

Azam Rahimpour, Ph.D

Assistant Professor, Medical Biotechnology

School of Advanced Technologies in Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran

rahimpour@sbmu.ac.ir

Education

Ph.D. Medical Biotechnology (2007 - 2014)

Biotechnology Research Center, Pasteur Institute of Iran, Tehran, Iran

M.Sc. Medical Biotechnology (2003 - 2006)

Department of Medical Biotechnology, Tarbiat Modares University, Tehran, Iran

B.Sc. Cell and Molecular Biology (1999 - 2003)

Faculty of Basic Science, Shiraz University, Shiraz, Iran

Publications

➤ *Books*

- Davami F, **Rahimpour A**, Nematollahi L and Jahandar H, “Monoclonal antibodies; a novel challenge in Biotechnology”, Nardis publications, 2012.
- Soleimani M and **Rahimpour A**, “Introduction to gene expression engineering in mammalian cells”, Rahdan publications, 2010.
- Rasae MJ and **Rahimpour A**, “Bioethics” Ro-dar-Ro publications, 2006.

➤ *Papers*

- Shams F, Pourjabbar B, Hashemi N, Farahmandian N, Golchin A, Nuoroozi G, **Rahimpour A**. Current progress in engineered and nano-engineered mesenchymal stem cells for cancer: From mechanisms to therapy. Biomed Pharmacother. 2023 Nov;167:115505.
- Mohammadkhani N, **Rahimpour A**, Hoseinpoor R, Rajabibazl M. Development of Stable CHO-K1 Cell Lines Overexpressing Full-Length Human CD20 Antigen. Iran Biomed J. 2023 Jun 21.
- **Rahimpour A**, Mosallaei M, Pourghazi F, Tabatabaee SH, Hoseinpoor R, Pourmaleki E, Soosanabadi M. Development of an Expression Vector Engineering Strategy Based on tDNA Insulator Element for the Stable Expression of Vascular Endothelial Growth Factor Receptor-Fc Fusion Protein. Monoclon Antib Immunodiagn Immunother. 2023 Aug;42(4):140-144.
- Azari A, Rahimi A, Rajabibazl M, Abbaszadeh HA, Hosseinzadeh S, **Rahimpour A**. Evaluation of in vitro coculture of keratinocytes derived from foreskin and adipose-derived mesenchymal stem cells (AMSCs) on a multilayer oxygen-releasing electrospun scaffold based on PU/PCL.Sodium percarbonate (SPC)-gelatine/PU. Cell Biochem Funct. 2023 Jun;41(4):434-449.
- Ghorbani R, Hosseinzadeh S, Azari A, Taghipour N, Soleimani M, **Rahimpour A**, Abbaszadeh HA.

The Current Status and Future Direction of Extracellular Nano-vesicles In the Alleviation of Skin Disorders. *Curr Stem Cell Res Ther.* 2023 Apr 18.

- Hashemi N, Tabatabaee SH, Shams F, **Rahimpour A**, Kazemi B, Rajabibazl M, Ranjbari J. Overexpression of SIRT6 alleviates apoptosis and enhances cell viability and monoclonal antibody expression in CHO-K1 cells. *Mol Biol Rep.* 2023 Jul;50(7):6019-6027.
- Shams F, Bayat H, Mohammadian O, Mahboudi S, Vahidnezhad H, Soosanabadi M, **Rahimpour A**. Advance trends in targeting homology-directed repair for accurate gene editing: An inclusive review of small molecules and modified CRISPR-Cas9 systems. *Bioimpacts.* 2022;12(4):371-391.
- Maleki R, **Rahimpour A**, Rajabibazl M. Construction and evaluation of wild and mutant ofatumumab scFvs against the human CD20 antigen. *Prep Biochem Biotechnol.* 2022 May 17:1-8.
- Mohammadi P, Yarani R, **Rahimpour A**, Ranjbarnejad F, Mendes Lopes de Melo J, Mansouri K. Targeting endothelial cell metabolism in cancerous microenvironment: a new approach for anti-angiogenic therapy. *Drug Metab Rev.* 2022 Nov;54(4):386-400.
- Zarif-Yeganeh M, Farhud DD, **Rahimpour A**, Sheikholeslami S, Shivaie S, Hedayati M. CRISPR/Cas9 RET Gene Knockout in Medullary Thyroid Carcinoma Cell-lines: Optimization and Validation. *Iran J Public Health.* 2022 May;51(5):1084-1096.
- Shams F, Moravvej H, Hosseinzadeh S, Mostafavi E, Bayat H, Kazemi B, Bandehpour M, Rostami E, **Rahimpour A**, Moosavian H. Overexpression of VEGF in dermal fibroblast cells accelerates the angiogenesis and wound healing function: in vitro and in vivo studies. *Sci Rep.* 2022 Nov 2;12(1):18529.
- **Rahimpour A**, Pourmaleki E, Shams F, Payandeh Z, Pourzardosht N, Didehdar M, Gholami M. The effect of Ccnb1ip1 insulator on monoclonal antibody expression in Chinese hamster ovary cells. *Mol Biol Rep.* 2022 Jan 25.
- Shams F, Moravvej M, Hosseinzadeh S, Kazemi B, Rajabibazl M, **Rahimpour A**. Evaluation of in vitro fibroblast migration by electrospun triple-layered PU-CA/gelatin. PRGF/PU-CA scaffold using an AAVS1 targeted EGFP reporter cell line. *BioImpacts.* In press. Published online: 2021 Aug 30.
- Javan MR, **Rahimpour A**, Moazzeni SM. Simultaneous transduction of dendritic cells with A20 and BTLA genes stimulates the development of stable and efficient tolerogenic dendritic cells and induces regulatory T cells. *Int Immunopharmacol.* 2021 Jul 24;99:107966.
- Shams F, **Rahimpour A**, Vahidnezhad H, Hosseinzadeh S, Moravvej H, Kazemi B, Rajabibazl M, Abdollahimajd F, Uitto J. The Utility of Dermal Fibroblasts in Treatment of Skin Disorders: A Paradigm of Recessive Dystrophic Epidermolysis Bullosa. *Dermatol Ther.* 2021 Jun 17;e15028.
- Mahboudi S, Moosavi-Nasab M, Kazemi B, **Rahimpour A**, Hadi Eskandari M, Mohammadian O, Shams F. Utilization of the human gamma-satellite insulator for the enhancement of anti-PCSK9 monoclonal antibody expression in Chinese hamster ovary cells. *Mol Biol Rep.* 2021 May;48(5):4405-4412.
- Tayebi T, Baradaran-Rafii A, Hajifathali A, **Rahimpour A**, Zali H, Shaabani A, Niknejad H. Biofabrication of chitosan/chitosan nanoparticles/polycaprolactone transparent membrane for corneal

endothelial tissue engineering. *Sci Rep* 2021 Mar 29;11(1):7060.

- Naghneh E, Pourmaleki E, **Rahimpour A**. Evaluation of the Effects of Human Beta-Interferon Scaffold Attachment Region (IFN-SAR) on Expression of Vascular Endothelial Growth Factor-Fc (VEGF-Fc) Fusion Protein. *Pharm Sci*. 2020 26 (4), 393-398.
- Hoseinpoor R, Kazemi B, Rajabibazl M, **Rahimpour A**. Improving the expression of anti-IL-2R α monoclonal antibody in the CHO cells through optimization of the expression vector and translation efficiency. *J Biotechnol*. 2020 Dec 20;324:112-120.
- Kadkhodazadeh M, Rajabibazl M, Motedayen MH, Shahidi S, Vaise Malekshahi Z, **Rahimpour A**, Yarahmadi M. Isolation of polyclonal scFv fragments against venomous snakes of Iran and evaluation of its capability in neutralizing the venom. *Iran J Pharm Res*. Summer 2020;19(3):288-296.
- Pairawan SM, Bolhassani A, **Rahimpour A**. Enhanced transient expression of an anti-CD52 monoclonal antibody in CHO cells through utilization of miRNA sponge technology. *Res Pharma Sci*. 2019, 14 (4), 335-342.
- Mohammadian O, Rajabibazl M, Pourmaleki E, Bayat H, Ahani R, **Rahimpour A**. Development of an improved lentiviral based vector system for the stable expression of monoclonal antibody in CHO cells. *Prep Biochem Biotechnol*. 2019, 49(8):822-829.
- Payandeh Z, Rajabibazl M, Mortazavi Y, **Rahimpour A**. In Silico Analysis for Determination and Validation of Human CD20 Antigen 3D Structure. *Int J Pept Res Ther*. 2019, 25(1): 123–135.
- Payandeh Z, Bahrami AA, Hoseinpoor R, Mortazavi Y, Rajabibazl M, **Rahimpour A**, Taromchi AH, Khalil S. The applications of anti-CD20 antibodies to treat various B cells disorders. *Biomed Pharmacother*. 2019, Jan;109:2415-2426.
- Payandeh Z, Rajabibazl M, Mortazavi Y, **Rahimpour A**, Taromchi AH, Dastmalchi S. Affinity maturation and characterization of the ofatumumab monoclonal antibody. *J Cell Biochem*. 2019, Jan;120(1):940-950.
- Naderi F, Hashemi M, Bayat H, Mohammadian O, Pourmaleki E, Etemadzadeh MH, **Rahimpour A**. The Augmenting Effects of the tDNA Insulator on Stable Expression of Monoclonal Antibody in Chinese Hamster Ovary Cells. *Monoclon Antib Immunodiagn Immunother*. 2018, Nov;37(5):200-206.
- Payandeh Z, Rajabibazl M, Mortazavi Y, **Rahimpour A**, Taromchi AH. Ofatumumab Monoclonal Antibody Affinity Maturation Through in silico Modeling. *Iran Biomed J*. 2018, May 1;22(3):180-92.
- Bayat H, Hossienzadeh S, Pourmaleki E, Ahani R, **Rahimpour A**. Evaluation of different vector design strategies for the expression of recombinant monoclonal antibody in CHO cells. *Prep Biochem Biotechnol*. 2018, Feb 7;48(2):160-164.
- Bayat H, Naderi F, Khan AH, Memarnejadian A, **Rahimpour A**. The impact of CRISPR-Cas system on antiviral therapy. *Adv Pharm Bull*. 2018, Nov;8(4):591-597.
- Foroumadi S, Rajabibazl M, **Rahimpour A**, Shahidi S, Ebrahimizadeh W, Yarahmadi M, Rajabi S,

Daraei A, Production of human single-chain fragment antibody (ScFv) against human epidermal growth factor receptor-2 (HER-2) by phage display technology. *In Vitro Cell Dev Biol Anim.* 2018, Feb;54(2):85-91.

- Bayat H, Modarressi MH, **Rahimpour A.** The Conspicuity of CRISPR-Cpf1 System as a Significant Breakthrough in Genome Editing. *Curr Microbiol.* 2018, Jan;75(1):107-115.
- Moi IM, Roslan NN, Leow ATC, Ali MSM, Rahman RNZRA, **Rahimpour A,** Sabri S, The biology and the importance of Photobacterium species. *Appl Microbiol Biotechnol.* 2017, Jun;101(11):4371 - 4385.
- Khan AH, Bayat H, Rajabibazl M, Sabri S, **Rahimpour A.** Humanizing glycosylation pathways in eukaryotic expression systems. *World J Microbiol Biotechnol.* 2017, Jan;33(1):4.
- Bayat H, Omidi M, Rajabibazl M, Sabri S, **Rahimpour A.** The CRISPR Growth Spurt: from Bench to Clinic on Versatile Small RNAs. *J Microbiol Biotechnol.* 2017, Feb 28;27(2):207-218.
- Bayat H, Omidi M, Peyrovan M, Mohammadian O, Naderi N, **Rahimpour A.** Stable Expression of anti-CD52 Monoclonal Antibody Using a Bicistronic Vector System. *Biology and Medicine,* 2016, 8 (7), 1.
- **Rahimpour A,** Ahani R, Najaei A, Adeli A Barkhordari F, Mahboudi F. Development of the Genetically Modified Chinese Hamster Ovary Host Cells for the Enhancement of Recombinant Tissue Plasminogen Activator Expression. *MJMS,* 2016, 23(2): 6-13.
- **Rahimpour A,** Najaei A, Mahboudi F. Efficiency of translation and post-translation regulatory genes in optimization of tissue plasminogen activator gene expression. *Koomesh,* 2015, 17(1): 196-202.
- **Rahimpour A,** Vaziri B, Moaazami R, NematollahiL, Mahboudi F. Engineering the cellular protein secretory pathway for enhancement of recombinant human tPA expression in CHO cells. *J Microbiol Biotechnol,* 2013, 23(8), 1116-1122.
- **Rahimpour A,** Vaziri B, Nematollahi L, Barkhordari F, Adeli A, Mahboudi F. Enhancement of recombinant human tissue plasminogen activator expression in CHO cells using matrix attachment region containing vectors and promoter activation strategy. *Modares Journal of Medical Sciences,* 2013, 16(1), 11-23.
- Rajabibazl M, Rasaei MJ, Forouzandeh M, **Rahimpour A.** Retroviral transduction of fluonanobody and the variable domain of camelid heavy-chain antibodies to chicken embryonic cells. *Iran J Immunol.* 2013, 10(4):247-58.
- Nematollahi L, Khalaj V, Babazadeh M, **Rahimpour A,** Jahandar H, Davami F, Mahboudi F. Periplasmic Expression of a Novel Human Bone Morphogenetic Protein-7 Mutant in Escherichia coli. *Avicenna J Med Biotech,* 2012, 4(4): 178-185.
- Nematollahi L, Khalaj V, **Rahimpour A,** Jahandar H, Mahboudi F. A novel human Bone Morphogenetic Protein-7 variant with enriched heparin-binding site. *Molecular Biology,* 2013, 47(3), 399-405.
- Rajabi M, Rasaei MJ, Forouzandeh M, **Rahimpour A,** Kiani J, Rahbarizadeh F, Alirezapour B,

Mohammadi M. Production of chimeric recombinant single domain antibody-green fluorescent fusion protein in Chinese hamster ovary cells, *Hybridoma*, 2007, 26 (1): 1-9.

- Hosseini Kakhak SA, Ghanbari Niaki A, Rahbarizadeh F, **Rahimpour A**. Exercise training enhances autotirelatedprotein expression in male trained rat skeletal muscle. *Research in Sport Science*, 2006, 16: 69-79.

➤ *Abstracts and Presentations*

- Mohammad Khani N, **Rahimpour A**, Rajabibazl M. Lentivirus-derived vectors, applied tools for gene transmission in Chinese hamster ovary cells (CHO). 11th Biotechnology congress, Tehran (2019).
- **Rahimpour A**, Mohammadian O, Rajabibazl M, Bayat H, Ahani R. Expression of Monoclonal Antibody in Chinese Hamster Ovary Cells Using Lentivirus Vectors, presented in the 10th Biotechnology congress, Tehran (2017).
- **Rahimpour A**, Barkhordari F, Adelij A, Mahboudi F. Optimization of the expression vector for enhancement of human tissue plasminogen activator expression level, presented in the 9th Biotechnology congress, Tehran (2015).
- **Rahimpour A**, Vaziri B, Barkhordari F, Mahboudi F. Enhancement of transient gene expression in CHO cells by overexpression of ceramide transfer protein, presented in the 7th Biotechnology congress, Tehran (2012).
- Rajabi M, Rasae MJ, Foruzandeh M, Mohammadi M, **Rahimpour A**, Naderi M. Development of transgenic chicken containing flubody. Presented in the 10th Iranian congress of biochemistry and 3th international congress of biochemistry and molecular biology, Tehran (2010).
- Rajabi M, Rasae MJ, Foruzandeh M, Bamdad T, Mohammadi M, **Rahimpour A**, Karvandian K. Construction of recombinant retrovirus containing GFP-nanobody fusion protein with lysosyme secretion signal. Presented in the 5th national biotechnology congress, Tehran (2007).
- **Rahimpour A**, Rasae MJ, Rahbarizadeh F, Foruzandeh M, Rajabi M. Cloning and expression of single domain camel antibody in SP2/0 myeloma cells. Presented in the 9th congress of genetics, Tehran (2006).
- **Rahimpour A**, Rasae MJ, Rahbarizadeh F, Rajabi M. Secretary expression of single domain camel antibody in SP2/0 myeloma cells. Presented in the 7th Research congress of medical students Tehran (2006).
- **Rahimpour A**, Rasae MJ, Rahbarizadeh F, Rajabi M, Khoddami Vishte V. Optimyztion of tansfection efficiency of myeloma cells using pcDNA-GFP repoter vector. Presented in the 14th biology congress, Tehran (2006).
- RajabiM, Rasae MJ, Foruzandeh M, **Rahimpour A**, Kiani J .Production of single domain antibody green fluorescent protein fusion protein in Chinese Hamster Ovary cells. Presented in the 14th biology congress, Tehran, Trabiat Modares University (2006).
- Khoddami Vishte V, Foruzadeh M, Rahbarizadeh F, Rasae MJ, **Rahimpour A**. Marking a population of MCF-7 breast cancer cell line with EGFP using pEGFP hygro; a newly synthesized

shuttle vector. Presented in the 9th congress of genetics, Tehran (2006).

- Khoddami Vishte V, Foruzandeh M, Rahbarizadeh F, Rasaei MJ, **Rahimpour A**. Construction of a new hygromycin resistance enhanced green fluorescent (EGFP) fusion vector (pEGFP-Hygro). Presented in the 4th congress of biotechnology in Kerman (2005).

Highlighted Projects

➤ *As Principal Investigator:*

- Evaluation of the effect of exosomes derived from adipose tissue mesenchymal stem cells preconditioned with resveratrol in combination with polyurethane-chitosan/gelatin-cellulose acetate scaffold on full-thickness wound healing in the rat model. School of Advanced Technologies in Medicine, Shahid Beheshti University of Medical Sciences, 2022-present.
- Expression of anti-CD52 monoclonal antibody using a tricitronic vector containing mutant neomycin phosphotransferase gene and IFN-beta scaffold matrix attachment region. Cell and Molecular Biology Research Center, Shahid Beheshti University of Medical Sciences, 2021-present.
- Evaluation of the efficiency of lentiviral vector containing tDNA insulator sequence in GFP reporter gene expression in human fibroblast cell line. Medical Nanotechnology and Tissue Engineering Research Center, Shahid Beheshti University of Medical Sciences, 2020-2022.
- Development of optimized CHO host cells by manipulation of SIRT6 gene for recombinant antibody production. School of Advanced Technologies in Medicine, Shahid Beheshti University of Medical Sciences, 2019-2023.
- Targeted integration of the VEGF 165 gene into the AAVS1 locus in human fibroblast cells. Shahid Beheshti University of Medical Sciences, 2018-2022.
- Evaluation of the effects of gamma satellite insulator sequence on expression of the anti-PCSK9 monoclonal antibody in Chinese hamster ovary cells. Shahid Beheshti University of Medical Sciences, 2018-2021.
- Targeted integration of the GFP reporter gene to the genome of HDF dermal fibroblast cells using the CRISPR-Cas9 system. School of Advanced Technologies in Medicine, Shahid Beheshti University of Medical Sciences, 2017-2021.
- Optimization of the expression vector for efficient expression of the VEGF binding fusion protein in CHO cells, Shahid Beheshti University of Medical Sciences, 2016-2019.
- Evaluation of the efficiency of the enhanced specificity CRISPR-Cas9 system on simultaneous knock-out of Bak and Bax proapoptotic genes in CHO cells. Medical Nanotechnology and Tissue Engineering Research Center, Shahid Beheshti University of Medical Sciences, 2016-2018.
- Evaluation of different expression vector systems on transient and stable expression of monoclonal antibody in CHO cells. Medical Nanotechnology and Tissue Engineering Research Center, Shahid Beheshti University of Medical Sciences, 2016-2018.
- Laboratory production and characterization of the Alemtuzumab monoclonal antibody. Shahid Beheshti University of Medical Sciences, 2015-2018.

- Application of the RNA-guided FokI Nuclease (RFN) system for targeted genome editing in CHO cells. Medical Nanotechnology and Tissue Engineering Research Center, Shahid Beheshti University of Medical Sciences, 2015-2017.
 - Evaluation of the effects of the insulator region containing tDNA gene on stable expression of the anti-CD52 monoclonal antibody in CHO cells. School of Advanced Technologies in Medicine, Shahid Beheshti University of Medical Sciences, 2015-2017.
 - Evaluation of human interferon beta matrix attachment region for stable expression of Alemtuzumab monoclonal antibody in CHO cells, Medical Nanotechnology and Tissue Engineering Research Center, Shahid Beheshti University of Medical Sciences, 2015-2017.
- ***As Research Associate:***
- Designing and construct of single chain variable fragment (scFv) from the biosimilar and improve affinity Variant of Ofatumumab, a fully Human monoclonal Antibody. School of Medicine, Shahid Beheshti University of Medical Sciences, 2019-2021.
 - Overexpression of the HSP27 chaperon in Sp2/0 cells for the enhancement of viable cell density in batch culture, Cellular and Molecular Research Center, Shahid Beheshti University of Medical Sciences, 2018-2021.
 - Effect of Hsp70 on Expression of Transferrin in *Saccharomyces cerevisiae*, Cellular and Molecular Research Center, Shahid Beheshti University of Medical Sciences, 2019-present.
 - Anticancer effect of human amniotic mesenchymal cells encapsulated with gelatin-based nanocomposite in mouse model of breast cancer, School of Medicine, Shahid Beheshti University of Medical Sciences, 2016-2019.
 - Investigation of targeted EGFR inhibition and increasing of the therapeutic efficacy of 5-FU by conjugated cetuximab graphene-based nanoparticle in murine allografted (EGFR) colon carcinoma, School of advanced technologies in medicine, Shahid Beheshti University of Medical Sciences, 2016-2019.
 - Vector Engineering using UCOE sequences for Improving the Expression of Basiliximab Monoclonal Antibody in CHO Cells. Cellular and Molecular Research Center, Shahid Beheshti University of Medical Sciences, 2016-2020.
 - New monoclonal antibody in silico design against CD20, School of Medicine, Shahid Beheshti University of Medical Sciences, 2016-2018.
 - Design and construction of electromechanical chip for rapid measurement of IgG1 antibody in cell culture supernatant, Medical Nano-Technology & Tissue Engineering Research Center, Shahid Beheshti University of Medical Sciences, 2015-2016.
 - Isolation of Monoclonal phages particles containing scFv against prostate specific membrane antigen, under supervision of Dr. Masoumeh Rajabibazl, School of Advanced Technologies in Medicine, Shahid Beheshti University of Medical Sciences, 2015-2017.
 - Evaluation of transcriptional and post-transcriptional regulatory elements for the enhancement of recombinant tissue plasminogen activator expression from interferon beta matrix attachment region

containing vector, Pasteur Institute of Iran, 2014-2017.

Teaching Experience

- Bioinformatics
- Gene Therapy
- Advanced cell and molecular techniques
- Principles of standardization and safety of biotechnology products
- Principles of standardization and safety of biologic products
- Cell culture