Maral Molaei

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Professional Summary

Biomedical scientist with extensive theoretical and bench training in cellular and molecular biology, genetics, immunology, immunometabolism, bioinformatics, microbiology, biochemistry, and insect husbandry. More than 10 years of experience in research. More than three years of lecturing, as well as training several undergraduate and graduate students at the bench. Scientific writing experience, with peer-reviewed publications and awarded competitive national grant.

Skills

Bacterial culture
Bradford protein assay
BSL-2 laboratory biosafety
Cell culture
Chromatin Immunoprecipitation (ChIP)
Cloning
Confocal microscopy
CRISPR/Cas9 genome editing
Data/statistical analysis (JMP Pro, GraphPad Prism softwaes)
De novo genome assembly
DNA isolation
Drosophila and Anopheles husbandry
ELISA
Fluorescent microscopy
Gel electrophoresis
Immunostaining
Light microscopy
Linux
Lipid biochemistry
Metabolite measurement
Micro-injection
PCR
Protein expression
qPCR/RT PCR
RNA isolation
RNA sequencing
SDS-PAGE
Western blot
Transfection

Work History

10/2020 to present — Postdoctoral Research Associate | Texas A&M University
College Station, TX

- ***The role of the circadian clock in the behavior of the malaria mosquito Anopheles coluzzii;*** Designed sgRNA sequence, implemented embryo microinjection and CRISPR/Cas9 genome editing technology to create transgenic mosquitoes, knock out CLOCK gene, in order to disrupt circadian clock and study the resulting behavior.

07/2021 – 09/2020 — Postdoctoral Research Associate | Texas A&M University
Bryan, TX

- ***The role of EphA1 receptor in Mycobacterium tuberculosis infection;*** Contributed to RNA extraction, bioinformatics analysis, and pathway enrichment analysis of RNA sequencing data from EphA1 mutant THP1 (macrophage) cells and wild type THP1 cells in response to mycobacterium infection.
- ***Studying the effectiveness of tuberculosis vaccine against COVID-19****;* performed ELISA on human blood and plasma samples to measure the IgA, IgM, and IgG antibodies in individuals vaccinated with TB vaccine versus unvaccinated individuals. Contributed to designing protein expression system to produce SARS-Cov2 antigens in human cells.

01/2014 -12/2019 — Research Assistant | Texas A&M University
College Station, TX

- ***Studying the interaction of immune and metabolic signaling pathways using Drosophila as a model organism,*** Designed, developed, and performed multiple assays including metabolite measurement, creating transgenic animals, tissue dissection and microscopy, qPCR, bioinformatics, cloning, western-blot, bacterial culture, immunostaining; prepared an awarded grant proposal.

- ***Genome-wide association study for feed efficiency and growth traits in U.S. beef cattle;*** Contributed to QTL alignment and quality control analyses for positional candidate genes.
- ***De novo genome assembly of macaw parrot,*** Performed DNA extraction, and de novo assembly of Illumina reads (NGS).

01/2011 – 12/2012 Research Assistant | Pasture Institute of Iran
Tehran - Iran

- ***Cloning and expression of the common form of Toll-like Receptor 2 (TLR-2) and TLR-2 Arg-753-Gln in HEK293 cells and comparing their signaling;*** Designed and performed experiments to express TLR2 protein in HEK293 cells, including RNA extraction from human blood samples, designing primers, designing and cloning the protein expression construct, transfection of HEK293 cells.

09/2009 – 12/2012 Lecturer | Islamic Azad University
Tehran - Iran

- ***Biochemistry, cellular and molecular biology, molecular biology, cellular biology laboratory;*** Prepared the course materials according to university syllables, prepared the exams, graded the exams.

Education

2014 -2019 Ph.D.: Biomedical Sciences
Texas A & M University-College Station - Texas

2008 -2012 Ph.D. Candidate: Cellular and Molecular Biology (Incomplete)
Islamic Azad University, Science & Research Branch – Tehran, Iran

2004 -2006 M.S.: Cellular and Molecular Biology
Islamic Azad University, Research and Science Branch – Tehran, Iran

1998 -2003 B.S.: Microbiology
Islamic Azad University, Research and Science Branch – Tehran, Iran

Awards

- Large Grant Recipient Award, College of Veterinary Medicine and Biomedical Sciences, Texas A&M University, 2017.
- Pre-doctoral Fellowship, American Heart Association, 2016
- Ranked 1st in the nationwide entrance exam of Cellular and Molecular Biology Ph.D. program of Islamic Azad University, 2006.
- Ranked 4th in the nationwide entrance exam of Cellular and Molecular Biology M.Sc. program of Islamic Azad University, 2004.

Publications

- Mycobacterium tuberculosis Infection Modulates Metabolic, Signal Transduction and Regulatory Pathways in Macrophages through the Host Receptor EphA1. (In Preparation).
- Dietary Adaptation of Microbiota in Drosophila Requires NF-κB-Dependent Control of the Translational Regulator 4E-BP. Cell Reports. June 2020. https://www.cell.com/cell-reports/fulltext/S2211-1247(20)30716-6.
- NF-κB Shapes Metabolic Adaptation by Attenuating Foxo-Mediated Lipolysis in Drosophila. Developmenatal Cell. May 2019. https://www.cell.com/developmental-cell/fulltext/S1534-5807(19)30279-5.
- Genome-wide Association Study for Feed Efficiency and Growth Traits in U.S. Beef Cattle. BMC Genomics. May 2017. https://bmcgenomics.biomedcentral.com/articles/10.1186/s12864-017-3754-y.
- Effect Of Dibenzo-18-Crown-6 on Hematopoietic Cells Colony Formation of Mouse Bone Marrow. Medical Science Journal of Islamic Azad University. January 2009. https://www.magiran.com/paper/599413/?lang=en.