

Curriculum Vitae (C.V.)

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Educational Background:

Diploma in Mathematics and Physics Sciences, Tehran, Iran

B.Sc. degree in Biology, Tehran University, Tehran, Iran

B.Sc. degree in Chemistry, Central Tehran University, Tehran, Iran

M.Sc. degree in Clinical Biochemistry, Tarbiat Modarres University, Tehran, Iran

Ph.D. degree in Clinical Biochemistry, Tarbiat Modarres University, Tehran, Iran

Post Doc in "Molecular Immunology and Vaccine Research" Laboratory, Pasteur Institute of Iran (IPI), Tehran, Iran

Current position: Associate Professor

H-index: 15

Thesis:

M.Sc. degree: "The *in vitro* study of the effect of Iranian Saffron components on DNA structure"

Ph.D. degree: "Cloning, expression and purification of HPV16E7 and heat shock 96 recombinant proteins for evaluation of their immuno-stimulatory potential in C57BL/6 mice model"

Research projects:

1. Effect of Hofmeister ions on H1 structure and H1-DNA interaction
2. Evaluation of immuno-stimulatory potential of HPV16E7 in the presence of GP96 in C57BL/6 mice model and determination of E7 antigenicity in patients suffering from papillomavirus infection
3. Evaluation of Tat-PEI nanoparticle effect in DNA vaccination using HPV16E7 in C57BL/6 mice model
4. Evaluation of VP22 of HSV-1 and its efficiency in DNA vaccination by fusing to Amastin of *L. major*
5. Contribution of human neutrophils in the development of protective immune responses during *in vitro Leishmania major* infection
6. Generation and characterization of a preventive and therapeutic HPV DNA vaccine using HPV16 E7 co-linked to GRP94 and chemokines
7. A live nonpathogenic *Leishmania* expressing selected immunodominant parasite antigens as a candidate vaccine against visceral leishmaniasis
8. Anti Leishmanial activity of human α -defensin-1 (HNP-1) and its contribution with CpG motif on infected human neutrophils
9. Production of different transgenic *Leishmania* strains expressing Green fluorescent protein (GFP) through homologous recombination into the chromosomal 18S rRNA locus of parasite

10. Production of a recombinant *Leishmania tarentolae* expressing HPV16 E7 gene and evaluation of its immunogenicity in C57BL/6 mice model
11. Design of recombinant non-pathogenic *Leishmania tarentolae* vaccines expressing HPV16 E7 linked to Gp96 and their immunostimulatory potential in C57BL/6 mice tumor model
12. Immunological efficacy study of whole recombinant killed *Pichia pastoris* and *Leishmania tarentolae* expressing HPV16 L1 capsid protein in C57BL/6 mice model
13. Cloning, expression and purification of recombinant HPV16 E7-CT (gp96) fusion protein for immunity evaluation of DNA vaccine in C57BL/6 tumor mice model
14. Immunological evaluation of *Leishmania tarentolae* expressing the HPV16E7 gene fused to NT-gp96 in C57BL/6 tumor mice model
15. Evaluation of therapeutic anti-tumor effects by combination of crocin treatment with therapeutic HPV DNA vaccination in C57BL/6 mice model
16. Evaluation of antitumor effects generated by DNA vaccine expressing HPV16 E7-NT (gp96) fusion protein along with crocin as a carotenoid in C57BL/6 mice model
17. Study of cytotoxic and apoptotic effects of crocin as a main carotenoid from Iranian saffron, in TC-1 tumor cells *in vitro*
18. Cloning, expression and purification of HPV16 L1 in prokaryotic expression system
19. Generation of virus-like particles in unicellular eukaryotic expression system (*Leishmania tarentolae*) as a HCV vaccine delivery system and its immunity in mice model
20. The production of recombinant camelids' nanobody against tat-pol-gag-env epitopes of HIV-1 using phage display technology
21. Synthesis and evaluation of novel Abacavir, Ritonavir and Zidovudine conjugated with Anionic liner globular dendimer as effective anti HIV-1 drugs

22. Construction of engineered Adenoviral vector for effective induction of anti-HIV-1 humoral immune response
 23. Generation of virus-like particles using a novel *leishmania* expression system for application of drug delivery systems and gene therapy
 24. Cloning of HPV16 L1-L2 fusion in eukaryotic vector for evaluation of protein expression in mammalian cell line *in vitro*
 25. Design of DNA vaccine expressing HIV MPER-V3 fusion protein and evaluation of its immunity in mice model
 26. Evaluation of Tat, PEP and CADY-mediated delivery of HIV-1 Nef recombinant protein into living cells and their immunological assays in mice model
 27. Development of a Chinese Hamster Ovary (CHO) into Stable cell line expressing the HIV Nef and Vpr genes and Evaluation of gene-specific siRNA inhibitory effects on HIV Nef and Vpr genes in these stable cell lines
 28. Immunogenicity evaluation of the recombinant MPER-V3 VLP for effective induction of anti-HIV-1 humoral immune response in BALB/c Mouse Model.

 29. Evaluation of Adjuvant activity of HMGB1 protein for enhancement of therapeutic DNA vaccine potency in mice model

 30. Generation of HMGB1 immunoadjuvant in eukaryotic expression system for therapeutic vaccine design against HPV16 infections and its evaluation in patients suffering from cervical cancer as a biomarker
 31. Preparation of mesenchymal stem cells expressing HIV-1 Nef using mechanical and chemical methods, and evaluation of its immunity in BALB/c mice model
 32. Efficiency assay of IMT-P8 and LDP12 cell penetrating peptides associated with Hsp27 and Hp91 endogenous adjuvants in mice immunization with HIV-1 Nef-MPER-V3 fusion protein
- Publications (articles and book chapter)**

1. Saleh T, **Bolhassani A**, Shojaosadati SA, Aghasadeghi MR. MPG-based nanoparticle: An efficient delivery system for enhancing the potency of DNA vaccine expressing HPV16E7. **Vaccine** 2015; 33(28):3164-70
2. Namvar A, **Bolhassani A**, Khairkhah N, Motevalli F. Physicochemical properties of polymers: An important system to overcome the cell barriers in gene transfection. **Biopolymers** 2015;103(7):363-75
3. Hosseinzadeh S, **Bolhassani A**. Immunostimulant Properties of Chemical Delivery Systems in Vaccine Development. **Curr Drug Deliv.** 2015
4. **Bolhassani A**. Cancer chemoprevention by natural carotenoids as an efficient strategy. **Anticancer Agents Med Chem.** 2015
5. Khavari A, **Bolhassani A**, Alizadeh F, Bathaie SZ, Balaram P, Agi E, Vahabpour R. Chemo-immunotherapy using saffron and its ingredients followed by E7-NT (gp96) DNA vaccine generates different anti-tumor effects against tumors expressing the E7 protein of human papillomavirus. **Arch Virol.** 2015 Feb;160(2):499-508
6. Aghasadeghi MR, Delbaz SA, Sadat SM, Siadat SD, Ardestani MS, Rahimi P, **Bolhassani A**, Roudsari RV, Bahramali G, Motevalli F, Davari M, Vakily H, Salmani AS, Nobari MB. Induction of Strong and Specific Humoral and T-helper 1 Cellular Responses by HBsAg Entrapped in the Methanobrevibacter smithii Archaeosomes. **Avicenna J Med Biotechnol.** 2014 Oct; 6(4): 238-245
7. **Bolhassani A**, Muller M, Roohvand F, Motevalli F, Agi E, Shokri M, Rad MM, Hosseinzadeh S. Whole recombinant Pichia pastoris expressing HPV16 L1 antigen is superior in inducing protection against tumor growth as compared to killed transgenic Leishmania. **Hum Vaccin Immunother.** 2014;10(12):3499-508

8. Alizadeh F, **Bolhassani A**, Khavari A, Bathaie SZ, Naji T, Bidgoli SA. Retinoids and their biological effects against cancer. **Int Immunopharmacol.** 2014
9. **Bolhassani A**, Khavari A, Bathaie SZ. Saffron and natural carotenoids: Biochemical activities and anti-tumor effects. **Biochim Biophys Acta: Reviews on Cancer;** 2014
10. Saljoughian N, Taheri T, Zahedifard F, Taslimi Y, Doustdari F, **Bolhassani A**, Doroud D, Azizi H, Heidari K, Vasei M, Namvar Asl N, Papadopoulou B, Rafati S. Development of novel prime-boost strategies based on a tri-gene fusion recombinant *L. tarentolae* vaccine against experimental murine visceral leishmaniasis. **PLoS Negl Trop Dis.** 2013
11. Hosseinzadeh S, **Bolhassani A**, Rafati S, Taheri T, Zahedifard F, Daemi A, Taslimi Y, Hashemi M, Memarnejadian A. A non-pathogenic live vector as an efficient delivery system in vaccine design for the prevention of HPV16 E7-overexpressing cancers. **Drug Deliv.** 2013
12. Hajizadeh MR, Mokarram P, Kamali Sarvestani E, **Bolhassani A**, Mostafavi Pour Z. Recombinant nonstructural 3 protein, rNS3, of Hepatitis C virus along with recombinant GP96 induce IL-12, TNF α and $\alpha 5$ integrin expression in antigen presenting cells. **Hepat Mon.** 2013
13. **Bolhassani A**, Javan zad S, Saleh T, Hashemi M, Aghasadeghi MR, Sadat SM. Polymeric nanoparticles: Potent vectors for vaccine delivery targeting cancer and infectious diseases. **Hum Vaccin Immunother.** 2013

14. Salehi M., Taheri T., Mohit E., Zahedifard F., Seyed N., **Bolhassani A.**, Rafati S. Recombinant *Leishmania tarentolae* encoding the HPV type 16 E7 gene in tumor mice model, **Immunotherapy** 2012
15. **Bolhassani A.**, Zahedifard F. Therapeutic live vaccines as a potential anti-cancer strategy, **Int. J. Cancer** 2012
16. Daemi A., **Bolhassani A.**, Rafati S., Zahedifard F., Hosseinzadeh S., Doustdari F. Different domains of glycoprotein 96 influence HPV16 E7 DNA vaccine potency via electroporation mediated delivery in tumor mice model. **Immunology Letters** 2012
17. **Bolhassani A.**, Rafati S. Mini-chaperone: Potential immuno-stimulators in vaccine design. **Human Vaccines & Immunotherapeutics** 2012
18. Daemi A., Hosseinzadeh S., Rafati S., Zahedifard F., Rajabi Bazl M., Doustdari F., Hashemi M., Agi E., **Bolhassani A.** HPV16 E7-CT (gp96) fusion protein: Molecular cloning, expression and purification of a recombinant 6xHis-tagged protein in *E. coli*. **Journal of Paramedical Sciences (JPS)**, 2012
19. Hosseinzadeh S., Daemi A., **Bolhassani A.** Heat shock proteins as the efficient vehicle in cancer. **Journal of Solid Tumors**, 2012
20. Mohit E., **Bolhassani A.**, Zahedifard F., Seyed N., Eslamifar A., Taghikhani M., Samimi-Rad K., Rafati S. Immunomodulatory effects of IP-10 chemokine along with PEI600-Tat delivery system in DNA vaccination against HPV infections. **Mol. Immunol.** 2012
21. Mohit E., **Bolhassani A.**, Zahedifard F., Taslimi Y., Rafati S. The contribution of NT-gp96 as an adjuvant for increasing HPV16 E7-specific immunity in C57BL/6 mouse model. **Scand. J. Immunol.** 2012

22. **Bolhassani A.** Potential efficacy of cell-penetrating peptides for nucleic acid and drug delivery in cancer. **BBA-Reviews on Cancer**, 2011
23. **Bolhassani A.**, Rafati S. Non-viral Delivery Systems in Gene Therapy and Vaccine Development. Full chapter for the book entitled as "Gene Therapy", InTech - Open Access Publisher, Published in 2011
24. Safaiyan S., **Bolhassani A.**, Nylen S., Akuffo H., Rafati S. Contribution of human neutrophils in the development of protective immune response during *in vitro Leishmania major* infection. **Parasite Immunology**, 2011
25. **Bolhassani A.**, Taheri T., Taslimi Y., Zamanilui S., Zahedifard F., Seyed N., Torkashvand F., Vaziri B. and Rafati S. Fluorescent *Leishmania* species: Development of stable GFP expression and its application for *in vitro* and *in vivo* studies. **Experimental Parasitology**, 2011
26. **Bolhassani A.**, Safaiyan S. and Rafati S. Improvement of different vaccine delivery systems for cancer therapy. **Molecular Cancer** 2011
27. **Bolhassani A.**, Gholami E., Zahedifard F., Moradin N., Parsi P., Doustdari F., Seyed N., Papadopoulou B. and Rafati S. *Leishmania major*: Protective capacity of DNA vaccine using amastin fused to HSV-1 VP22 and EGFP in BALB/c mice model. **Experimental Parasitology** 2011
28. **Bolhassani A.**, Mohit E. and Rafati S. Different spectra of therapeutic vaccine development against HPV infections. **Human Vaccines** 2009
29. **Bolhassani A.** and Rafati S. DNA immunization as an efficient strategy for vaccination. **Avicenna Journal of Medical Biotechnology** 2009
30. **Bolhassani A.**, Ghasemi N., Servis C., Taghikhani M. and Rafati S. The efficiency of a novel delivery system (PEI600-Tat) in development of potent DNA vaccine using HPV16 E7 as a model antigen. **Drug Delivery** 2009

31. **Bolhassani A.**, Zahedifard F., Taslimi Y., Taghikhani M., Nahavandian B. and Rafati S. Antibody detection against HPV16E7 and Gp96 fragments as biomarkers in cervical cancer patients. **Indian Journal of Medical Research** 2009
32. **Bolhassani A.**, Zahedifard F., Taghikhani M. and Rafati S. Enhanced immunogenicity of HPV16E7 accompanied by Gp96 as an adjuvant in two vaccination strategies. **Vaccine** 2008
33. **Bolhassani A.** and Rafati S. Heat shock proteins as powerful weapons in vaccine development. **Expert Review of Vaccine** 2008
34. Bathaie S.Z., **Bolhasani A.**, Hoshyar R., Ranjbar B., Sabouni F. and Moosavi-Movahedi A.A. Interaction of saffron carotenoids as anti-cancer compounds with ctDNA, oligo (dG.dC)₁₅ and oligo (dA.dT)₁₅. **DNA and Cell Biology** 2007
35. **Bolhasani A.**, Bathaie S.Z., Yavari I., Moosavi-Movahedi A.A. and Ghaffari M. Separation and purification of some components of Iranian saffron. **Asian Journal of Chemistry** 2005
36. **Bolhassani A.**, Taghikhani M., Ghasemi N., Soleimanjahi H. and Rafati S. Comparison of two delivery systems efficiency by using Polyethylenimine (PEI) for plasmid HPV16E7 DNA transfection into COS-7 cells. **Modarres Journal of Medical Sciences** 2008
37. **Bolhasani A.**, Bathaie S.Z., Ghaffari M. and Moosavi-Movahedi A.A. Interaction of monoterpene aldehydes of Iranian saffron with DNA. **Modarres Journal of Medical Sciences** 2003
38. Bathaie S.Z., Ashrafi M., **Bolhasani A.**, Etemadi-Kia B. and Moosavi-Movahedi A.A. Purification of carotenoids and monoterpene aldehydes from Iranian saffron and investigation of their effect on the structure of DNA, Histone H1 and H1-DNA complex. **Medical Plants of Iran** 2006
39. **Bolhassani A.**, Mohit E., Ghasemi N., Salehi M., Taghikhani M., Rafati S. Enhancement of potent immune responses to HPV16 E7 antigen by using different vaccine modalities. **BMC Proceedings** 2011
40. **Bolhassani A.**, Saleh T. Challenges in Advancing the Field of Cancer Gene Therapy: An overview of the multi-functional nanocarriers. InTech book - Open Access Publisher, Published in 2012

- 41. Bolhassani A.,** Khavari A., Orafa Z. Electroporation – Advantages and Drawbacks for Delivery of Drug, Gene and Vaccine. InTech book - Open Access Publisher, Published in 2014
- 42.** Three national patents with 15% share: Production of 1) Fluorescent *L. tarentolae*, 2) Fluorescent *L. major*, 3) Fluorescent *L. infantum*
- 43. Bolhassani A.** Comparison of DNA-based vaccine and non-pathogenic live vaccine strategies using the mini-chaperones for the prevention of HPV16 E7-overexpressing cancers. **Frontiers in Immunology**, 2013
- 44.** Kardani K, **Bolhassani A**, Shahbazi S. Prime-boost vaccine strategy against viral infections: Mechanisms and benefits. **Vaccine**. 2015
- 45.** Mehrlatifan S, Mirnurollahi SM, Motevalli F, Rahimi P, Soleymani S, **Bolhassani A**. The structural HCV genes delivered by MPG cell penetrating peptide are directed to enhance immune responses in mice model. **Drug Deliv**. 2015
- 46. Bolhassani A,** Kardani K, Vahabpour R, Habibzadeh N, Aghasadeghi MR, Sadat SM, Agi E. Prime/boost immunization with HIV-1 MPER-V3 fusion construct enhances humoral and cellular immune responses. **Immunol Lett**. 2015;168(2):366-73
- 47.** Shirbaghaee Z, **Bolhassani A**. Different applications of virus like particles in biology and medicine: Vaccination and delivery systems. **Biopolymers**. 2015
- 48. Bolhassani A,** Shirbaghaee Z, Agi E, Davoudi N. VLP production in *Leishmania tarentolae*: A novel expression system for purification and assembly of HPV16 L1. **Protein Expr Purif**. 2015
- 49.** Habibzadeh N, **Bolhassani A**, Vahabpour R, Sadat SM. How can Improve DNA Vaccine Modalities as a Therapeutic Approach against HIV Infections? **J AIDS Clin Res** 2015, 6:4
- 50.** Namvar A, **Bolhassani A**, Hashemi M. HPV16 L2 improves HPV16 L1 gene delivery as an important approach for vaccine design against cervical cancer. **Bratisl Med J** 2016; 117 (3)

51. Shirbaghaee Z, **Bolhassani A**, Mirshafiey A, Motevalli F, Zohrei N. A live Vector Expressing HPV16 L1 Generates an Adjuvant-Induced Antibody Response In-Vivo. **Iran J Cancer Preven.** 2015; 8(5): e3991
52. Mirnurollahi SM, Irani S, Davoudi N, **Bolhassani A**. Different protein expression systems can influence the direction of the immune responses against HCV core protein in animal model. **Vaccine Research** 2015
53. **Bolhassani A**. Which Vaccination Strategies and Immune Responses are More Effective Against HIV Infections. Intech Book 2016
54. Mirnurollahi SM, **Bolhassani A**, Irani S, Davoudi N. Expression and Purification of HCV Core and Core-E1E2 Proteins in Different Bacterial Strains. **Iran J Biotech.** 2015
55. Saleh T, **Bolhassani A**, Shojaosadati SA, Hosseinkhani S. Evaluation of Cell Penetrating Peptide Delivery System on HPV16E7 Expression in Three Types of Cell Line. **Iran J Biotech.** 2015
56. Kardani K, Mardani G, **Bolhassani A**. HPV prophylactic vaccines: Second-generation or first-generation vaccines. **Journal of Solid Tumors** 2015
57. Khavari A, Orafa Z, Hashemi M, Habibzadeh N, **Bolhassani A**. Different physical delivery systems: An important approach for delivery of biological molecules in vivo. **Journal of Paramedical Sciences** 2016
58. Mirnurollahi SM, Irani S, **Bolhassani A**. Different expression systems for production of HCV structural proteins. **Journal of Paramedical Sciences** 2015
59. Alizadeh F, **Bolhassani A**. *In vitro* cytotoxicity of Iranian saffron and two main components as a potential anti-cancer drug. **SM Journal of Pharmacology and Therapeutics** 2015
60. Javan zad S, **Bolhassani A**, Doustdari F, Hashemi M, Movafagh A. Reverse staining method of polyacrylamide gels by imidazole-zinc salts for detection and purification of L1 capsid protein in E.coli. **Journal of Paramedical Sciences** 2013

61. Kohan L, Nasiri M, Habib A, **Bolhasani A**. Association of G-2548A polymorphism in the promoter of Leptin gene with plasma leptin level and risk of type 2 diabetes. **J Shahid Sadoughi Univ Med Sci** 2013 (**Persian**)
62. Daemi A, Hosseinzadeh S, **Bolhassani A**, Agi E. DNA-based vaccine is more efficient than non-pathogenic live vaccine for prevention of HPV16E7-overexpressing cancers. **Vaccine Research** 2014
63. Shafiee Ardestani M, Salehi Fordoei A, Abdoli A, Ahangari Cohan R, Bahramali G, Sadat SM, Siadat SD, Moloudian H, Nassiri N, **Bolhasani A**, Rahimi P, Hekmat S, Davari M, Aghasadeghi MR. Nanosilver based anionic linear globular dendrimer with a special significant antiretroviral activity. **J Mater Sci: Mater Med**, 2015

- 64.** Mardani G, **Bolhassani A**, Agi E, Shahbazi S, Mehdi Sadat S. Protein vaccination with HPV16 E7/Pep-1 nanoparticles elicits a protective T-helper cell-mediated immune response. *IUBMB Life*. 2016 Jun;68(6):459-67.
- 65.** Larijani MS, Sadat SM, Nikbin M, Talebi SS, Javadi F, Mohajel N, **Bolhassani A**, Daneshvar M, Aghasadeghi MR, Pouriayevali MH, Mapar M. Correlation Study Between IL-28B Gene Polymorphism (rs8099917SNP) and Sustained Virological Response in Iranian Patients with Chronic Hepatitis C. *Clin Lab*. 2016;62(3):417-23.
- 66.** Kadkhodayan S, Sadat SM, Irani S, Fotouhi F, **Bolhassani A**. Generation of GFP Native Protein for Detection of Its Intracellular Uptake by Cell-Penetrating Peptides. *Folia Biol (Praha)*. 2016;62(3):103-9.
- 67.** Milani A, Basirnejad M, Shahbazi S, **Bolhassani A**. Carotenoids: Biochemistry, pharmacology and treatment. *Br J Pharmacol*. 2016 Sep 16. doi: 10.1111/bph.13625
- 68.** Behnaz Sadat Jafarzade, **Azam Bolhassani**, Seyed Mehdi Sadat, Ramin Yaghobi. Delivery of HIV-1 Nef Protein in Mammalian Cells Using Cell Penetrating Peptides as a Candidate Therapeutic Vaccine, *International Journal of Peptide Research and Therapeutics* 2016, 1-9
- 69.** Kadkhodayan S, **Bolhassani A**, Sadat SM, Irani S, Fotouhi F. The efficiency of Tat cell penetrating peptide for intracellular uptake of HIV-1 Nef expressed in *E. coli* and mammalian cell. *Curr Drug Deliv* 2016; in press

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