Azad Khosh

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OBJECTIVE

With a multidisciplinary background spanning molecular and cellular biology, bioinformatics, and robotics, I am pursuing a PhD in the integrated biomedical sciences program at UTHealth Science Center at San Antonio. As a student researcher at the dynamic environment of the Oncinfo Lab and Dr. Boyer's lab, where the boundaries between disciplines blur and innovative solutions emerge, I have the opportunity to expand my horizons in both computational and experimental realms. My goal is to seamlessly integrate these complementary fields, enabling me to tackle interdisciplinary questions and drive advancements in the cutting-edge field of biomedical sciences.

EDUCATION

2017 - 2022

- **BSc in Molecular and Cellular Biology |** Yazd University, Yazd, Iran

2023 - Present

- **Direct Ph.D. in Integrated Biomedical Sciences |** University of Texas Health Science Center at San Antonio, San Antonio, Texas, United States

ACHIEVEMENT & SCHOLARSHIPS

• The Honorable rank for Robotic skeleton invent | The 17th Khwarizmi Young Inventors Award, May 2015

• Fully funded scholarship for Direct Ph.D. in Integrated Biomedical Sciences (35000$ annually)

WORKING EXPERINCE

Sep 2023 – Jan 2024

• **Bioinformatician / Senior Research Assistant** | Texas Biomedical Research Institute, San Antonio, Texas, United States

PROFESSIONAL TRAINING

- R programing | National Institute of Genetic Engineering and Biotechnology, Tehran, Iran
- Introductory Bioinformatics | SUT, Tehran, Iran
- Advanced Bioinformatics 1 | SUT, Tehran, Iran
- Advanced Bioinformatics 2 | SUT, Tehran, Iran
- Machine learning in bioinformatics | SUT, Tehran, Iran

SKILLS

Bioinformatics

- Analysis of Single-cell RNA sequencing data
- Analysis of next generation DNA & RNA sequencing (NGS) data
- Analysis of Whole-genome bisulfite sequencing (WGBS) data
- Analysis of Microarray Gene Expression and methylation Data
- Network analysis methods such as WGCNA and PGCNA
- Network construction such as PPI, co-expression and miRNA-mRNA-lncRNAs
- Network analysis tools such as Gephi and Cytoscape
- Pathway analysis methods such as GSEA and IPA
- Deconvolution methods such as PCA, NPCA and NMF
- Machine learning
- Meta-analysis
- R programing
- Python programing
- Linux scripting

Molecular & cellular biology

- DNA & RNA extraction
- Primer design & PCR
- Agarose and acrylamide gels electrophoresis
- qPCR
- Western Blot
- Cell culture
- MTT assay
- Design and synthesis of drug Delivery systems
- Spectrophotometry
- extracting plant extracts
- Animal husbandry (rodent)
- Live animal Injection, surgery and biopsy (Experimental Techniques certificate, Shahid Sadoughi University of Medical Sciences)

Robotics and IT skills

- Device & Systems: sensors, operators, circuit analysis
- Mechanics: 3D design and 3D printing
- Programming & Software: C & C++, R, Python, Proteus, Fusion 360, AutoCAD, Photoshop (professional level), Adobe Illustrator

Languages

- Kurdish (Native or bilingual proficiency)
- Persian (Native or bilingual proficiency)
- English (Professional working proficiency)

Publications

- Targeting Bromodomain-Containing Protein 9 in Human Uterine Fibroid Cells. Yang, Q., Falahati, A., **Khosh, A**. et al. **Reprod. Sci**. (2024). https://doi.org/10.1007/s43032-024-01608-6

- Bromodomain-Containing Protein 9 Regulates Signaling Pathways and Reprograms the Epigenome in Immortalized Human Uterine Fibroid Cells, Yang Q, Vafaei S, Falahati A, **Khosh A**, Bariani, M.V., Omran M.M, Bai T, Siblini H, Ali M, Chuan He, Boyer, T.G, Al-Hendy, A., **Int. J. Mol. Sci**. 2024, 25, 905. https://doi.org/10.3390/ijms25020905

- Yang, Q.; Falahati, A.; **Khosh, A.**; Mohammed, H.; Kang, W.; Corachán, A.; Bariani, M.V.; Boyer, T.G.; Al-Hendy, A. Targeting Class I Histone Deacetylases in Human Uterine Leiomyosarcoma. **Cells** 2022, 11, 3801. https://doi.org/10.3390/cells11233801

- Yang, Q.; Bariani, M.V.; Falahati, A.; **Khosh, A.**; Lastra, R.R.; Siblini, H.; Boyer, T.G.; Al-Hendy, A. The Functional Role and Regulatory Mechanism of Bromodomain-Containing Protein 9 in Human Uterine Leiomyosarcoma. **Cells** 2022, 11, 2160. https://doi.org/10.3390/cells11142160

- Afrasiabi, A., Alinejad-Rokny, H., **Khosh, A.**, Rahnama, M., Lovell, N., Xu, Z., & Ebrahimi, D. (2022). The low abundance of CpG in the SARS-CoV-2 genome is not an evolutionarily signature of ZAP. **Scientific reports**, 12(1), 2420. https://doi.org/10.1038/s41598-022-06046-5

PUBLICATIONS IN PREPARATION

- Combinatorial ligand-receptor interactions mediate regulatory functions of BATF3+B cells, Rui Wang, Suryavathi Viswanadhapalli, Christian Cervantes, Shuai Wu, Weiwei Luo, Funan He, **Azad Khosh**, Jingwei Wang, Maria Fernandez, Sai Eashan Vankamamidi, Karli Hinton, Uday Patrap, Mustafa Khan, Dariela Perez, Carlos E. Rivera, Harshita Gupta, Fushun Zhang, Zhenqing Ye, Yidong Chen, Xiao-Dong Li, Gangadhara Sareddy, Hong Zan, Yue Li, Exing Wang, Guangming Zhong, Christopher A. Hunter, Tyler Curiel, Zhinan Yin, Booki Min, Theresa L. Murphy, Kenneth M. Murphy, Ross M. Kedl, Evelien Bunnik, Diako Ebrihimi, Siyuan Zheng, Yan Xiang, Ratna Vadlamudi, Paolo Casali, Zhenming Xu, **Nature,** , "under revision"

- Signatures of Mutational Processes in Human Nuclear and Mitochondrial DNA Evolution, Hamidi H**#**, **Khosh A#**, Alinejad-Rokny H, Coorens T, Sanghvi R, J Lindsay S, Rahbari R, Ebrahimi D, **Molecular Biology and Evolution**, "under revision"
#Equal contribution

Conference Publications

- MS moghadam, **A Khosh**, D Ebrahimi, Uncovering virus induced dysregulated processes in cancer and their impact on outcomes, **the American Association for Cancer Research Annual Meeting**, Apr 5-10, San Diego, CA, USA. 2024

- **A. Khosh**, H. Hamidi, H. Rahimi, D. Ebrahimi, Disconnect between APOBEC3 expressions and mutations across cancers, **San Antonio Breast Cancer Symposium**, Dec 6-10, San Antonio, TX, USA. 2022

- H. Hamidi, **A. Khosh**, H. Rahimi, D. Ebrahimi, Profiling of APOBEC3 dysregulation in breast cancer, **San Antonio Breast Cancer Symposium**, Dec 6-10, San Antonio, TX, USA. 2022

- H. Hamidi, **A. Khosh**, H. Alinejad-Rokny, T. Coorens, R. Sanghavi, S. Lindsay, R. Rahbari, D. Ebrahimi, Signatures of mutational processes in human DNA evolution, **American Society for Human Genetics (ASHG)**, Oct 25-29, Los Angeles, CA, USA. 2022

- **A. Khosh**, H. Rahimi, R. Rodriguez, K. Jackson-Jones, M. Rzhetskaya, J. F. Hutquist, D. Ebrahimi, Donor-specific anti-HIV/SIV immunity mediate by APOBEC3 enzymes, **Twenty-Sixth West Coast Retrovirus Meeting**, Oct 6-8, Palm Spring, CA, USA. Talk 2022

- **A. Khosh**, R. Rodriguez, D. Ebrahimi, APOBEC3G mRNA splicing defect across nonhuman primate and its role in differential hypermutation of SIV sequences, **CSH Retroviruses Meeting**, May 23-28, **Cold Spring Harbor**, NY, USA. 2022

- Zohrab Beigi Y, Sabie S, **Khosh A**, Shelling A, Kargar S, Falahati A , Comprehensive meta-analysis and differential network analysis of breast cancer, Dec 1-2 , **International Conference on Human Genetics and Genomics**, Yazd, Iran, 2021

- **Khosh A**, Rodriguez R, Ebrahimi D, Distinct APOBEC3-Induced Hypermutation Signatures in HIV and SIV, **CSH Retroviruses Conference**, May 25-28, **Cold Spring Harbor**, NY, USA, 2021

- **A. Khosh**, R. Rodriguez, D. Ebrahimi, Substantial differences between human and nonhuman primate antiviral immunities mediated by APOBEC3 enzymes, **Texas D-CFAR Annual Conference**, March 30, Virtual. Talk 2021

- **Khosh A**, Identification of key gene modules and hub genes associated with the fast development of Amyotrophic lateral sclerosis by weighted gene co-expression network analysis (WGCNA), ***8th basic and clinical neuroscience congress:*** Iran University of Medical Sciences, Dec 18 ,Tehran, Iran, 2019

Projects

University of Chicago, University of Texas Health, Yazd university

- Targeting Class I Histone Deacetylases in Human Uterine Leiomyosarcoma

I contributed to this project by conceiving the bioinformatics part of project and conducting the analysis.

University of Chicago, University of Texas Health, Yazd university

- Targeting Bromodomain-Containing Protein 9 in Human Uterine fibroids

I contributed to this project by conceiving the bioinformatics part of project and conducting the analysis.

University of Chicago, University of Texas Health, Yazd university

- Targeting BET family of bromodomain proteins in Human Uterine Leiomyosarcoma

I contributed to this project by conceiving the bioinformatics part of project and conducting the analysis.

University of Chicago, University of Texas Health, Yazd university

- Targeting Bromodomain-Containing Protein 9 in Human Uterine Leiomyosarcoma

I contributed to this project by conducting the analysis.

Texas biomedical research institute, UNSW Sydney

- Signature analysis of Mutational Processes in Human DNA Evolution

I contributed to this project by conducting the analysis.

Texas biomedical

- Analysis of genomic composition of coronaviruses to

research institute, UNSW Sydney	address the question whether the human Zinc finger antiviral protein ZAP drives CpG suppression in SARS-CoV-2 and other related viruses? **I contributed to this project by conducting the analysis.**
Texas biomedical research institute	• Identification and analysis of viruses hypermutated by human APOBEC3 enzymes in order to discover viral determinants of hypermutation and inactivation by cytosine deaminase proteins of the human innate immune system. **I contributed to this project by conducting the analysis.**
Texas biomedical research institute	• Identification and analysis of the simian immunodeficiency viruses (SIVs) hypermutated by APOBEC3 enzymes in non-human primates. **I contributed to this project by conducting the analysis.**
University of Auckland, Yazd university	• Prediction of oocyte developmental competence using transcriptomic profile in cumulus cells entoured the oocyte of Iranian patients with polycystic ovary syndrome compared to healthy women **I contributed to this project by conducting the analysis.**
University of Auckland, Yazd university	• Integrated bioinformatics analysis of Endometrial cancer **I contributed to this project by conceiving the project and conducting the analysis.**
University of Auckland, Yazd university	• Comprehensive meta-analysis and differential network analysis of breast cancer **I contributed to this project by conceiving the project and conducting the analysis.**
Yazd university	• Identification of chemo-resistance hub genes associated with breast cancer **I contributed to this project by conceiving the project and conducting the analysis.**
Yazd university	• Integrated bioinformatics analysis to reveals genes associated with Uveal melanoma metastasis. **I contributed to this project by conceiving the project and conducting the analysis.**
Yazd university	• Construction of a machine learning model for the diagenesis of uterine fibroids using transcriptomic and epigenomic markers. **I contributed to this project by conceiving the project and conducting the analysis.**
University of Kentucky, Yazd university	• Analyzing plant-fungi interactions through network

analysis.

I contributed to this project by conceiving the project and conducting the analysis.

Professional Affiliation

09/2019 - 09/2020

Secretary of the Brain Society, Yazd University

03/2018 – 03/2019

Executive Member of the 1th to the 3rd Genetic Symposium, Yazd University

Volunteer Experience

11/2021 - 01/2022

Bioinformaticians, Yazd stem cell and regenerative medicine institute

03/2018 - 06/2018

Research Technologist and Genetics Technician, Yazd University

Organization of Workshop:

• **Instructor** in Workshop "Structural Bioinformatics: Visualization and Molecular Modelling" held on September 21-25, 2020 organized by Bioinformatics Society, Yazd university

• **Instructor** in Workshop "R for Bioinformatics" held on March 21-22, 2020 organized by Bioinformatics Society, Yazd university

List of workshops attended

• International workshop on Meta-genomics, January 25-31, 2020, Decode Life Bioinformatics training institute, India

• Real-time PCR workshop: December 10, 2019, Yazd university, Yazd, Iran

• Scanning Electron Microscopy Workshop: January 31, 2019, Yazd university, Yazd, Iran

• Bioinformatics analysis of Cloning & Genetics Engineering workshop, August 27, 2018, GenIranLab, Tehran, Iran

• systematic review and meta-analysis workshop, September 11, 2018, Tehran University of Medical Sciences, Tehran, Iran

• PCR and enzyme digestion workshop, November 22&23, 2018, Yazd University, Yazd, Iran

• Handling laboratory animals workshop, November 9, 2018, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

• Blood and Plants DNA Extraction workshop: September 25&26, 2017, Yazd University, Yazd, Iran

Scientific Conferences Attended

• Yazd International Congress and Student Award on reproductive Medicine: April 19-21, 2019, Yazd, Iran

• Fourth Iranian Brain Mapping Symposium (ISBM2018): October 10&11, 2018, Tehran University of Medical Sciences, Tehran, Iran

References

• **Dr. Habil Zare**
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