Eleisha L. Jackson

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EDUCATION

Ph.D., Ecology, Evolution and Behavior Expected August 2016
University of Texas at Austin, Austin, TX

Bachelors of Science, Mathematics May 2012
Minors in Biology, Art History
University of Arizona, Tucson, AZ

RESEARCH EXPERIENCE

Graduate Researcher Fall 2012–Present
University of Texas at Austin, Austin, TX
Principal Investigator: Claus Wilke, Ph.D.
Project 1: Amino-acid site variability among natural and designed proteins

- Analyzed the ability of current protein design software to design proteins that recapitulate observed sequence patterns in natural proteins
- Worked as a team with another lab in California to design proteins and analyze results
- Summarized project results and helped write the research paper for publication as the first author
- Presented the results at a conference in the form of a poster

Project 2: Computational Prediction of Virus-Host Protein-Protein Interactions

- As part of a multi-lab government funded project, I collaborated with three other labs to investigate the evolution of viruses that cause hemorrhagic fever and death in humans.
- Developed a method to make computational predictions of virus-host protein binding
- Worked with experimental labs to validate computational protocol
- Wrote lab quarterly reports that were integrated into a project-wide report for funding agency reports

Project 3: Relationship between thermodynamic constraints and variation of evolutionary rates among sites

- Worked with an international collaborator to link protein thermodynamic changes to protein evolution.
- Generated data by performing sequence analysis on proteins using biological software

Undergraduate Researcher September 2010–June 2012
Institution: University of Arizona, Ecology and Evolutionary Biology, Tucson, AZ
The Effect of Translational Errors on the Evolvability of a Protein
Principal Investigator: Joanna Masel, Ph.D.

- Investigated whether selection against translational errors leads to greater thermostability and increased evolvability.
- Gained experience testing hypotheses, higher-level programming, and use of the thermostability prediction software FoldX

Summer National Research Experience for Undergraduates Program (NREUP) Summer 2010
Institution: University of Texas at Arlington, Mathematics, Arlington, TX
Principal Investigator: Tuncay Aktosun, Ph.D.
Exact Solutions to the Non linear Schrödinger equation

- Investigated soliton solutions to the nonlinear Schrödinger equations
- Analyzed exact solutions to various nonlinear partial differential equations
- Gained experience analyzing solutions to partial differential equations, use of the software Mathematica and LaTex.

UA/NASA Space Grant Undergraduate Research Intern — Fall 2011–Spring 2012
Institution: University of Arizona, Aerospace and Mechanical Engineering, Tucson, AZ
Principal Investigator: Cho Lik Chan, Ph.D.

- Developed computer programs to solve mathematical models with differential equations
- Gained experience using MATLAB to solve mathematical models

Publications

J. Echave, EL. Jackson, CO. Wilke (in press). Relationship between protein thermodynamic constraints and variation of evolutionary rates among sites. *Physical Biology.*

Shahmoradi A, Sydykova DK, Spielman SJ, Jackson EL, Dawson ET, Meyer AG, Wilke CO. (2014) Predicting evolutionary site variability from structure in viral proteins: buriedness, flexibility, and design. *J Miol. Biol.*

Jackson EL, Ollikainen N, Covert III AW, Kortemme T, Wilke CO. (2013) Amino-acid site variability among natural and designed proteins. *PeerJ* 1:e211

Presentations

Comparing Site Variability Between Natural and Designed Proteins — August 2013
Poster Presenter, **BEACON Congress 2013**
Host Institution: Michigan State University, East Lansing, MI

Numerical Simulation of Convection — April 2012
Presenter, **Statewide Arizona NASA Space Grant Symposium**
Host Institution: University of Arizona, Tucson, AZ

The Effect of Translational Errors on the Evolvability of a Protein — June 2011
Poster Presenter, **Evolution 2011**
Host Institution: University of Oklahoma, Norman, OK

The Effect of Translational Errors on the Evolvability of a Protein — April 2011
Poster Presenter, **EEB Undergraduate Poster Symposium 2011**
Host Institution: University of Arizona, Tucson, AZ

Exact Solutions to the Non linear Schrödinger equation — July 2010
Presenter, **University of Texas at Arlington LSAMP Conference 2010**
Host Institution: University of Texas at Arlington, Arlington, TX

NON-RESEARH EXPERIENCE

CNS 101 Lead Facilitator, University of Texas at Austin, Austin, TX — August 2014–Present

- Developed and taught lesson plans to a group of freshman students about campus resources, time-management, careers, and college adjustment and developed strategies to improve CNS 101
- Worked with an undergraduate peer facilitator to develop a curriculum that helped students learn technical computer science (CS) skills while learning general skills such as study strategies
- Led weekly meetings of a group of students during the Fall semester and supervised extended bi-weekly meetings during the Spring where students developed their own CS project to execute

Graduate Teaching Assistant - Intro to Computational Biology FRI (BIO 321G) Spring 2013, 2014
University of Texas at Austin, Austin, TX
Claus Wilke, Professor and Art Covert, Post-doctoral Fellow and Research Educator

- Assisted students in learning biological concepts and computational skills such as python programming
- Helped students learn research skills such as experimental design, technical writing and presentation
- Assisted students in learning basic biological concepts and computational skills such as python programming and basic statistical tests
- Guided students through weekly computational projects and graded student weekly lab reports

Graduate Teaching Assistant - Laboratory Experiments in Biology (BIO 206L) Fall 2012
University of Texas at Austin, Austin, TX

- Taught students basic standard lab practices as well as a variety of basic laboratory techniques
- Gave weekly quizzes to students on previous material to assess learning
- Attended weekly meetings to help develop methods of teaching students techniques
- Instructed and assessed students weekly on standard lab practices and basic lab techniques
- Graded assistants and communicated feedback to students to help improve their performance

University of Arizona College of Science (CNS) Ambassador Fall 2010–Spring 2012
University of Arizona, Tucson, AZ

- Part of a group of students in the CNS nominated by CNS faculty
- Engaged with incoming students and high students and discussed the various majors in the CNS as well as the general benefits of attending college.
- Held events to engage the greater Tucson community with science

NREUP (National Research Experience for Undergraduate Program) Scholar Summer 2010
University of Texas at Arlington, Arlington, TX

- Mentor in Math Camps at University of Texas at Arlington (July 1, 15, 28 of 2010)
- Led mathematics activities for middle/high school students and encouraged them to go to college
- Informed students about majoring in STEM (Science, Engineering, Technology, Mathematics) fields

Tutor Spring 2010
Strategic Alternative Learning Techniques (SALT) Center
University of Arizona, Tucson, AZ
Sarah Holmes, Coordinator, Learning Support Services

- Tutored Introductory Biology, Mathematics and Art History to students with learning and attention challenges.

TECHNICAL SKILLS

Programming Languages

- Worked in several programming languages: Python, C, and R

Software

- Proficient in Microsoft Office (Excel, Powerpoint, Word)
- Software and biological packages: Rosetta, FoldX, and Biopython, git for version control and project collaboration

- Experience writing research summary reports using Word and LaTex

Operating Systems

- Experience with Windows, Linux, Mac OS

AWARDS AND HONORS

NSF Graduate Research Fellowship — Beginning Fall 2014

- Wrote a grant that provided funding in the form a National Science Graduate Research Fellowship that pays $32,000 a year for three years with additional tuition assistance paid to the university

University of Arizona President's Award for Excellence — August 2008 – May 2012

- A tuition assistance grant awarded for academic excellence ($8,000 year annually)

Dean's List — (Spring 2009, Spring 2010, Spring 2011)

NREUP Scholar at UT Arlington funded by Mathematical Association of America — Summer 2010

ACTIVITIES AND INVOLVEMENT

Clubs and Organizations

University of Arizona College of Science Ambassador — Fall 2010–Spring 2012

University of Arizona Mathcats — Fall 2008–Spring 2009

Community Service

Blanton Museum, Austin, TX, Volunteer — Fall 2013–Present

University of Arizona Poetry Center, Volunteer — Fall 2010 – Summer 2012