, **Farhang Aliakbari.** A Triple Role for a Bilayer: Using Nanoliposomes to Cross and Protect Cellular Membranes. ***The Journal of Membrane Biology (2021),*** 1-11 **(IF: 2.35, Citation: 3).**

20. Dina Morshedi, **Farhang Aliakbari,** Soha Parsafar, Hossein Mohammad-Beigi, Faezeh Dehghani Esmatabad, and Alireza Amiri-Nowdijeh. Using olive methanolic extracts to inhibit rotenone toxicity in Parkinson's cell model. ***Cellular and Molecular Research (Iranian Journal of Biology)*** (2021), 34, no. 2: 288-303 **(No IF, Persian article).**

2020:

21. Amir Tayaranian Marvian, **Farhang Aliakbari**, Hossein Mohammad-Beigi, Zeinab Alsadat Ahmadi, Sina Mehrpouyan, Frederik Lermyte, Mahour Nasouti, Joanna F. Collingwood, Daniel E. Otzen, and Dina Morshedi. The status of the terminal regions of α-synuclein in different forms of aggregates during fibrillization. ***International Journal of Biological Macromolecules (2020),*** *155: 543-550* **(IF: 7.7, Citation: 7).**

22. Malakouti–Nejad, Maryam, Hasan Bardania, **Farhang Aliakbari**, Alireza Baradaran-Rafii, Elahe Elahi, Daniela Monti, and Dina Morshedi. Formulation of nanoliposome-encapsulated bevacizumab (Avastin): Statistical optimization for enhanced drug encapsulation and properties evaluation. ***International Journal of Pharmaceutics (2020)***, 119895 **(IF: 5.3, Citation: 20).**

23. Soha Parsafar, Zahra Nayeri, **Farhang Aliakbari**, Farshad Shahi, Mehdi Mohammadi, Dina Morshedi. Multiple neuroprotective feature of *Scutellaria pinnatifida*-derived small molecule. ***Heliyon (2020),*** 6(8), p.e04737 **(IF: 3.4, Citation: 14).**

24. Maryam Khaleghi, Ebrahim Ahmadi, Mahvash Khodabandeh Shahraki, **Farhang Aliakbari**, and Dina Morshedi. Temperature-dependent formulation of a hydrogel based on Hyaluronic acid-polydimethylsiloxane for biomedical applications. ***Heliyon (2020),*** 6(3), p.e03494 **(IF: 3.4, Citation: 34).**

2019:

25. Marvian, Amir Tayaranian, David J. Koss, **Farhang Aliakbari**, Dina Morshedi, Tiago Fleming Outeiro. *In vitro* models of synucleinopathies: informing on molecular mechanisms and protective strategies. ***Journal of neurochemistry*** **(2019),** 150(5):535-565 **(IF: 4.609, Citation: 33).**

26. Sayed Ali Maboudi, **Farhang Aliakbari**, Seyed Abbas shojaosadati, Ayyoob Arpanaei. Theranostic magnetite cluster@silica@albumin double-shell particles as suitable carriers for water-insoluble drugs and enhanced T2 MR imaging contrast agents. ***Materials Science & Engineering C.*** 99 **(2019)**: 1485-1492 **(IF: 7.32, Citation: 25).**

27. Hossein Mohammad-Beigi, Lars Kjær, Hoda Eskandari, **Farhang Aliakbari**, Gunna Christiansen, Gianluca Ruvo, Jane Ward, and Daniel E. Otzen. A Possible Connection Between Plant Longevity and the Absence of Protein Fibrillation: Basis for Identifying Aggregation Inhibitors in Plants. ***Frontiers in Plant Science (2019)***, 13;10:148 **(IF: 3.677, Citation: 13).**

28. Tafvizizavareh, Shima, Parvin Shariati, Atefeh Sharifirad, Behnam Maleki, **Farhang Aliakbari**, Guanna Christiansen, and Dina Morshedi. Antibiotic hypersensitivity in MRSA induced by special protein aggregates. ***International journal of biological macromolecules*** 137 ***(2019)****:* 528-536 **(IF: 7.7, Citation: 7).**

29. Mansooreh Heravi, Leila Dargahi, Amir Tayaranian Marvian, Soha Parsafar, **Farhang Aliakbari**, Dina Morshedi. The primary hippocampal neuronal cells are more resistant than PC12 cells to alpha-synuclein toxic aggregates. ***Neuroscience Letters*** 701 **(2019)**: 38-47 **(IF: 3.046, Citation: 17).**

30. Reza Mahmoudi, Maryam Tajali, Behnam Hajipour Verdom, Abouzar Bagheri, Hossein Mohammad-beigi, **Farhang Aliakbari**, Zeynab Salehpour, Mohsen Alipour, Sajad Afrouz, Hassan Bardania. Chitosan nanoparticles containing Physalis alkekengi-L extract: preparation, optimization, antioxidant activity and its cytotoxicity. ***Bulletin of Materials Science (2019)***, 42: (3) 131 **(IF: 1.8, Citation: 42).**

31. Hassan Bardania, Seyed Abbas Shojaosadati, Farzad Kobarfard, Dina Morshedi, **Farhang Aliakbari**, Mohammad Taher Tahoori, Elahe Roshani. RGD-modified nano-liposomes encapsulated eptifibatide with proper hemocompatibility and cytotoxicity effect. ***Iranian Journal of Biotechnology (2019),*** 17(2) **(IF: 0.973, Citation: 35).**

32. Dina Morshedi, **Farhang Aliakbari**, Soha Parsafar, Hossein Mohammad-Beigi, Faezeh Dehghani Esmatabad, Alireza Amiri-Nowdijeh. Using olive methanolic extracts to inhibit rotenone toxicity in Parkinson's cell model. ***Journal of Cellular and Molecular Research (Iranian Journal of Biology) (2019)*** **(No IF, Persian article).**

2018:

33. Mahdiyeh Sashourpour, Dina Morshedi, Saber Zahri, **Farhang Aliakbari**, Marziyeh Fotovvat, Tayyebeh Radjabian. Inhibitory Effect of *Scutellaria pinnatifida* Extracts on the Alpha Synuclein Cytotoxicity. ***Journal of Medicinal Plants, (2018),*** 1(69), pp.34-46 **(No IF, Persian article, Citation: 1).**

2017:

34. **Farhang Aliakbari**, Ali. Akbar Shabani, Hassan Bardania, Hadieh Alsadat Eslampanah Seyedi, Hossein Mohammad-Beigi, Amir Tayaranian Marvian, Mahour Nassoti, Abbas Ali Vafaei, Gunna Christiansen, Seyed Abbas Shojaosadati, Ali Akbar Saboury, Dina Morshedi. Neurotoxicity of pre-incubated alpha-synuclein with neutral nanoliposomes on PC12 and SHSY5Y cell lines. ***Scientia Iranica (2017).*** 24(6) 3542-3553 **(IF: 1.025, Citation: 5).**

2016:

35. Nayere Taebnia, Dina Morshedi, Soheila Yaghmaei, **Farhang Aliakbari**, Fatemeh Rahimi, Ayyoob Arpanaei. Curcumin-Loaded Amine-Functionalized Mesoporous Silica Nanoparticles Inhibit α-Synuclein Fibrillation and Reduce Its Cytotoxicity-Associated Effects. ***Langmuir (2016),*** 32(50): 13394-13402. **(IF: 3.9, Citations: 85).**

36. Dizaji, Negar Mirzazadeh, Hossein Mohammad-beigi, **Farhang Aliakbari,** Amir Tayaranian Marvian, Seyed Abbas Shojaosadati, and Dina Morshedi. Inhibition of lysozyme fibrillation by human serum albumin nanoparticles: Possible mechanism. ***International Journal of Biological Macromolecules (2016).*** 93: 1328-1336 **(IF: 7.7, Citations: 10).**

37. Hossein Mohammad-Beigi, Dina Morshedi, Seyed Abbas Shojaosadati, Jannik Nedergaard Pedersen, Amir Tayaranian Marvian, **Farhang Aliakbari**, Gunna Christiansen, Jan Skov Pedersen, and Daniel E. Otzen. Gallic acid loaded onto polyethylenimine-coated human serum albumin nanoparticles (PEI-HSA-GA NPs) stabilizes α-synuclein in the unfolded conformation and inhibits aggregation. ***RSC Advances (2016)*** 6(88): 85312-85323 **(IF: 3.9, Citations: 29).**

2015:

38. Nayere Taebnia, Dina Morshedi, Mohsen Doostkam, Soheila Yaghmaei, **Farhang Aliakbari**, Gurvinder Singh, and Ayyoob Arpanaei. The effect of mesoporous silica nanoparticle surface chemistry and concentration on the α-synuclein fibrillation. ***RSC Advances (2015)***. 5(75): 60966-60974 **(IF: 3.9, Citations: 32).**

39. Dina Morshedi, **Farhang Aliakbari**, Amir Tayaranian Marvian, Afshin Fassihi, Horacio Pérez-Sánchez, Francisco Pan-Montojo. Cuminaldehyde as the major component of *Cuminum cyminum*, a natural aldehyde with inhibitory effect on alpha-synuclein fibrillation and cytotoxicity. ***Journal of food science (2015)***. 80(10): H2336-H2345 **(IF: 1.815, Citations: 117).**

40. Masoome Khalife, Dina Morshedi, **Farhang Aliakbari**, Hossein Mohammad Beigi, Amir Tayaranian Marvian, Sadegh Azimzadeh Jamalkandi, Francisco Pan-Montojo. Alpha-synuclein fibrils interact with dopamine reducing its cytotoxicity on PC12 cells. ***The Protein Journal (2015)***. 34(4): 291-303 **(IF: 1.139, Citations: 9).**

2014:

41. Dina Morshedi, Tayyebali Salmani Kesejini, **Farhang Aliakbari,** Rouhollah Karami-Osboo, Mehdi Shakibaee, Masoome Khalife, Mona Soroush, Amir Tayaranian Marvian. Identification and characterization of a compound of *Cuminum cyminum* essential oils with high antifibrillation effect and cytotoxic effect. ***Research in Pharmaceutical Sciences (2014)***, 9(6): 431-443 **(Still does not have IF, Citations: 21).**

42. Farhang Aliakbari, Seyedeh Felour Mazhar, Rouhollah Karami-Osboo, Parvin Shariati, Dina Morshedi, Davoud Farajzadeh. Decontamination of tomato, red cabbage, carrot, fresh parsley and fresh green onion inoculated with *Shigella sonnei* and *Shigella flexneri* by some Essential oils (in vitro conditions). ***Novelty in Biomedicine (2014)***, 2(2):36-46 **(No IF, Citations: 1).**

43. Seyedeh Felour Mazhar, **Farhang Aliakbari**, Rouhollah Karami-osboo, Dina Morshedi, Parvin Shariati, Davoud Farajzadeh. Inhibitory effects of several Essential oils towards *Salmonella typhimurium*, *Salmonella paratyphi A* and *Salmonella paratyphi B*. ***Applied Food Biotechnology (2014)***. 1(1), 45-54 **(IF: 1.28, Citations: 16).**

44. Dina Morshedi, **Farhang Aliakbari,** Hamid Reza Noori, Majid Lotfinia. Using small molecules as a new challenge to redirect metabolic pathway. ***3 Biotech (2014)***. 4(5), 513-522 **(IF: 1.361, Citations: 1).**

2013 and before:

45. Dina Morshedi, Zeinab Mohammadi, Masoud Mashhadi Akbar Boojar, **Farhang Aliakbari**. Using protein nanofibrils to remove azo dyes from aqueous solution by the coagulation process. ***Colloids and Surfaces B: Biointerfaces (2013)***. 112: 245–254 **(IF: 5.4, Citations: 124).**

46. Dina Morshedi, **Farhang Aliakbari**, The inhibitory effects of cuminaldehyde on the amyloid fibrillation and cytotoxicity of alpha-synuclein. ***Modares Journal of Medical Sciences: Pathobiology (2012)****:* 15(1): 13-28 **(No IF, Citations: 13).**

47. Rouhollah Karami-Osboo, Mehdi Khodaverdi, **Farhang Aliakbari**. Antibacterial Effect of Effective Compounds of *Satureja hortensis* and *Thymus vulgaris* Essential Oils against *Erwinia amylovora*. ***Journal of Agricultural Science and Technology (2010)***. 12: 35-45 **(IF: 0.815, Citations: 107).**

48. Rouhollah Karami-osboo, Mansooreh Mirabolfathy, **Farhang Aliakbari**, Natural Deoxynivalenol contamination of corn produced at Golestan and moqan areas in Iran. ***Journal of Agricultural Science and Technology (2010)***. 12: 233-239 **(IF: 0.815, Citations: 34).**

49. Farhang Aliakbari, Mansooreh Mirabolfathy, Masoud Emami, Seyedeh Flour Mazhar, Rouhollah Karami-osboo. Natural occurrence of *Fusarium* species in maize kernels at Gholestan province in northern parts of Iran. ***Asian journal of plant sciences (2007)***. 6(8): 1276-1281 **(IF: 0.41, Citations: 23).**

Abstracts and presentations:

Oral presentations (I was the presenter):

1. Dina Morshedi, **Farhang Aliakbari,** Zeinab Mohammadi, Using protein nano-biomaterial prepared from fish waste to remove azo dyes by the coagulation process. The 8th National Biotechnology Congress of Iran and the 4th Congress on Biosafety and Genetic Engineering. July 6-8, 2013 Tehran, Iran.
2. Dina Morshedi, **Farhang Aliakbari,** Majid Lotfinia, Jafar Fallahi, Using small molecules as new challenge to redirect metabolic pathway in order to decrease acetate toxicity. The 8th National Biotechnology Congress of Iran and the 4th Congress on Biosafety and Genetic Engineering. July 6-8, 2013 Tehran, Iran.

3. Dina Morshedi, **Farhang Aliakbari**. Inhibition of Alpha synuclein amyloid fibrillation by Cuminaldehyde and its cytotoxicity assessment on SK-N-MC cells. The 5th Annual Research Conference of Iran's Northern Universities of Medical Sciences. Semnan, Iran. 2012. P: 165
4. Dina Morshedi, **Farhang Aliakbari.** Different anti amyloidogenic effects of two essential oils' compounds, Cuminaldehyde and Alpha-terpineol, on fibril formation of two amyloidogenic protein. National Congress on Medicinal Plants, Kish, Iran. 2012. P: 135.
5. **Farhang Aliakbari**, Mansooreh Mirabolfathy, Masoud Emami, Rouhollah Karami-osboo. Monitoring of Deoxynivalenol (DON) in corn crop at Golestan Province. 17th congress of Plant Pathology. Karaj. Iran. 2006. p: 509.

Poster presentations:

6. Mahdi Karimian, Alireza Alikhanian, **Farhang Aliakbari**, Dina Morshedi. Aptamer can prevent amyloidal aggerates formation in α-synuclein, potentially leading to a new approach for targeted Parkinson's disease (PD) treatment. 13th Basic and Clinical Neuroscience Congress, December 11-13, 2024. Abstract ID: 311, Tehran, Iran.
7. Kimia Marzookian, **Farhang Aliakbari**, Dina Morshedi. Mesenchymal stem cell-derived exosomes inhibit α-synuclein aggregation: A potential therapeutic strategy for Parkinson's disease. 13th Basic and Clinical Neuroscience Congress, December 11-13, 2024. Abstract ID: 535, Tehran, Iran.
8. Sevil Babashpour, Dina Morshedi, **Farhang Aliakbari**. Investigating the Potential of Natural Small Molecules as BDNF Mimics for Neurodegenerative Disease Treatment: A Molecular Docking Study with TrkB Receptor. 4th International & 13th Iranian Conference on Bioinformatics. February 4-6, 2025, ICB13 -1231 Zanjan, Iran.
9. **Farhang Aliakbari**, Kathryn Volkening, Michael J Strong. Tau and TDP-43 may transfer from cell to cell through exosomes, a strategy for early diagnosis of ALS. CIRCULATING BIOMARKERS-EXTRACELLULAR VESICLES EUROPE 2023, June 19-20, 2023, Rotterdam, The Netherland
10. **Farhang Aliakbari**, Dina Morshedi1, Hossein Mohammad-Beigi, Daniel E. Otzen. Baicalein-incorporated nanoliposome disaggregates alpha-synuclein fibrils. International Congress of Parkinson's Disease and Movement Disorders, September 22 – 26, **2019** in Nice, France. Abstract No. 769. https://www.mdsabstracts.org/abstract/baicalein-incorporated-nanoliposome-disaggregates-alpha-synuclein-fibrils/
11. **Farhang Aliakbari**, D. Morshedi, A.A. Shabani, H. Mohammad Beigi, A. Tayaranian Marvian, P. Shariati, S.A. Shojaosadati, A.A. Saboury. Diverse effects of alpha-synuclein fibrils on various neuron cell lines, using different buffers. *Mov Disord.* **2016**; 31 (suppl 2). http://www.mdsabstracts.org/abstract/diverse-effects-of-alpha-synuclein-fibrils-on-various-neuron-cell-lines-using-different-buffers/
12. **Farhang Aliakbari**, Dina Morshedi, Ali Akbar Shabani, Hassan Bardania, Carolyn Sue, Amir Tayaranian Marvian, Seyed Abbas Shojaosadati, and Ali Akbar Saboury. "The effects of different concentrations of nanoliposome on the fibrillation of alpha-synuclein." **2016.** In MOVEMENT DISORDERS, vol. 31, pp. S61-S62. 111 RIVER ST, HOBOKEN 07030-5774, NJ USA: WILEY-BLACKWELL. https://insights.ovid.com/movement-disorders/mdis/2016/03/001/effects-different-concentrations-nanoliposome/115/01445483
13. A.T. Marvian, D. Morshedi, **F. Aliakbari**, H. Ghapani, M. Nasuti. Characteristics of the interaction between different toxic aggregated species of alpha-synuclein and cell membrane. *Mov Disord.* **2016**; 31 (suppl 2). http://www.mdsabstracts.org/abstract/characteristics-of-the-interaction-between-different-toxic-aggregated-species-of-alpha-synuclein-and-cell-membrane/
14. **Farhang Aliakbari**, Dina Morshedi, Ali. Akbar Shabani, Hossein Mohammad Beigi, Hassan Bardania, Amir Tayaranian Marvian, Ali Akbar Saboury, Seyed Abbas Shojaosadati. Neurotoxicity of pre-incubated alpha-

synuclein with different concentrations of nanoliposome on the PC12 and SHSY5Y cell lines. International Congress on Nanostructures ICNS6. 7th-10th March, **2016,** PP: 90-91, **Kish Island, Iran.**

15. **Farhang Aliakbari**, Dina Morshedi, Ali. Akbar Shabani, Hossein Mohammad Beigi, Amir Tayaranian Marvian, Seyed Abbas Shojaosadati, Ali Akbar Saboury. Alternative response of PC12 and SHSY5Y cell lines on the toxic aggregated- Alpha-synuclein. 4th International Basic and Clinical Neuroscience Congress. 23h-25th December **2015,** ID: 26647, PP 122-123. **Tehran, Iran.**
16. **Farhang Aliakbari**, Hassan Bardania, Dina Morshedi, Ali. Akbar Shabani, Hossein Mohammad Beigi, Amir Tayaranian Marvian, Ali Akbar Saboury, Seyed Abbas Shojaosadati. Neurotoxicity of neutral charge nanoliposome as a candidate in order to drug delivery on the SHSY5Y and PC12 cell line. 14th Iranian Pharmaceutical Congresses and 1st Symposium on Biopharmaceutics and Pharmacokinetics. 21h-24th December **2015. Tehran, Iran.**
17. **Farhang Aliakbari**, Dina Morshedi. The impact of *Myrtus communis* essential oil to increase the formation of the toxic aggregate species of alpha-synuclein and enhancement of the cell death. Alpha-Synuclein: The Gateway to Parkinsonism. 11th-13th February **2014**. Session 5, No. 45, **Innsbruck, Austria.** http://www.movementdisorders.org/MDS-Files1/Education/PDFs/Alphasynuclein-Innsbruck/ConferenceSyllabusSYNMeetingIBKFLASHDRIVE.pdf
18. **Farhang Aliakbari,** Dina Morshedi, Amir Tayaranian Marvian, Mohsen Doostkam. Comparison of Cuminaldehyde with Baicalein in fibril formation and fibril decomposition of alpha-synuclein and the assessment of its cytotoxicity on PC12 cells. Conference "RNA Metabolism: Changing Paradigms in Neurodegeneration" **2014**, PP.42, May 26-29, **Trieste, Italy.**
19. Masoome Khalife, Dina Morshedi, **Farhang Aliakbari,** Hossein Mohammad Beigi, The presence of the fibrillar form of alpha-synuclein moderate dopamine cytotoxicity. Conference "RNA Metabolism: Changing Paradigms in Neurodegeneration" **2014.** PP.38, May 26-29, Trieste, Italy.
20. Amir Tayaranian Marvian, Dina Morshedi, **Farhang Aliakbari**. The study on the effect of fibrillation inhibitory compounds on the depolymerization of amyloid fibrils of alpha-synuclein using fluorescent-labeled protein. European Human Genetics Conference. **2014.** Volume 22 Supplement 1. No. J09.60. May 31- June 3, nature publishing group. **Milan, Italy.**
21. Mohsen Doostkam, Ayyoob Arpanaei, Dina Morshedi, **Farhang Aliakbari**, Hossein Mohammad Beigi. Preparation and characterization of baicalein-loaded mesoporous silica nanoparticles. 5th International Congress on Nanoscience and Nanotechnology. PP, 57. October 22-24, 2014. Tehran, Iran.
22. Negar Mirzazadeh, Abbas Shojaossadati, Dina Morshedi, Hossein Mohammad Beigi, **Farhang Aliakbari**. Effect of Human Serum Albumin Nanoparticles on α-synuclein fibrillation. 5th International Congress on Nanoscience and Nanotechnology. PP, 117. October 22-24, 2014. Tehran, Iran.
23. Fatemeh Omrani, Dina Morshedi, **Farhang Aliakbari**. Different sources of protaneous nanofibrils with different potential to bioremediation of dyes. 5th International Congress on Nanoscience and Nanotechnology. PP, 154. October 22-24, 2014. Tehran, Iran.
24. Masoome Khalife, Dina Morshedi, **Farhang Aliakbari,** Amir Tayaranian Marvian. Controversial role of amyloid form of alpha-synuclein on PC12 cells treated with dopamine. 2nd Neurosciences Congress, Basic and Clinical, **2013,** December 18-20, PP: 695-696, **Tehran, Iran.**
25. **Farhang Aliakbari**, Dina Morshedi. The Effect of *Lavandula officinalis* on the Amyloid Fibril Formation of Alpha-synuclein and Evaluation of the Cytotoxicity on SK-N-MC Cells. The 11th International Conference on Alzheimer's and Parkinson's Diseases, AD/PD™. **2013**. March 6-10, A-459-0002-01432. **Florence, Italy.**

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27. Masoome Khalife, Dina Morshedi, **Farhang Aliakbari,** Amir Tayaranian Marvian. Controversial role of amyloid form of alpha-synuclein on PC12 cells treated with dopamine. 2nd Neurosciences Congress, Basic and Clinical, December 18-20, **2013**, PP: 695-696, **Tehran, Iran.**

28. Masoome Khalife, Dina Morshedi, **Farhang Aliakbari**, Amir Tayaranian, Hossein Mohammad Beigi. The effect of dopamine in induction of Alpha synuclein cytotoxicity (involved protein in Parkinsons') by assessment of ROS and cell death. The 8th National Biotechnology Congress of Iran and the 4th Congress on Biosafety and Genetic Engineering. **2013**. July 6-8, **Tehran, Iran.** Dina Morshedi, **Farhang Aliakbari**, Hossein Abarghooi, Fatemeh Omrani. High potential to decolorize the aqueous solution contain Direct violet 51 by the proteinaceous nanofibrils extract from wastes. Bioremediation, 2013, No, 1145. Hossein Mohammad Beigi, Seyed Abbas Shojaosadati, Dina Morshedi, **Farhang Aliakbari,** The inhibitory effects of Galic acid on the Alpha-Synuclein amyloid fibrils. The 8th National Biotechnology Congress of Iran and the 4th Congress on Biosafety and Genetic Engineering. July 6-8, 2013 Tehran, Iran.
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30. Mona Soroush, Dina Morshedi, Sattar Tahmasebi Enferadi, **Farhang Aliakbari**. Study on the anti-amyloidogenic effect of herbal extraction which protect dopaminergic cells from damages of toxic forms of alpha-synuclein amyloid fibrils. 2nd Neurosciences Congress, Basic and Clinical, December 18-20, PP: 569, 2013, Tehran, Iran.
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39. Dina Morshedi, Jafar Fallahi, **Farhang Aliakbari**. Study on the effect of His-tag on the purification and fibrillation of recombinant alpha synuclein. The 17th national & 5th International Conference of Biology of Iran. Kerman, Iran. 2012. IBC17thP4173T002-2.

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42. Davoud Farajzadeh, Malak Farajzadeh, **Farhang Aliakbari**. Expression of the ACC deaminase from Pseudomonas fluorescens FY32 in Azotobacter vinelandii FY10 .2012. 15th International Biotechnology Symposium and Exhibition. Daegu, Korea.

43. Zeinab Mohammadi, Dina Morshedi, Masoud Mashhadi Akbar Boojar, **Farhang Aliakbari.** Elimination of Azo dye from aqua solution by protein nanofibrils. 1st National student Conference of Biotechnology. Gholestan, Iran. 2012. p:57

44. Tayyebali Salmani Kesejini, Dina Morshedi, **Farhang Aliakbari**. Inhibitory effect of essential oil belonging to cumin oil on lysozyme amyloid process. 2nd Research Congress of Medical Sciences students of Tehran's Network Partner. 2012. P:5.

45. Dina Morshedi, **Farhang Aliakbari**, Hamid Reza Noori. Study of dNTPs effect on alpha-synuclein fibril formation (Amyloidosis). 2nd National and the 1st International Congress on Cellular and Molecular Advanced in Non-Contagious Diseases. Cell Journal, **2011.** Vol 13, No:16. P:47. **Babol, Iran.** http://celljournal.org/journal/article/abstract/1586

46. Dina Morshedi, **Farhang Aliakbari**, Tayyebali Salmani Kesejini, Fatemeh Tabandeh. Inducing coagulation form by binding of Azo dyes to the amyloid structure of protein. 10th Iran Biophysical chemistry conference. **2011.** No:16. P:A8. **Shiraz, Iran.**

47. Tayyebali Salmani Kesejini, **Farhang Aliakbari,** Dina Morshedi. Study on cytotoxicity effects of different structures of Alpha synuclein fibrils on SK-N-MC cells. The 1st International and 5th Annual Congress of Iranian Neurogenetic Society. Tehran, Iran. 2011. No: 444. P:28.

48. Tayyebali Salmani Kesejini, Dina Morshedi, **Farhang Aliakbari.** Inhibition of Alpha synuclein fibrillation in the presence of plant extractions. The 1st International and 5th Annual Congress of Iranian Neurogenetic Society. Tehran, Iran. 2011. No: 445. P:66.

49. Dina Morshedi, **Farhang Aliakbari**, Tayyebali Salmani Kesejini, Coagulation of congo red (Azo Dye) by nanofibrils of different proteins. The 7th National Biotechnology Congress. Tehran, Iran. 2011.

50. Dina Morshedi, **Farhang Aliakbari**, Tayyebali Salmani Kesejini, Neda Vaseli Hagh, Abdololkhalegh Dizagee. High Production of recombinant alpha-synuclein and in vivo study on cytotoxicity effects of amyloid forms of synuclein (Parkinson's disease related protein). **2010.** 4th Iranian Neurogenetic Society Annual Congress. Tehran, Iran. No: P08. P: 122. **Tehran, Iran.**

51. Dina Morshedi, Tayyebali Salmani Kesejini, **Farhang Aliakbari**. Cumin oil as an inhibitor to inhibit protein fibrillation. **2010.** 4th Iranian Neurogenetic Society Annual Congress. No: P07. P:121. **Tehran, Iran.**
52. **Farhang Aliakbari**, Seyedeh Flour Mazhar, Rouhollah Karami-osboo, Parvin Shariati, Davood Faradjzadeh, Dina Morshedi. Essential oils usage as a natural pesticide. 14th International Biotechnology Symposium and Exhibition. **2010.** P-P&F028. **Rimini, Italy.**
53. Dina Morshedi, **Farhang Aliakbari**, Hassan Habib Ghomi, Mohsen Nemat Ghorghani. Adding glucoseamine sulfate induces high production of alpha synuclein in *E coli* BL21. 14th International Biotechnology Symposium and Exhibition. **2010.** P-I.58. **Rimini, Italy.** http://www.sciencedirect.com/science/article/pii/S0168165610013313
54. **Farhang Aliakbari,** Meisam Moradi, Majid Lotfinia, Parvin Shariati, Dina Morshedi, Sadegh Azimzadeh Jamalkandi. Similarity of the lipopeptide antibiotic iturin A protein in *Bacillus* species. **2010.** 11th Iran Genetic Congress. P4 - 010, 2010. **Tehran, Iran.**
55. **Farhang Aliakbari**, Meisam Moradi, Majid Lotfinia, Seyedeh Flour Mazhar, Parvin Shariati, Sadegh Azimzadeh Jamalkandi. Comparison of the *IturinA* Operon in *Bacillus* Species. The 3rd Iranian conference on Bioinformatics. **2010.** ID: 217. P:124. **Tehran, Iran.**
56. Meisam Moradi, Parvin Shariati, Fatemeh Tabandeh, Zahra Mirzaee Zadeh, **Farhang Aliakbari.** Comparison of the Alpha-Amylase Proteins from Several Amylolytic Microbial Strains. The 3rd Iranian conference on Bioinformatics. Tehran, Iran. 2010. ID: 208. P:122.
57. Moradi Meisam, Parvin Shariati, Fatemeh Tabandeh, **Farhang Aliakbari.** 2010. Comparison of protein sequences and conserved regions in extracellular pullulanase enzymes from two different bacteria genera. 11th Iran Genetic Congress. Tehran, Iran. O4 - 013, 2010.
58. **Farhang Aliakbari**, Seyedeh Flour Mazhar, Rouhollah Karami-osboo. The influence of *Mentha polegium*, *Lavandula officinalis* and *Thyme* essential oils on *Fusarium graminearum*. 10th Arab Congress of Plant Protection. **2009.** Abstract No: 012. P: 124. **Beirut, Lebanon.**
59. Seyedeh Flour Mazhar, **Farhang Aliakbari ,** Rouhollah Karami-osboo. The effect of Essential oils belonging to *Mentha viridis L.*, *Saturiea hortensis* and *Cuminum cyminum*, on the growth of *Fusarium graminearum*. 10th Arab Congress of Plant Protection. Beirut, Lebanon. 2009. Abstract No: 013. P: E121.
60. Rouhollah Karami-osboo, Seyedeh Flour Mazhar, **Farhang Aliakbari**. Decontamination of wheat kernels inoculated with *Fusarium graminearum* by *Cuminum cyminum*, *Saturiea hortensis* and *Mentha viridis L.* (*spearmint*). 10th Arab Congress of Plant Protection. Beirut, Lebanon. 2009. Abstract No: 103. P: E153.
61. **Farhang Aliakbari**, Seyedeh Flour Mazhar, Rouhollah Karami-osboo, Parvin Shariati. 2009. Decontamination of maize artificially inoculated with *Fusarium verticillioides* with *Mentha polegium*, *Mentha viridis* and *Saturiea hortensis* essential oils. International Society for Mycotoxin. **2009.** Poster No: 047. P:72. **Tulln/Vienna, Austria.**
62. Seyedeh Flour Mazhar, **Farhang Aliakbari**, Rouhollah Karami-osboo, Parvin Shariati. Antifungal treatment of *Cuminum cyminum*, *Saturiea hortensis* and *Mentha viridis* essential oils on *Fusarium verticillioides*. International Society for Mycotoxin. **2009.** Poster No: 024. P:49. **Tulln/Vienna, Austria.**
63. Seyedeh Flour Mazhar, **Farhang Aliakbari**, Isolation and Identification from oil black mud and liquid oil. 10th Iranian congress of Microbiology. Ilam, Iran. Poster No:269, P:290.
64. Seyedeh Flour Mazhar, **Farhang Aliakbari**, Elimination of oil contamination by community of bacteria. 10th Iranian congress of Microbiology. Ilam, Iran. Poster No:274, P:295.
65. **Farhang Aliakbari**, Seyedeh Flour Mazhar, Rouhollah Karami-osboo. Inhibitory effect of *Thymus vulgaris* and *Saturiea hortensis* essential oils against *Salmonella* Spp., 2nd International Student Conference of Biotechnology. **2008.** P: 125. **Tehran, Iran.**

66. Seyedeh Flour Mazhar, **Farhang Aliakbari**, Rouhollah Karami-osboo. Decontamination of raw chicken inoculated with *salmonella* spp. with *thymus vulgaris* and *Saturiea hortensis* essential oils. 2nd International Student Conference of Biotechnology. **2008.** P: 126. **Tehran, Iran.**
67. Rouhollah Karami-Osboo, **Farhang Aliakbari**, Seyedeh Flour Mazhar. Antimicrobial effect of *Saturiea hortensis* and *Thyme* essential oils against *Shigella* spp. *2nd International Student Conference of Biotechnology*. Tehran, Iran. 2008. P: 127.
68. Seyedeh Flour Mazhar, **Farhang Aliakbari**, Rouhollah Karami-osboo. The influence of *Saturiea hortensis*, *Mentha piperita* and *thymus vulgaris* essential oils toward *Fusarium verticillioides.* 18th congress of Plant Pathology. Karaj. Iran. 2008. p: 325.

Research Grants:

1. **Research Grant Recipient** - *Development and assessment of an iLAMP-based aptasensor for early diagnosis of Alzheimer's and Parkinson's neurodegenerative diseases*; funded by the National Institute of Genetic Engineering and Biotechnology (NIGEB) and the Ministry of Science, Research and Technology of Iran (2024).
2. **Research Grant Recipient** - *Investigating the polyphenolic compounds of rose flower extract on the aggregated species of amyloid-beta peptide and its cytotoxicity in Alzheimer's disease*; funded by the National Institute of Genetic Engineering and Biotechnology (NIGEB) (2024).
3. **Research Grant Recipient** - *Investigating the effects of a nanobubble-containing drug hybrid with mesenchymal stem cell-derived exosomes on amyloid-beta aggregation and neurotoxicity in Alzheimer's disease*; funded by the Iran National Science Foundation (INSF) (2024).
4. **Research Grant Recipient** - *Enhancement of the performance of engineered mesenchymal stem cell-derived exosomes in crossing the blood-brain barrier, inhibiting toxic alpha-synuclein aggregation, and preventing neuronal death in a Parkinson's disease model using aptamers and bioactive compounds with nanobubble technology and focused ultrasound*; funded by the Center for International Scientific Studies and Collaboration (CISSC) (2025).

Research experience:

- **2022:** Evaluating the mechanism of tau transferring from cell to cell and through the brain to the spinal cord mediated by exosomes.
- University of Western Ontario, Canada, 2022-on going.
- **2020:** The effects of mesenchymal stem cell–derived exosomes hybrid to nanoliposomes-incorporated anti-neurotoxin drug on the degeneration and regeneration of neurons.
- **2016-2019:** The impact of baicalein incorporated liposomal nanosystems on the fibrillation of alpha-synuclein and neurotoxicity.
- **2015:** Formulation of liposomal nanosystems and evaluation of their impact on the fibrillation of alpha-synuclein and neurotoxicity.
- **2014-2015:** Making a mouse model by injecting the α-synuclein into the mouse brain to assess the pathology form of such a protein.
- **2014-2015:** Making a cell model by overexpression of α-synuclein in SHSY5Y cell line.
- **2012-2014:** Design, fabrication and application of mesoporous silica nanoparticles for controlled-release of cuminaldehyde and prevention of α-synuclein amyloid formation.

- **2011-2013:** Using proteinaceous nanofibrils to remove azo dyes from its aqueous solution.
- **2010-2012:** Studying the effects of herbal medicine essential oils belonging to *Lavandula officinalis* and *Cuminum cyminum* on the amyloid formation of α-synuclein protein and assessment of their inhibition mechanism on cytotoxicity *in vitro*.
- **2008- 2010**: Induction of α-synuclein nanofibrils and studies on the effects of some chemical chaperons on the fibrillization process *in vitro*.

Honors & Awards:

- Receiving a **Travel Bursary to** attend the **"International Congress of Parkinson's Disease and Movement**", **Nice, France**, September 22 – 26, **2019.**
- Selected as a **Top student researcher** at Semnan University of Medical Sciences, Semnan, Iran. **2017.**
- Selected as a **Top student researcher of the medical school** at Semnan University of Medical Sciences, Semnan, Iran. **2016.**
- Receiving a **Travel Bursary to** attend the **"20th International Congress of Parkinson's Disease and Movement**", **Berlin, Germany**, June 19-23, **2016.**
- Receiving a **Grant award to travel** and participate in the **"Alpha synuclein: The Gateway to Parkinsonism" course** in **Innsbruck, Austria**, 11-13 February, **2015**.
- Receiving a **Grant for participating** in a course that was organized by International Center for Genetic Engineering and Biotechnology (ICGEB) entitled: **"RNA Metabolism: Changing Paradigms in Neurodegeneration"** Held on 26-29 May **2014, Trieste, Italy.**
- Selected as a **First rank between all PhD students** at Semnan University of Medical Sciences, Semnan, Iran, **2013.**
- Selected as a **Top expert** at National Institute of Genetic Engineering and Biotechnology (NIGEB), Tehran, Iran. **2013**.

Work experience:

- **Since 2024 till now:** Full-time Professor Assistant at Department of Bioprocess Engineering, National Institute of Genetic Engineering and Biotechnology (NIGEB), Tehran, Iran.
- **Since 2022 till 2024:** Full-time Postdoctoral Fellow at Robarts Research Institute, University of Western Ontario, Canada, 2022-2024.
- **Since 2021 till 2022:** Full-time Postdoctoral Fellow at Department of Industrial & Environmental Biotechnology, National Institute of Genetic Engineering and Biotechnology (NIGEB), Tehran, Iran.
- **Since 2008 till 2021:** Full-time Research Assistant at Department of Industrial & Environmental Biotechnology, National Institute of Genetic Engineering and Biotechnology (NIGEB), Tehran, Iran.
- **February-May 2017:** Research guest at Interdisciplinary Nanoscience Center (iNANO) Aarhus University, Aarhus, Denmark.
- **2007-2008:** Laboratory technician/ Expert at Faroogh Life Sciences Research Lab. Tehran, Iran.

Teaching experience:

- **2024-2025:** Lecturer of Genetic Engineering and Molecular Biotechnology, at the Master of Science level to students at National Institute of Genetic Engineering and Biotechnology, Tehran, Iran.
- **2024-2025:** Lecturer of Prokaryotic Genetic Engineering, at the Master of Science level to students at National Institute of Genetic Engineering and Biotechnology, Tehran, Iran.

- **2014-2015:** Lecturer of cell/tissue culture methods, Cytogenetics and Human Genetics courses at the Master of Science level to students at Azad University, Damghan Branch, Damghan, Iran.
- **2007-2009:** Lecturer of Cellular and Molecular Biology, Molecular Genetic, General Biochemistry, General Microbiology, Immunology Lab., Nutrition Microbiology Lab., courses at the Bachelor of Science level to students at Azad University, Damghan Branch. Damghan, Iran.
- **2006-2007:** English Language instructor, Deneshvar private English Institute, Tehran. Iran .

Patents:

1. Narges Nasrollahi Boroujeni, Dina Morshedi, **Farhang Aliakbari:** Bi-Layer nanobubbles and method for their synthesis for targeted drug delivery, using focused ultrasound **2024** (PCT/IB2024/055258).
2. Dina Morshedi, Narges Nasrollahi Boroujeni, **Farhang Aliakbari**: The process of making nanobubbles based on stable gas and loading drugs inside it for targeted drug delivery with focused ultrasound. **2023**. 1402/03/09- 14025014003001549. **Tehran, Iran.**
3. Dina Morshedi, **Farhang Aliakbari**, Jafar Fallahi, Purification of Alpha synuclein with no tag using properties of salt chelating. **2013**. No. 1393/02/02-82700. **Tehran, Iran.**
4. Dina Morshedi, **Farhang Aliakbari**, Producing recombinant Alpha synuclein (related protein with Parkinson's Diseases) using a native and economical carbon source. **2011**. No. 1390/05/11-70923. **Tehran, Iran.**
5. Seyedeh Flour Mazhar, **Farhang Aliakbari**, Rouhollah Karami-Osboo. Usage of *Saturiea hortensis* and *Mentha polegium* at low concentrations as a food preservative. **2009** No. 1388/05/18-60418. **Tehran, Iran.**
6. Dina Morshedi, Narges Nasrollahi Boroujeni, **Farhang Aliakbari.** The process of making nanobubbles based on stable gas and loading drugs inside it for targeted drug delivery with focused ultrasound. **2023.** No.14025014003001549 **Tehran, Iran.**

Books :

1. **Farhang Aliakbari**, Seyedeh Flour Mazhar. **2013**. **"Review of Microbiology"** in Persian language. Varan Press.
2. Dina Morshedi, Fatemeh Rahimi, Hossein Mohammad-Begi, **Farhang Aliakbari**, Fatemeh Mirzadeh, **2019. "Protein Nanotechnology (translation"),** National institute of Genetic Engineering and Biotechnology press.

Selected Technical Skills:

I) Cellular Biology:

- General Cell culture, freezing and thawing, Cell cytotoxicity including Flow cytometry, MTT assay, Trypan blue, Methylene green, Necrosis, and Cell mediated cytotoxicity, Apoptosis tests: contains Annexin V/PI, DNA Ladder, LDH, DNA Fragmentation, ROS, Fluorescence Microscopy, Immunocytochemistry and Immunohistochemistry, Blood sampling from Humans, -Hemagglutination assay (HA)

(II) Molecular Biology:

Bioinformatics: Most essential database in molecular biology such as NCBI, Expasy, etc., multiple alignments using DNA/Protein Blast, Clustalw, Mega, etc., Design of Primers using Oligo, Primer3, Gene runner, etc., DNA construct design using Editseq, SeqBuilder, , etc., codon optimization and protein expression optimization

Genetic engineering and Molecular cloning: CRISPR-Cas technology, DNA/RNA Isolation from different microorganisms/organisms & quantification, PCR techniques including RT-PCR, colony PCR, & Real time PCR,

Plasmid extraction & quantification, Gene cloning (Competent cell preparation, Transformation, Digestion, Ligation), cDNA synthesis, Lentiviral packaging and Transfection as well as infection, Electrophoresis (Agarose and SDS-PAGE),

Heterologous protein expression: In *E.coli* expression system (at small and large scales), Overexpression optimization in *E.coli in vivo* to reach most volume of active protein at soluble phase, Inclusion bodies preparation and refolding

Protein: Protein extraction using both chemical and mechanical methods, Affinity chromatograph, Gel filtration, Micro & Ultra filtration, Ion exchange chromatography, Ammonium sulphate precipitation, SDS-PAGE and native PAGE, silver staining, Bradford protein assay, Biochemical assays: Western blotting, Thin Layer Chromatography (TLC), Protein fibril formation, Spectroscopy (CD and Fluorescence), Enzyme assay, Atomic force Microscopy

***(III) Microbiology*:** Microbial culture, Biological and biochemical tests, Serology and Immunology experiments including ElISA, Microprecipitation test, etc.

***(IV) Working with laboratory animals*:** Working with laboratory animals, especially mice, Stereotaxic surgery of mouse.

***(V) Others*:** To be familiar with Next Generation Sequencing, Fermentor, HPLC, TLC, Southern Blotting, Taghuchi software for optimization.

Training courses /workshop attendance:

- Certified in workshop entitled: "**Genom Editing, CRISPR Cas-9 System"**. Held in **National institute of Genetic Engineering and Biotechnology**, on 5-7 March, **2018**, Tehran. **Iran**.
- Certified in workshop entitled: "**miRNA sequencing data analysis"**. Held in **Pasteur Institute**, 24-25 January, **2018**. Tehran. **Iran**.
- Certified in workshop entitled: "**mRNA sequencing data analysis"**. Held in **Pasteur Institute**, **2018**. Tehran. **Iran**.
- Certified in symposium entitled: "**CRISPR Cas-9 and its software"**. Held in **National institute of Genetic Engineering and Biotechnology**, **2017**. Tehran. **Iran**.
- Certified in the course entitled: **"RNA Metabolism: Changing Paradigms in Neurodegeneration"** organized by **International Center for Genetic Engineering and Biotechnology (ICGEB)**, Held on 26-29 May **2014**, Trieste, **Italy**.
- Certified in summer school and workshops entitled: **"Principal of animal cell culture, Expansion of induced pluripotent stem cell (iPS), Lentiviral gene packaging and transduction of iPS, Gene transfer by pronuclear microinjection, Nano-structure scaffold preparation and stem cell culture"**, Held in **Stem Cell Technology Research Center**, **2014**. Tehran, **Iran**.
- Certified in workshop entitled: "**Embryonic and adult Stem Cell culture"**. Held in **National institute of Genetic Engineering and Biotechnology**, **2011**. Tehran. **Iran**.
- Certified in workshop entitled: "**Gene transfection to the mesanchymal Stem cell using lenity viruses vectors**". Held in **National institute of Genetic Engineering and Biotechnology**, **2010**. Tehran. **Iran**.