Adam James Orr

Address: 3302 N. 7th St. Unit 162. Phoenix, AZ 85014
Phone: (480) 415-6323
E-mail: ajorr1@asu.edu
Github: www.github.com/adamjorr
Orcid: orcid.org/0000-0001-9074-4799
Website: www.adamjorr.com

Education

Arizona State University, Tempe AZ 85281

Ph.D, Molecular and Cellular Biology, December 2020.
- Dissertation: Methods for Detecting Mutations in Non-model Organisms

Bachelor of Science, Molecular Biosciences and Biotechnology, May 2015

Bachelor of Science, Mathematics, May 2015
- Minor, Biochemistry
- Summa Cum Laude
- Undergraduate Thesis: Gene Families in Cancer: Using phylogenetic data to examine an atavistic model of cancer

Research Experience

Research Assistant, Cartwright Lab, August 2014-Present

Biodesign Institute, Arizona State University

KBBQ - Kmer-based Base Quality Score Recalibration: A reference-free method for base quality score recalibration

Somatic Mutation in Eucalyptus – Development of a method for detecting somatic mutants in *Eucalyptus meliodora* and matching the mutations to the topology of the tree.

SISRS – SNP Identification from Short Read Sequences. Software that rapidly identifies phylogenetically informative sites from next-gen whole-genome sequencing data.

Research Assistant, Davies Lab, August 2014-May 2015

Department of Physics, Arizona State University

Atavistic Model of Cancer – Developing and testing a model of cancer development. Focuses on the similarities of cancer cells with evolutionarily ancient organisms.

Research Associate, March 2014-January 2015

SIO2 Nanotech, LLC. Scottsdale, AZ

IP transfer from Herbots Lab, product development, and preparation for FDA approval

AVNE – A process to permanently prevent fogging on flat glass surfaces

Research Assistant, Herbots Lab, December 2012-August 2014

Department of Physics, Arizona State University

VitreOx – A semi-permanent medical device for preventing fogging on endoscope lenses.

HemoClear – A medical device for preventing blood occlusion on lenses

Research Assistant, Kumar Lab, April 2012-August 2014

Center for Evolutionary Medicine and Informatics, Biodesign Institute, Arizona State University,

Fly Express – Annotation and analysis of gene expression in *Drosophila melanogaster*

MyFX – Bug testing

MEGA – Bug testing

Computing Experience
Unix, Bash Scripting, R, Tidyverse, Python, Numpy, Pytest, C++, htslib, Java, Matlab, Perl
Unit testing and continuous integration (experience with CircleCI)
Code coverage analysis (experience with codecov.io)

Teaching Experience
Teaching Assistant, BIO598 Genomic Analysis (Fall 2019, Spring 2020)
Teaching Assistant, MIC206 Introduction to Microbiology Lab (Spring 2019)
Teaching Assistant. BIO340 General Genetics (Fall 2015, Fall 2016, Fall 2017, Fall 2018)
Lead Instructor. Analyzing Next Gen Sequencing Data (ANGUS) workshop. Davis, CA. (July 2 - 14, 2018)
Instructor - Data Carpentry Workshop. https://code.nimahejazi.org/2018-05-03-LBNL/ (May 3-4, 2018)
Helper. ANGUS workshop. Davis, CA. (June 26 – July 8 2017)
Instructor – Software Carpentry Workshop (May 23-24 2016)
http://www.adamjorr.com/2016-05-23-BiodesignASU/

Publications
Adam J. Orr, Amanda Padovan, David Kainer, Carsten Külheim, Lindell Bromham, CarlosBustos-Segura, William Foley, Tonya Haff, Ji-Fan Hsieh, Alejandro Morales-Suarez, Reed A. Cartwright, Robert Lanfear (2020). *A phylogenomic approach reveals a low somatic mutation rate in a long-lived plant.* https://doi.org/10.1098/rspb.2019.2364

Cisneros L, Bussey KJ, Orr AJ, Miočević M, Lineweaver CH, et al. (2017) *Ancient genes establish stress-induced mutation as a hallmark of cancer.* PLOS ONE 12(4): e0176258. https://doi.org/10.1371/journal.pone.0176258

Posters and Presentations
- KBBQ: A reference-free method for base quality score recalibration. November 7, 2019. *Genome Informatics 2019*. Poster. Cold Spring Harbor, NY.
- KBBQ: A reference-free method for base quality score recalibration. October 2, 2019. *AZBio Awards 2019*. Poster. Phoenix, AZ
- Reference-free Base Quality Score Recalibration for Sensitive Detection of Mutations. March 22, 2019. *Biodesign Fusion*. Poster. Phoenix, AZ.
- Calculating a non-model Eucalyptus Individual's Somatic Mutation Rate. September 25, 2018. *Evolutionary Biology Graduate Student Symposium*. Oral presentation. Tempe, AZ.
- Calculating a non-model Eucalyptus Individual's Somatic Mutation Rate. September 18, 2018. *Molecular and Cellular Biology Colloquium*. Oral presentation. Tempe, AZ.

- Calculating a non-model *Eucalyptus* Individual's Somatic Mutation Rate. Feb 18, 2018. *Molecular and Cellular Biology Colloquium.* Oral presentation. Tempe, AZ.
- Patterns of mutation match physical branching topology in *Eucalyptus.* June 27, 2017. *Evolution*. Portland, OR.
- Patterns of somatic mutation correspond to physical topology in *Eucalyptus.* April 7, 2017. *Biodesign Fusion Science Retreat*. Poster. Carefree, AZ.
- Detection of Somatic Mutations in *Eucalyptus melliodora.* April 8, 2016. *Molecular and Cellular Biology Colloquium*. Oral presentation. Tempe, AZ.
- Phylogenies derived from somatic mutation agree with physical topologies in Eucalyptus. July 3-7 2016. *Society for Molecular Biology and Evolution*. Poster. Gold Coast, Australia.
- Adam Orr. "Detecting somatic mutations in *Eucalyptus melliodora*." March 4 2016. *Graduate Brownbag Seminar Series*. Oral presentation. Tempe, AZ.
- A.J. Orr, C.F. Watson, N. Herbots, E.J. Culbertson, A.J. Acharya, S.D. Whaley, M. Matiski, R.B. Bennett-Kennett, A.M. Murphy. "VitreOx™: A Super-hydrophilic Thin Fluid Film Device (TFFD™) Medical Accessory to Eliminate Fogging on Surgical Lenses" June 16-18 2014. *TechConnect World Conference and Expo*. Oral Presentation. National Harbor, MD.
- A.J. Orr, E. R. Morgan, A. J. Acharya, B. W. Hughes, A. S. Benitez, T. T. Kutz, D. A. Sell, R. B. Bennett-Kennett, A. M. Murphy, N. Herbots, C.F. Watson. "Controlling Condensation on Lens Surfaces with A Biologically Compatible Polymeric Mesh" April 4 2014. *Eleventh Annual Physics Undergraduate Research Symposium*. Oral Presentation. Tempe, AZ.
- A.J. Orr. "Gene Families in Cancer: Using phylogenetic data to examine an atavistic model of cancer" February 27 2014. *PS-OC Think Tank*. Oral Presentation. Tempe, AZ
- R.B. Bennett-Kennett, A.M. Murphy, A.J. Acharya, B.W. Hughes, E.R. Morgan, A.J. Orr, A.S. Benitez, T.T. Kutz, D.A. Sell, N.Herbots, C.F. Watson. "Effects of Blood Proteins on Condensation on Surgical Lenses" April 11 2013. *Celebrating Honors Symposium of Research and Creative Projects*. Poster. Tempe, AZ
- Sudhir Kumar, Ivan Montiel, Qian Sun, MichaelMcCutchan, Bremen Braun, Adam Orr, Stuart Newfeld, Jieping Ye. "myFX: Turn-key software for laboratory desktops that analyzes spatial patterns of gene expression in Drosophila embryos." April 3-7 2013. *54th Annual Drosophila Research Conference*. Poster. Washington, DC
- N. Herbots, A. M. Murphy, A. Acharya, R. B. Bennett-Kennett, B. W. Hughes, E.R Morgan, A.J. Orr, C. F. Watson, R.J. Culbertson E.J. Culbertson. "Modeling Condensation, Hydro- and Pepto-affinity of Surfaces in Medical Implant Devices and Surgical Lenses: Effect of Blood Proteins". April 1-5 2013. *2013 Materials Research Society Spring Meeting & Exhibit.* Presentation by N. Herbots. San Francisco, CA
- R. B. Bennett-Kennett, A. M. Murphy, D. A. Sell, B. W. Hughes, A. A. Acharya, T. T. Kutz, A. J. Orr, E. R. Morgan. "Modeling the Effect of Blood Proteins on Condensation and the Hydro- and Pepto-affinity of Surfaces: Medical Implant Devices and Surgical Lenses" Feb 15-16 2013. *Annual meeting of the AAAS*. Presentation by R.B. Bennett-Kennett. Boston, MA

Academic and Extracurricular Honors
- Graduate College Completion Fellowship (August 2020)
- Graduated Summa Cum Laude (May 2015)

- Graduate of Barrett, the Honor's College at Arizona State University (May 2015)
- Joyce M. Foster Larson Scholarship (August 2014)
- Dean's List (Fall 2011, Spring & Fall 2012, Spring & Fall 2013, Spring & Fall 2014)
- Arizona Board of Regent's High Honors Tuition Waiver (2011-2015)
- National Merit Commended Student (2011)
- Advanced Placement National Scholar (2011)
- Distinguished Delegation of Collegiate National Model United Nations (March 2011)

Service
Associate Editor at ASU's *The Triple Helix*, November 2013-August 2014
Volunteer at Arizona State University's Night of the Open Door, 3/2013, 3/2015, 2/2016, 2/2017
Contributor to ASU's Ask a Biologist program
Open Source Contributor at www.github.com
Software Carpentry Certified Instructor