Reza Khayami

Mashhad University of Medical Sciences, Mashhad, Iran

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EDUCATION

Mashhad University of Medical Sciences   Mashhad, Iran

MSc, Human Genetics   Sep 2018- Jan 2022

- Thesis: Investigating the Role of *SLC30A10* and *SLC30A3* Overexpression in Colorectal Cancer Cells
- Awards: Ranked 1st in the class; Faculty of medicine top student researcher award
- GPA: 18.67/20

Mashhad University of Medical Sciences   Mashhad, Iran

BSc, Laboratory Sciences   Sep 2014- Jul 2018

- GPA: 16.99/20

RESEARCH EXPERIENCE

Mashhad University of Medical Sciences   Avan Lab

Department of Medical Genetics and Molecular Medicine   Feb 2024-present

- Integration of multi-omics data to find novel insights about mechanisms underlying gastrointestinal cancers.

Mashhad University of Medical Sciences   Kerachian Lab

Cancer Research Center   Oct 2022- Dec 2023

- Developed machine learning models on DNA methylation data to improve early cancer diagnosis accuracy.
- Perfromed RNA-seq analysis to find prognostic markers for acute myeloid leukemia.
- Facilitated academic support to students on their theses, ensuring successful project completion.
- Performed statistical analyses for research projects, yielding essential insights.
- Wrote proposals and manuscript drafts.

Mashhad University of Medical Sciences   Kerachian Lab

Department of Medical Genetics and Molecular Medicine   Sep 2018- Aug 2022

- Developed a variant detection workflow for whole exome sequencing.
- Implemented machine learning algorithms on colorectal cancer data and developed an app for patient data analysis.
- Employed wet lab techniques (e.g. cell culture, cloning, PCR) for thesis research.
- Wrote the draft of various manuscripts.
- Mentored graduate and undergraduate researchers in the lab.
- Conducted statistical analyses for various research projects, providing key insights.
- Managed animal lab work with nude mice for a research project.

Mashhad University of Medical Sciences   Hassanian Lab

Department of Medical Biochemistry   Feb 2017- Jan 2018

- Helped synthesize text and illustrate images for review articles on the role of adenosine in various cancers to enhance understanding of adenosine's role in cancer.

Mashhad University of Medical Sciences   Pasdar Lab

Department of Medical Genetics and Molecular Medicine   Mar 2016- Dec 2017

- Assisted PhD students in advancing research projects.

PUBLICATIONS

Journal Publications

- Vakilzadeh MM, **Khayami R**, Daneshdoust D, Moshfeghinia R, Sharifnezhad F, Taghiabadi Z, Keikhay Moghadam H et al. Prevalence of tobacco use among cancer patients in Iran: a systematic review and meta-analysis. *BMC Public Health*. 2024;24(1):1-16.
  Role: performed statistical analysis, wrote the method and results sections

- Hashemi SR, Matin MM, Avan A, Farrokhi S, Rigi F, **Khayami R**, Azghandi M, Esmaeilnia M, Kerachian MA. The significant role of a functional polymorphism rs9637231 in long non-coding RNA, LINC02892 in colorectal cancer: Evidence from an Iranian cohort. *Human Gene*. 2023;38:201226.
  Role: performed statistical and bioinformatics analyses, wrote the manuscript

- Abavisani M#, **Khayami R**#, Hoseinzadeh M, Kodori M, Kesharwani P, Sahebkar A. CRISPR-Cas system as a promising player against bacterial infection and antibiotic resistance. *Drug Resistance Updates*. 2023:100948.
  Role: wrote the manuscript, created images

- Toroghian Y#, **Khayami R**#, Hassanian SM, Nassiri M, Ferns GA, Khazaei M, Avan A. The Therapeutic Potential of Targeting the Toll-like Receptor Pathway in Breast Cancer. *Current Pharmaceutical Design*. 2022;28(27):2203-10.
  Role: wrote the manuscript

- **Khayami R**, Goltzman D, Rabbani SA, Kerachian MA. Epigenomic effects of vitamin D in colorectal cancer. *Epigenomics*. 2022;14(19):1213-28.
  Role: wrote the manuscript, created images

- Abavisani M, Rahimian K, Kodori M, **Khayami R**, Sisakht MM, Mahmanzar M, Meshkat Z. In silico analysis of the substitution mutations and evolutionary trends of the SARS-CoV-2 structural proteins in Asia. *Iranian Journal of Basic Medical Sciences*. 2022;25(11):1299.
  Role: wrote the manuscript, visualized the data in R and graphPad

- Mirinezhad MR, Khosroabadi N, Rahpeyma M, **Khayami R**, Hashemi SR, Ghazizadeh H, Ferns GA, Pasdar A, Ghayour-Mobarhan M, Hamzehloei T. Genetic determinants of premature menopause in a Mashhad population cohort. *International Journal of Fertility & Sterility*. 2021;15(1):26.
  Role: wrote the manuscript

- Ghorbani M, Azghandi M, **Khayami R**, Baharara J, Kerachian MA. Association of MTHFR C677T variant genotype with serum folate and Vit B12 in Iranian patients with colorectal cancer or adenomatous polyps. *BMC Medical Genomics*. 2021;14:1-8.
  Role: performed statistical analysis, edited the manuscript

- **Khayami R**#, Hashemi SR#, Kerachian MA. Role of aldo-keto reductase family 1 member B1 (AKR1B1) in the cancer process and its therapeutic potential. *Journal of cellular and molecular medicine*. 2020;24(16):8890-902.
  Role: wrote the manuscript, created images

- Afzaljavan F, Tehrani NC, Rivandi M, Ghasemian SZ, Vahednia E, **Khayami R**, Abavisani M, Pasdar A. The dilemma of TP53 codon 72 polymorphism (rs1042522) and breast cancer risk: a case-control study and meta-analysis in the Iranian population. *Cell Journal (Yakhteh)*. 2020;22(2):185.
  Role: sample acquisition, PBMC extraction

- **Khayami R**, Toroghian Y, Bahreyni A, Bahrami A, Khazaei M, Ferns GA, Ebrahimi S, Soleimani A, Fiuji H, Avan A. Role of adenosine signaling in the pathogenesis of head and neck cancer. *Journal of cellular biochemistry*. 2018;119(10):7905-12.
  Role: wrote the manuscript

- Bahreyni A, Samani SS, Ghorbani E, Rahmani F, **Khayami R**, Toroghian Y, Behnam-Rassouli R, Khazaei M, Ryzhikov M, Parizadeh MR. Adenosine: an endogenous mediator in the pathogenesis of gynecological cancer. *Journal of Cellular Physiology*. 2018;233(4):2715-22.
  Role: data acquisition, assisted in writing the manuscript

Conference Presentations

- Hashemi, S. R., **Khayami, R.**, Mousavi Bazzaz, F., Azghandi, M., & Kerachian, M. A. (2020). Association of rs9637231 polymorphism as a risk factor with colorectal cancer. *The Fourth International and 16th National Genetics Congress, Tehran*. https://civilica.com/doc/1195526
  Role: prepared the poster and presented it in English

Book Chapters

- Taghizadieh, M., Modiri, N., Salmaninejad, A., **Khayami, R.**, Taheri, F., Moghoofei, M., Khatami, A., Azhdari, S., Bayat, M., Samadi-khouzani, A., & Sadri Nahand, J. (2023). Chapter 6 - neuroprotective effects of flavonoids. In H. Khan, M. Aschner, & H. Mirzaei (Eds.), Phytonutrients and neurological disorders (pp. 133--200). Academic Press. https://doi.org/10.1016/B978-0-12-824467-8.00016-4

WORK IN PROGRESS/SUBMISSION PROCESS ───────────

- **Finding Diagnostic and Prognostic Markers in Gastrointestinal Cancers by using Pan-cancer Analysis of Omics Data**
  Role: conducted bioinformatic analysis (bulk and single cell)

- **The establishment of a prognostic scoring model based on the tumor microenvironment in acute myeloid leukemia**
  Role: conducted bioinformatic analysis (bulk RNAseq), developing models (lasso, cox)

- **Detecting Gastrointestinal Cancer Tissue Types Using Methylation Data and Machine Learning**
  Role: conducted bioinformatic analysis (methylation), developing models (SVM, MLR xGBoost)

- **Selective DNA demethylation at *SLC30A10* promoter in colorectal cancer therapy**
  Role: RNA extraction, cDNA synthesis, running Real-time PCR, cell culture (wound healing assay, colony formation assay, MTT assay, Transwell assay), molecular cloning (creating competent cells, digestion, ligation, transformation), mice handling, flow cytometry data analysis, writing the manuscript

- **Novel LncRNA LINC02892 Promotes Colorectal Cancer Development Through Regulating Wnt Signaling Pathway**
  Role: conducted bioinformatic analysis, writing the manuscript, mice handling

- **Towards enhanced Mycobacterium tuberculosis detection: Evaluating CRISPR technology's diagnostic accuracy through a meta-analysis and systematic review**
  Role: performed statistical analysis, writing the manuscript

- **CRISPR Technology for Methicillin-resistant Staphylococcus Aureus Detection: a Systematic Review and Meta-analysis of Diagnostic Accuracy**
  Role: performed statistical analysis, writing the manuscript

PROJECTS WITHOUT PUBLICATIONS ───────────

- **Developing a Variant Calling Pipeline for Better Detection of Germline Variants**
  Role: developing the pipeline from fastq to vcf in linux

- **Developing a machine learning platform to detect colorectal cancer based from blood with real-time PCR data (Patent)**

Role: developed machine learning models (SVM, MLR), creating an app using Shinyapps

- **creating a multiplex PCR assay to detect Helicobacter pylori**
  Role: designed the primers, ran PCR tests
- **creating a multiplex PCR assay to detect CMV, HSV1 and HSV2**
  Role: designed the primers, ran PCR tests

SKILLS

Programming: R, Python (familiar), Linux (bash)

Bioinformatics: RNA-seq analysis (Bulk and Single-cell), NGS data analysis, whole genome bisulfite sequencing, microarray data analysis, methylation array data analysis, multi-omics data integration, bioinformatics databases, Cytoscape, FlowJo

Machine learning: supervised and unsupervised learning algorithms

- **Illustrations:** Adobe Photoshop, Adobe Illustrator, BioRender, ImageJ, PyMOL

Wet lab: PCR, qPCR, gel electrophoresis, nucleic acid extraction, molecular cloning, general cell culture, wound healing assay, MTT assay, cell proliferation assay, Western blot (familiar)

LANGUAGES

Farsi/Persian: Native

English: Toefl Score: 112 (Reading: 27, Listening: 29, Speaking: 28, Writing: 28)

EXTRACURRICULAR COURSES AND WORKSHOPS

AI for Medical Diagnosis | **Deeplearning.ai via Coursera**	2023
Comprehensive Gene Therapy Course | **The Union of Iranian Biology**	2023
Principles of Working With Laboratory Animals Online Course | **NIMAD**	2022
Learning How to Learn | **Deep Teaching Solutions via Coursera**	2022
High Throughput Genomics Analysis | **Bioinformatics.ca**	2022
Genetics and IVF | **Mashhad University of Medical Sciences**	2021
Entrepreneurship and Startup | **Mashhad University of Medical Sciences**	2021
How to Write and Publish a Scientific Paper | **École Polytechnique via Coursera**	2021
Creative Thinking: Techniques and Tools for Success | **Imperial College London via Coursera**	2021
Academic Writing Made Easy | **Technische Universität München via EDX**	2021
Statistics And R | **Harvard University via EDX**	2021
RNA-Seq Analysis | **Bioinformatics.ca**	2021
Pathway and Network Analysis of -Omics Data | **Bioinformatics.ca**	2021
R Statistics Essential Training | **LinkedIn Learning**	2021
Introduction to Statistical Analysis With SPSS | **Mashhad University of Medical Sciences**	2020
Introduction to Research | **Mashhad University of Medical Sciences**	2015

REFERENCES

Dr. Mohammad Amin Kerachian (MD. Ph.D)
Associate professor   amin.kerachian@mail.mcgill.ca
- Department of Medical Genetics and Molecular Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

Dr. Amir Avan (Ph.D)
Associate professor   avana@mums.ac.ir
- Department of Medical Genetics and Molecular Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

Dr. Alireza Pasdar (MD. Ph.D)
Associate professor   pasdara@mums.ac.ir
- Department of Medical Genetics and Molecular Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

Dr. Seyed Mehdi Hassanian Mehr (Ph.D)

Associate professor   hasanianmehrm@mums.ac.ir

- Metabolic Syndrome Research Center, Mashhad University of Medical Sciences, Mashhad, Iran.