

In the name of God
Curriculum Vita



Behrokh Farahmand

Ph.D in Molecular Genetic

(Assistant Proffessor)

Influenza and other Respiratory Viruses

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Education:

PhD (molecular genetic):NIGEB.

M.Sc(Biochemistry):Tarbiat Modarres university of Tehran IRAN

B.Sc(Chemistry): Tarbiat Moallem university of Tehran IRAN

scientific societies:

Iranian Biochemical Society (21314)

American Biochemical Society (ASBMB with 16682M)

Iranian Genegtic Society

Iranian biotechnology Society

Employment History:

Assistant proffesor in Institute pasteur (2012-up to now)

Lab Instructor in Institute pasteur (1997-2011)

Lab Instructor in Behzisty University of Tehran IRAN (1994-1996)

Lab Instructor in Pharmaceutical Faculty of Azad university of Tehran IRAN (1989-1991)

Research project director:

- Production and protectivity assessment of intranasal administration of polyclonal Antibodies against whole Influenza A/H1N1virus and conserved proteins (HA2& M2) in mice (no:944)
- Evaluation of the susceptibility to influenza virus in people suffering from Hypercholesterolemia and diabetes in terms of IFITM3 polymorphism rs12252-C(no:831)
- Prokaryotic production and Immunogenicity assessment of chimer Protein consisting of Influenza Virus conserved Domains of Hemagglutinin and Matrix proteins (3M2e-HA2) in mouse model. "2014-2016" (no:759)
- synthesis and Lab scale production of Sucrose monolaurate glycoester as a safe Biosurfactant . "2014-2016" (no: f13)
- Suspending MDCK cell line for large scale culture of influenza virus "2012-2014" (no:606)

Research project co-worker:

- Evaluation of protective and anti-influenza immunity of influenza virosome potency as carrier of plasmid expressing influenza M2 gene and GM-CSF as genetic adjuvant in BALB/c mice model "2018-2020"(no:)
- Expression of Hemagglutinin (HA) proteins in Tobacco plant for production of virus-like particles as vaccine candidate "2017-2019"(no:6036).
- Application of avian Newcastle disease virus (NDV) in combination with influenza hemagglutinin Fusogenic membrane glycoproteins (FMGs) gene as novel therapy for murine model of human papillomavirus –induced cancer "2017-2019"(no:)
- Formulation of oil adjuvant with capability to inducing TH1 immune responses "2017-2018"
- Production of influenza virus M2 protein, Leshmania Major HSP70 and M2- HSP chimeric protein in prokaryotic system (E. coli) and assessment of its immunogenicity in mice. "2012-2014" (no:611)
- Virosome construction from Influenza virus to include Nucleoprotein gene as DNA vaccine against the virus. . "2014-2016" (no:762)

- Construction of a chimerical expression vector carrying influenza virus M₂ protein and HSP70 gene and protein expression in COS-7 and/or HEK 293 cells “2009-2010” (no:459)
- Expression of Human Influenza Hemagglutinin in BES (Baculovirus Expression system) for subunit vaccine production “2007-2010”(no:415)
- Immunogenicity of liposome containing influenza nucleocapsid protein and envelope glycoproteins; Vaccine developmental approach “2005”(no:280)
- Standardization of Islet cell isolation and purification for transplantation in diabetic mice. “2001-2003”.
- Evaluation of *Plasmodium Falciparum* protease to design inhibitor “1999-2001”(no:140).
- Extraction and purification of (NAD)H by *Saccaromyces Cervisiae PTCC 5080* “1998-2000”(no:115).
- Purification of the delta-endotoxin and cytolytic proteins of *Bacillus Thuringiensis* Subsp H14 Israelensis and Inspection of toxin effect in Rat cell. “1998-2000”(no:180).
- Rapid test for morphine analysis in urine. “ 2002-2005” (no:1460).

Teaching & Advising:

- Molecular Biology
- Bioinformatic tools in protein vaccine design
- General Virology
- Protein Biochemistry
- General Biochemistry
- Nanotechnology

Thesis supervisor:

- Design, Production and protectivity assessment of intranasal administration of peptide derived antibody C05 against Influenza A virus Hemagglutinin protein in mice model(2019-2021)(PhD student: Shima Gholami)
- Construction of a Chimeric subunit vaccine consisting of HA2 and NP influenza A virus conserved proteins and immunogenicity assessment using MF59 as adjuvant in animal model(2018-2020))(PhD student: Fatemeh Karimi)
- Production of a subunit vaccine cocktail containing influenza virus conserved proteins and immunogenicity assessment using sucrose ester as adjuvant in animal model(2017-2020))(PhD student: Ali Torabi)
- Cloning& expression of influenza virus A/H1N1 hemagglutinin conserve domain (HA2) & nucleoprotein (NP) gene casset in *Escherichia coli*(E. coli) (2016-2017)(student: Fatemeh Morshedi)
- Purification of Influenza A (H1N1) Nucleoprotein and preparation of its Polyclonal Antibody in Rabbits(2016-2017)(student: Mehdi Alikhani)
- Polyclonal antibody Production against HA1 recombinant proteins(2015-2016)(student:Fatemeh Khosravi)
- Design, construction and expression of tri-fusion protein consist of Nucleoprotein(NP), hemagglutinin conserved domain(HA2) and three copy number

- of matrix protein2 ectodomain (3M2e) of influenza virus A(H1N1) in prokaryotic system (*E. coli*)(2014-2015)(student: Shekoofeh Hatami)
- Construction & expression gene cassette of influenza virus A/H1N1 hemagglutinin conserve domain (HA2) & triplet matrix protein 2 ectodomain (3M2e) & Leishmania major HSP70 as fusion protein in *Escherichia coli*(*E. coli*)(2014-2015)(student: Elahe Nazeri)
 - Polyclonal antibody Production against HA2 & M2 recombinant proteins in order to serological methods for influenza virus detection(2013-2014) (student:Somayeh Zamani)
 - Cloning & expression of influenza virus hemagglutinin small subunit (HA2) protein in *E. coli* (2012-2013)(student: Atieh Akbari)
 - Construction & expression of influenza virus A/H1N1 hemagglutinin small subunit (HA2) & triplet matrix protein 2 ectodomain (3M2e) as fusion protein in *E. coli* (2012-2013)(student: Neda Jalili)

Thesis advisor:

- Prokaryotic production of chimeric proteins containing conserved regions of hemagglutinin, matrix protein and nucleoprotein influenza virus (A / H1N1) and its immunogenicity in a mouse model(2017-2019)
- Evaluation the relation between the physiological adverse effects of high doses of tramadol with Gene polymorphism cytochrome P450 Enzymes (CYP)(2017-2018)
- Phylogenetic and molecular analysis of genomic HA1(Hemagglutinin) fragment in influenza A(H3N2) virus isolated from Iranian patients (2017-2018)
- Immunological studies of HIV-1 Tat-Nef antigen in two recombinant protein and DNA construct modalities in Balb/c mice model (2015)
- Gene isolation and cloning of ST6GalNAc V (sial7e) derived from human brain tumor tissue (Dec 2013)
- Extraction and cloning of a human st6GalNAc V from breast cancer cell line (Dec 2013)
- Determination of glycosylation composition in influenza virus Hemagglutinin glycoprotein (Aug 2009)
- Biochemical study of standard method of islet cells isolation and purification for treatment of streptozotocine - induced Diabetic rats by transplantation(Mar 2004)

Training Course:

- Acquaintance with concept of Industrial Microbiology in Iranian Research Organization of Science and Technology
- Amino acid analysis of peptides and proteins (electronic course work) in Pasteur Institute
- Two dimensional electrophoresis and its applications in proteomics (electronic course work) in Pasteur Institute
- Bioinformatic workshop(2014)

- Immunoinformatic workshop(2014)
- DNAsis Max workshop
- fermentation workshop

Reviewer for journals:

- Joundishapoor Journal of Microbiology
- Iranian journal of biotechnology
- Medical journal of islamic republic of Iran
- Journal of general virology
- Iranian Journal of immunology
- Gastroenterology and Hepatology From Bed to Bench

Workshop performances:

- As scientific Manager of pasteur Institute of Iran Summer school from 2010-2018
- Contribution in pasteur Institute of Iran Summer school from 2010-2018 as lecturer On: (Bioinformatic tools in protein vaccine design, SDS-PAGE and Western Blotting)

Publications:

- Saleh M, Nowroozi M, Fotouhi F, **Farahmand B***. Physicochemical study of the influenza A virus M2 protein and alum adjuvant interaction as a vaccine candidate model. *Future virology* 2019; 14(8) 17 Sep 2019 <https://doi.org/10.2217/fvl-2019-0019>.
- **Behrokh Farahmand**, Najmeh Taheri, Hadiseh Shokouhi · Hoorieh Soleimanjahi, Fatemeh Fotouhi. Chimeric protein consisting of 3M2e and HSP as a universal influenza vaccine candidate: from in silico analysis to preliminary evaluation. Received: *Virus Genes* (2019) 55:22–32.
- Abbas Mohammadpour, Mahmood Dehghani Ashkezari, **Behrokh Farahmand**, Mohammad Shokrzadeh3. Demographic Characteristics and Functional Performance of the Kidneys and Hearts of Patients with Acute Tramadol Toxicity. *Drug Re; 2019 Apr;69(4):207-210*.

- Seyed Mostafa Jalili Kolour , Farida Behzadian, **Behrokh Farahmand** and Salimeh Raeisi. Design of a Universal Influenza A Vaccine Candidate Based on M2e.FliC; Immunoinformatics Analysis, Protein Modeling, and Its Expression in Escherichia coli. *Jundishapur Journal of Microbiology: November 2018, 11 (11); e66592.*
- Mohebbi, A., Fotouhi, F., Jamali, A., Yaghobi, R., **Farahmand, B.**, Mohebbi, R. Molecular epidemiology of the hemagglutinin gene of prevalent influenza virus A/H1N1/pdm09 among patient in Iran .(2018) *Virus Research, 259, pp. 38-45.*
- Elahe Nazeri, **Behrokh Farahmand***, Fatemeh Fotouhi, Mehrdad Hashemi, Najme Taheri,1 Hadis Shokohi, and Shekoofe Hatami. In Silico Analysis and Expression of Influenza Virus 3M2e-HA2 Chimer Protein Fused to C-Terminal Domain of Leishmania major HSP70. *Jundishapur J Microbiol. 2018 August; 11(8):e13777.*
- Parvaneh Mehrbod, Muna A. Abdalla, Emmanuel M. Njoya, Aroke S. Ahmed, Fatemeh Fotouhi, **Behrokh Farahmand**, Dorcas A. Gado, Mansoureh Tabatabaian, Olubunmi G. Fasanmi, Jacobus N. Eloff, Lyndy J. McGaw and Folorunso O. Fasina. South African medicinal plant extracts active against influenza A virus. *BMC Complementary and Alternative Medicine (2018) 18:112*
- Hadiseh Shokouhi, **Behrokh Farahmand**, Amir Ghaemi, Vahideh Mazaheri, Fatemeh Fotouhi. Vaccination with three tandem repeats of M2 extracellular domain fused to Leishmania major HSP70 protects mice against influenza A virus challenge. *Virus Research; 2018; (251) 40-46.*
- Zamani S, Fotouhi F, Mehrbod P, Sadeghi Neshat S, **Farahmand B***. Production and evaluation of polyclonal antibody against influenza A virus Matrix protein 2 conserved protein for research and diagnosis perpose. *Iranian Journal of Virology 2017;11(4): 31-38.*
- Hatami Sh, Fotouhi F, Hashemi M, Saleh M, Nazeri E ,Shokouhi H and **Farahmand B***. Prokaryotic expression of chimeric trimer protein (3M2e-HA2-NP) derived from conserved domains of influenza virus A/H1N1 as a promising universal subunit vaccine. *Scientific Journal of Kordistan University of medical sciences. 2018;20(91);111-120.*

- Parvaneh Mehrbod , Sana Eybpoosh , Fatemeh Fotouhi , Hadiseh Shokouhi Targhi , Vahideh Mazaheri and **Behrokh Farahmand*** . Association of IFITM3 rs12252 polymorphisms, BMI, diabetes, and hypercholesterolemia with mild flu in an Iranian population. *Virology Journal* (2017) 14:218.
- Fateme Khosravi Node ,Farida Behzadian ,Vahideh Mazaher ,Hadiseh Shokouhi ,Maryam Saleh and **Behrokh Farahmand***. Purification of Influenza virus A (H1N1) recombinant Hemagglutinin (HA1) and polyclonal antibody production. *Tehran University Medical Journal*, 2017;75(8); 585-592.
- Alikhani M, Behzadian F, Mehrbod P, Khosravi Node F, Shokouhi Taraghi H and **Farahmand B***. Polyclonal Antibody against Recombinant Nucleoprotein of the Influenza A Virus (H1N1); Production and Purification. *Iranian Journal of virology* 2017;11(2):36-42.
- FatemehFotouhi, Mina Shaffifar, **BehrokhFarahmand**, SadeghShirian, Mohsen Saeidi, AlijanTabarraei, Ali Gorji, Amir Ghaemi*, Adjuvant use of the NKT cell agonist alpha-galactosylceramide leads to enhancement of M2-based DNA vaccine immunogenicity and protective immunity against influenza A virus, *Arch Virol*, (2017) 162:1251–1260.
- Moeini S , Behzadian F , **Farahmand B**. Construction of chimeric protein 3M2e.FliC and its immunoinformatics analyses and expression in Bacillus subtilis. *Vaccine Research*. 2016;3(7); 12-17.
- **Farahmand.B***, Akbari A, Akbari Kh, Fotouhi F and Jalili N. Cloning, expression and purification of hemagglutinin conserved domain (HA2) of influenza A virus, to be used in broad-spectrum subunit vaccine cocktails. *Vaccine Research* ;2016: 3(8);69-75.
- HadisehShokouhi, Mohammad Reza Zolfaghari, **BehrokhFarahmand**, MansoorehTabatabaeian, NajmehTaheri, FatemehFotouhi. Immunological Assessment of Three Tandem Repeat of Influenza Virus M2 Extracellular Domain with Adjuvant in Balb/c Mice Model, *Arak Medical University Journal (AMUJ)* 2016; 19(106): 32-43
- Hatamihanza, H., Hashemi, M. , Akbarzadeh, A., Fotouhi, F., **Farahmand, B.**, Shahmabadi, H.E. Generation of truncated recombinant form of tumor necrosis factor receptor-1 to produce cancer vaccine . *Tropical Journal of Pharmaceutical Research*. Volume 15, Issue 11, November 2016, Pages 2345-2350.
- Jalili, N., Taheri, N., Tavakoli, R., Fotoohi, F., Akbari, A. **Farahmand, B.**, Expression and purification of a recombinant chimeric protein (3M2e-HA2) composed of influenza virus hemagglutinin and matrix protein conserved domain for

universal subunit vaccine development *Journal of Mazandaran University of Medical Sciences* **Volume 26, Issue 137, June 2016, Pages 12-22.**

- Mohammadzadeh, Y., Gholami, S., Rasouli, N., Sarrafzadeh, S., Seyed Tabib, N.S., Samiee Aref, M.H., Abdoli, A., Biglari, P., Fotouhi, F., **Farahmand, B.**, Tavassoti Kheiri, M., Jamali, A. Introduction of cationic virosome derived from vesicular stomatitis virus as a novel gene delivery system for sf9 cells. *Journal of Liposome Research* **10 March 2016, Pages 1-7.**
- Mehrbod P, Fotouhi F, IraniMokhtari G, **Farahmand B***. Comparison of Vero and MDCK cell lines transfected with human siat7 gene for conversion to suspension culture, *Vaccine Research*, 2015; 2(4): 69-73
- Neshat, S.S., **Farahmand, B.**, Kianmehr, Z., Zamani, S., Saleh, M., Fotouhi, F. Immunogenesis enhancement of influenza virus stalk domain using leishmania major heat shock protein, one step closer to universal vaccine. *Journal of Isfahan Medical School* **Volume 33, Issue 349, 1 November 2015, 12p.**
- Z. Kianmehr, S Ardestani, H.Soleimanjahi, **B.Farahmand**, A.Abdoli, M.Khatami, KH.Akbari and F. Fotouhi. An effective DNA priming-protein boosting approach for the cervical cancer vaccination. *FEMS pathogens and disease*, **73,2015,ftu012.**
- Somayeh Zamani, Fatemeh Fotouhi Chahouki, Zahra Nourmohammadi, Saeideh Sadeghi Neshat, Vahideh Mazaheri, Ali Torabi, **Behrokh Farahmand ***. Production of polyclonal antibody against Tehran strain influenza virus (A/H1N1/2009) hemagglutinin conserved domain (HA2). *Tehran University Medical Journal*, **August 2015; Vol. 73, No. 5: 535-539.**
- F. Fotouhi, **B.Farahmand**, B. Heydarchi, M. Esghaei, S. Rafati and MT. Kheiri. In vitro evaluation of influenza M2 and leishmania major HSP70(221-604) chimer protein. *Jundishapur J Microbiol* **7; (9);2014.**
- F. Fotouhi, S. chalabiani, M Saleh, M. Tabatabaian, **B.Farahmand**, MA. Alavi Esfahani, A. Torabi. Prokaryotic production of Influenza Virus M2 protein fused to Leishmania major HSP70 in order to prepare an effective flu vaccine. *Modares Journal of Medical Sciences: Pathobiology* **(has been accepted).**
- Y.Panahi, **B.Farahmand**, R.Soleimani-Estiar, R. Saghiri, SH. Fatahi, M. Tabatabaian and MT. Kheiri. Characterization of nucleoprotein extracted from human influenza A virus cultured in two different cell lines. *Iranian journal of virology*.**2013;7(1&2)51-6.**
- Z. Yosefi najafabadi, F. Behzadian, F. Fotouhi, **B. Farahmand**, M. Tat. Prokaryotic expression of influenza A virus nucleoprotein fused to mycobacterial heat shock protein 70. *Iranian journal of virology*.**2013;7(1&2)7-14.**

- A.Yosefi, F Fotouhi, S Hosseinzadeh, MT Kheiri, **B Farahmand**, S Montazeri, F Mousavi. Expression of antigenic determinants of the Hemagglutinin Large Subunit of novel Influenza Virus in Insect cells. *Folia Biologica.v:58,2012*.
- Seyedeh Fahime Mousavi, Fatemeh Fotouhi, Atena Yousefi, **Behrokh Frarahmand**, Behnaz Heydarchi, Rezvan Tavakoli, Masoumeh Tavassoti Kheiri. Isolation and full-length characterization of a novel Influenza Virus A hemagglutinin from 2009 pandemic Flu. *Iranian south medical journal. 2012*.
- Hossainzadeh S, Fotouhi F, **Farahmand B**, Saleh M, Yousefi A, Heydarchi B, Kheiri MT. Construction of recombinant bacmid DNA encoding influenza virus A(H1N1) hemagglutinin gene. *Modares, Vol. 14, No. 4, p37-47, Winter 2012*.
- Esghaei M, Monavari SH, Tavassoti-Kheiri M, Shamsi-Shahrabadi M, Heydarchi B, **Farahmand B**, Saleh M, Fotouhi F. Expression of the influenza M2 protein in three different eukaryotic cell lines. *J Virol Methods. 2012 Jan;179(1):161-5*.
- **Farahmand B**, Khodabandeh M, Mahboudi F, Fotouhi F, Saleh M, Barkhordari F, Tabatabaian M, Nasab FP, Kheiri MT. The Influenza Virus hemagglutinin: a model for protein N-glycosylation in recombinant *Escherichia coli*. *Intervirology journal, Vol. 55, No. 3, p219-244. February 2012*.
- **Farahmand B**, Khodabandeh M, Mahboudi F, Fotouhi F, Saleh M, Barkhordari F, Kheiri MT Isolation, cloning and sequencing of Influenza A(H1N1) hemagglutinin for hemagglutinin gene bank production. *Rahavard Danesh, May. 2010*.
- R. Nazari , A. Akbarzadeh, D. Norouzian, **B. Farahmand**, J. Vaez, A. Sadegi, F. Hormozi, M. Kiani-rad and B. Zarbakhsh. Applying intra-specific protoplast fusion in *Streptomyces griseoflavus* to increase the production of Desferrioxamine B. *Current science, vol. 88, No. 11, 10 june 2005*.
- Akbarzadeh Azim , Jamshidi Shirin, **Farahmand B**,.... Treatment of Streptozotocin induced diabetic male rats by immunoisolated transplantation of islet cells. *Scientific journal of Hamedan University of medical science & health services. Vol. 12, No. 3 Autumn 2005*.
- Norouzian D, Akbarzadeh A, Inanlou DN, **Farahmand B**, Salleh M, Sheikholeslami F, Vaez, J. Biotransformation of Alcohols to aldehydes by immobilized cells of *saccharomyces cerevisiae PTCC 5080*. Ref: *Enzyme and Microbial Technology 2003*.
- Sedigheh Javadpour, Dariush Norouzian, Azim Akbarzadeh, Saeed Mirdamadi and **Behrokh Farahmand**. Isolation of a penicillin Acylase Producing *E.coli* and kinetic Characterization of the whole cell Enzyme Activity. Ref: *Iranian Biomedical Journal 6(2&3): 93-96 (April & July 2002)*.
- Shamsi Yari, Davoud Nouri Inanlou, Fatemeh Yari, Maryam Saleh, **Behrokh Farahmand** and Azim Akbarzadeh. Effects of protoplast fusion on δ -endotoxin production in *Bacillus thuringiensis* SPP. (H14). *Iranian Biomedical Journal 6(1): 25-29 (Jan 2002)*.

- Azim Akbarzadeh, Dariush Norouzian, **Behrokh Farahmand** and Davoud Nouri Inanlou. Rapid Latex Agglutination Inhibition Reaction Test for morphine in urine. **Current Science** ,83,1,10 jul 2002.
- Azim akbarzadeh and **Behrokh Farahmand** .Diagnosis of 3-3-14 protein in spinal fluid of CJD patients. *Ref: Tashkhis (21) 2002.*
- Azim akbarzadeh, Dariush Norouzian, **Behrokh Farahmand**. Rapid Latex Agglutination Inhibition Reaction Test for morphine in urine. *ASRAR(Journal of Sabzevar School of Medical Sciences)2002.*
- Dariush Norouzian, Azim Akbarzadeh, Khosrow Rostami, Davoud Nouri Inanlou and **Behrokh Farahmand**. Evidence of Tryptophan at or near Active site of Glucoamylase I of *Arthrotrys amerospora*. Ref: *Iranian Biomedical Journals (384); 103-107 oct (1999).*
- **Farahmand B**, Rasae MJ, Maleknia N, Malekaneh M. Enzyme linked Immunosorbent assay of progesterone in serum using Penicillinase as label. Ref: *Iranian Biomedical Journal 2(384): 115-122 october (1998).*

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