Kiana Lee Martinez

Postdoctoral Research Associate
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Education

- **Doctor of Philosophy in Genetics** **August 2021**
  University of Arizona, Tucson, AZ

- **Bachelor of Science in Anthropology** **May 2016**
  University of Arizona, Tucson, AZ

Research Experience

College of Pharmacy, University of Arizona
Postdoctoral Researcher, August 2021-present
Advisor: Jason Karnes, PharmD, PhD

- The lab's primary area of research is cardiovascular pharmacogenomics, specifically investigating the utility of genetic polymorphisms to predict toxicities of cardiovascular drugs. We employ a translational approach to investigate pharmacogenomic associations using observational studies, functional genomics techniques, and prospective clinical trials. Methods and analyses I have conducted include genomic imputation and phasing, estimating heritability, and genome-wide association studies. For data management, establishing bioinformatic pipelines, and conducting analyses I utilize R, Python, HPC, and the command line.

College of Medicine, University of Arizona
Graduate Researcher, 2017-2021
Advisor: Christina Laukaitis, MD, PhD

- My primary project focused on identifying genetic risk factors associated with the hypermobile subtype of Ehler-Danlos Syndrome. My responsibilities included interacting with patients, developing and executing relevant experiments, overseeing and mentoring undergraduate researchers, writing and applying to grants, and manipulating exome and genome sequence data with bioinformatics tools. I performed genetic analyses such as linkage analysis and assembled bioinformatics pipelines on high performance computing (HPC) clusters that utilize software such as SAMtools, BAMtools, VCFtools, Picard Tools, GATK, ANNOVAR, and R. A secondary project I worked on focused on investigating evolutionary genetics and genome instability using mouse models. As part of my lab work, I handled mice, extracted DNA and RNA, created cDNA libraries, conducted PCR, conducted real-time quantitative PCR, and prepared samples for both genome sequencing and RNA-sequencing.

BIO5 Institute, University of Arizona
Graduate Research Rotation, Spring 2017
Advisor: Casey Romanoksi, PhD

- The lab’s research focused on identifying how cells achieve context-appropriate expression patterns and signal responsiveness by utilizing experimental and computational methods. During

my rotation in this lab, I worked on identifying eQTLs from RNA-seq data collected from aortic endothelial cell lines. I used the software program Probabilistic Estimation of Expression Residuals (PEER) through R.

Arizona Respiratory Center, University of Arizona
Graduate Research Rotation, Fall 2016
Advisor: Donata Vercelli, PhD

- The lab's research focused on investigating genetic and environmental determinants of complex lung diseases such as asthma. I explored possible protective effects of dust exposure by exposing dust collected from Amish homes to mice models and observed lymphocyte expression using flow cytometry. I also started DNA methylation profiles for the IL4 human gene locus.

University of Arizona Genetics Core
Undergraduate Researcher
Advisor: Michael Hammer, PhD

- My work in this lab focused on two topics: 1) identifying regulatory elements of the SCNIA gene that is known to cause epilepsy, and 2) identifying genes that underlie human adaptation to climatic stress, with a focus on genetic changes that lead to long-term cold tolerance. I conducted wet lab work including designing primers and running PCRs.

Publications

- Giles J.B, Steiner H.E., Rollin J., Schaffer C.M., Momozawa Y., Mushiroda T., Inai C., Selling K., Thiele T., Pouplard C., Heddle N.M., Kubo M., Miller E.C., **Martinez, K.L.**, . . . Karnes J.H. (2022). Genome-wide association study of platelet factor 4/heparin antibodies in heparin-induced thrombocytopenia. Blood Advances. 6(14), 4137-4146.
- Karnes J., Rollin J., Giles J., **Martinez K.L**., Steiner H., Shaffer C., . . . Roden D. (2022). ABO O blood group as a risk factor for platelet reactivity in heparin-induced thrombocytopenia. Blood. 140(3), 274-284.
- **Martinez K.L.**, Mauss C., Andrews J., Saboda K., Huynh J., Sanoja A., . . . Laukaitis C. (2021). Subtle differences in autonomic symptoms in people diagnosed with hypermobile Ehlers–Danlos syndrome and hypermobility spectrum disorders. American Journal of Medical Genetics. Part A, 185(7), 2012-2025

Presentations

- **Martinez**, **Kiana**, Kathylynn Saboda, Corina Mauss, Peter Byers, Christina Laukaitis (April 2019). Patients Diagnosed with hEDS and G-HSD Have Their Quality of Life Similarly Disrupted by GID Symptoms. Poster presented at the 2019 ACMG Annual Meeting, Seattle, WA.
- **Martinez**, Kiana L. (May 2018). Pilocarpine Induces Salivary *Abp* Gene Expression in Mouse Models. Poster presented at the IMSD SWIMRS Conference, San Diego, CA.

Grants, Honors, and Awards

- 3R01HL158686-02S1 (NIH/NHLBI), "Leveraging the Microbiome, Local Admixture, and Machine Learning to Optimize Anticoagulant Pharmacogenomics in Medically Underserved Patients - Supplement", Key Personnel, $106,845, 08/2022-07/2023
- Ehlers-Danlos Society, “Analysis of Genome Sequence Data from the HEDGE Study”, $231,225, 2021-2022
- Ehlers-Danlos Society, “Examining global gene expression in cultured cells or affected tissues derived from individuals with hypermobile Ehlers-Danlos syndrome”, $69,020, 2021-2022
- Zukowski Travel Award, 2019
- Summer Institute in Statistical Genetics registration and travel scholarship, 2018
- Sky School Graduate Fellowship, 2017
- National Institutes of Health/Initiatives to Maximize Student Development Scholars program, 2016
- UA Honors College Outstanding Junior Award, 2014
- Byron Cummings Memorial Scholarship, for Research, 2014
- William Shirley Fulton Scholarship, 2014
- Traditions, Transitions, and Treasures Scholarship, 2014
- Magellan Scholarship, 2013 & 2014
- The Arizona Board of High Honors Tuition Scholarship, 2011
- Wildcat Excellence Tuition Award, 2011

Teaching and Mentoring Experience

- **University of Arizona: Applied Pharmacogenetics and Precision Medicine (PHPR 887)**
  Guest Lecturer, Fall 2022
  I guest lectured on Population Genetics for this graduate level pharmacology class covering an introduction and review of key population genetic topics including Hardy Weinberg equilibrium and linkage disequilibrium.

- **University of Arizona Science: Sky School**
  Instructor, Fall 2017 – Summer 2019
  As a Sky School instructor, I taught inquiry-based science education to Arizona K-12 students using the unique sky island environment in the Catalina Mountains. We focused on core University of Arizona science areas such as sky island ecology, geology, and astronomy and met Arizona State and Next Generation Science standards.

- **University of Arizona: Fundamental Genetic Mechanisms - from Molecules to Genomes (CMM 518)**
  Teaching Assistant, Fall 2022

I was a teaching assistant in this graduate level class that focused on the topic of genetic mechanisms and genetic interactions, and its relation to developmental biology, cell physiology, evolution, and disease. This course covered advanced concepts in gene function, genetic interactions, and genetic analyses and manipulations that are commonly in use in research laboratories, or that go awry in human disease.

- **University of Arizona – Introduction to Cellular and Molecular Biology Laboratory**
  Laboratory Instructor, Fall 2018
  As a laboratory instructor for Molecular and Cellular Biology, I taught two 3-hour undergraduate laboratory classes that were each held once a week. I introduced and taught introductory topics on cellular and molecular biology, and guided students through laboratory activities.

- **University of Arizona Science: Sky School**
  Research mentor, Fall 2017 – Spring 2018
  As a Sky School research mentor, I mentored several middle school students throughout a period of several months in their creation and execution of field-based science projects that were presented at the Southern Arizona Regional Science and Engineering Fair (SARSEF).

Skills

- **Software, Databases, and Computational Infrastructure:** Python, R, HPC, GitHub, TopMED Imputation Server, GCTA-GREML, DistillerSR, SAMtools, BAMtools, VCFtools, Picard Tools, PLINK, GATK, ANNOVAR, BioDiscovery - Nexus Copy Number, Cyverse® – Atmosphere, Data Store, & Discovery Environment, UCSC Genome Browser, ABI Prism® 7000 Sequence Detection Studio, CLC Sequencer, SeqTrace, Probabilistic Estimation of Expression Residuals (PEER)
- **Biochemistry/Genetics**: spectrometry, conventional PCR, gel electrophoresis, real-time quantitative PCR, whole genome and exome sequencing, RNA and DNA isolation, cDNA synthesis
- **Mouse care**: handle and restrain, weigh, administer injections, eye-wash, mouth-wash, anesthetize, perform dissections
- **General Laboratory**: pipette, weigh, centrifuge, wash/clean glassware, prepare buffers
- **Laboratory equipment**: light microscope, centrifuges, water baths, precision balance, volumnetric glassware, nanodrop

Current Certifications:

- CITI Program – Human Research, Native American Research, Working with the IACUC, Essentials for IACUC Member, Reducing Pain and Distress in Laboratory Mice and Rats, Working with Mice in Research Setting, Aseptic Surgery, Antibody Production in Animals, Human Research, IACUC Community Member, IACUC Chair

- Preventing Discrimination and Harassment for Nonsupervisory Employees Certification by the University of Arizona (completed in 2018)
- NIH Responsible Conduct of Research (completed in 2018)
- Summer Institute of Statistical Genetics (SISG), University of Washington – Quantitative Genetics (July 2018)
- Summer Institute of Statistical Genetics (SISG)), University of Washington – Mixed Models in Quantitative Genetics (July 2018)