

# Melissa Steele-Ogus

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## EDUCATION

- University of Washington** 2013-2021  
 PhD Biology  
 Dissertation: *Cytoskeletal Innovations in Giardia lamblia*
- University of California, Berkeley**  
 BS Environmental Sciences - Biological Sciences Emphasis, graduated with distinction 2003-2012  
 Thesis: *The Foraging Behavior of Apis mellifera and California Native Bees Relative to Flowering Phenology*  
 Advisor: Dr. Gordon Frankie
- BA Molecular and Cell Biology- Cell/Developmental Biology Emphasis, minor in Latin Studies, graduated with distinction 2003-2012
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## HONORS AND AWARDS

- WRF-Hall Fellowship** 2016
- National Science Foundation Graduate Research Fellowship Program Fellow** 2014-2017
- Achievement Rewards for College Scientists (ARCS) Fellow, Seattle Chapter** 2013-2016
- Dean's List, University of California, Berkeley** Spring 2010-Spring 2012
- Golden State Exam Governor's Scholar** 2002
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## RESEARCH EXPERIENCE

- Dissertation Research** 2013-2021  
**Alex Paredez Lab, Biology**  
**University of Washington**  
*Cytoskeletal Innovations in Giardia lamblia*

- Designed and executed experiments to understand actin's role in *Giardia* host attachment
- Presented research at conferences and meetings
- Measured intracellular concentration of *Giardia* actin
- Refined techniques for purifying protein endogenously from *Giardia* cells
- Identified 46 novel actin interactors in *Giardia*

- Postgraduate Research Technician** May 2012-July 2013  
**Andreas Martin Laboratory, Molecular and Cell Biology**  
**University of California, Berkeley**  
*Elucidation of the Location and Function of the 26S Proteasome Subunit SEM1*

- Designed and executed experiments to identify the structure and position of SEM1 in the 26S proteasome lid
- Assisted in research to identify subcomplex of the 26S proteasome lid
- Presented research to colleagues

**Undergraduate Research Apprentice** **May 2010-May 2011**  
**Neil Tsutsui Laboratory, Environmental Science, Policy, and Management**  
**University of California, Berkeley**

- Extracted DNA from *Formica* spp, performed PCR and genotyping on DNA samples
- Prepared chemical samples for gas chromatography mass spectrometry

**Undergraduate Research Assistant** **March 2008-May 2009**  
**Gordon Frankie Laboratory, Environmental Science, Policy, and Management**  
**University of California, Berkeley**

*Thesis: The Foraging Behavior of Apis mellifera and California Native Bees Relative to Flowering Phenology*

- Designed and executed experiments to understand relationships between California native bees and native/non-native flower life cycle
- Assisted in the *California Native Bee Project*

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## **RESEARCH INTERESTS**

- The cell biology of protozoan parasites
- The role of novel organelles in host-parasite interactions
- Novel organelles in non-model organisms
- The relationship between actin and microtubule structures

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## **TEACHING EXPERIENCE**

**Paredes Lab, University of Washington**

Mentor to Undergraduate Researchers

2014-present

- Mentored undergraduate researchers in independent projects
- Trained students in laboratory techniques, including gene cloning, *Giardia* culture, and deconvolution microscopy

**Robinson Center for Young Scholars, University of Washington**

Co-Instructor

2020

Introduction to Microbiology

- Adapted curriculum for remote learning
- Designed remote laboratory experiments
- Implemented inquiry-based learning
- Lectured and led discussions
- Evaluated students' progress and provided feedback to parents

- Topics included immunology, epidemiology, genetics, metabolism, microbial ecology, food microbiology, and molecular laboratory techniques

### University of Washington

Teaching Assistant

2018-2021

400-level Laboratory Genomics course with Professor Alex Paredez

- Managed students in a laboratory setting
- Prepared lab materials
- Graded assignments
- Wrote and implemented quizzes to evaluate students' understanding of material
- Guided students through deconvolution microscopy
- Topics included PCR and primer design, Gibson cloning, *E. coli* culture, DNA sequencing, western blot, *Giardia* transfection, immunofluorescence microscopy

Teaching Assistant

2020

400-level Advanced Mechanobiology course with Professor Clemens Cabernard

- Led discussion sections
- Facilitated small group discussions of scientific papers
- Graded assignments and prepared answer keys
- Topics included division, cytoskeleton, cell motility, development

Teaching Assistant

300-level Cell biology course with Dr. Brian Buchwitz and Professor Alex Paredez

2021

- Led discussion sections
- Graded assignments and exams
- Facilitated inquiry-based learning

Teaching Assistant

300-level Advanced techniques in molecular and cellular biology with Dr. Linda Martin-Morris and Professor Takato Imaizumi

2018, 2019, 2020

- Managed students in a laboratory setting
- Prepared lab materials
- Wrote and implemented quizzes to evaluate students' understanding of material
- Topics included DNA extraction, PCR and genotyping, site-directed mutagenesis, Yeast 2-Hybrid, plant genetics, *E. coli* transformation and culture

Teaching Assistant

2019

400-level Immunology with Dr. Justine Liepkalns

- Graded quizzes and assignments
- Facilitated inquiry-based learning
- Led discussion sections
- Topics included pathogens, parasites, innate and adaptive immunity

2014 and 2018

Teaching Assistant

400-level Chemical Communication with Professor Jeff Riffell

- Graded assignments
- Led discussion sections
- Topics included mammal and insect olfaction, plant toxicity and communication, chemosensation, chemotaxis, insect chemical communication, olfactory-related diseases

Teaching Assistant

2014

400-level Molecular and Cell Biology of Human Disease with Professor Barbara Wakimoto

- Managed groups of students
- Wrote answer keys and graded assignments
- Provided feedback on student work
- Topics included human diseases and their underlying molecular and cellular mechanisms

**Private Tutor**

**2003-Current**

Private tutoring in the subject areas of Latin, Chemistry, and Biology

**Science Educator, East Bay Academy for Young Scientists**

**2007**

Assisted in classroom teaching basic scientific concepts and the scientific method to students in grades one through five

- Topics included geology, chemistry, physics

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## **POSTERS AND PRESENTATIONS**

Steele-Ogus M, and A Paredes. *The role of actin and a novel interactor in Giardia Lamblia attachment*. Cell Bio Virtual. 2020.

Steele-Ogus M, and A Paredes. *An Evolutionarily Unique Actin and its Role in Maintaining Infection in Giardia Lamblia*. University of Washington Mitosis Meeting. 2016.

Steele-Ogus M, and A Paredes. *An Evolutionarily Unique Actin and its Role in Maintaining Infection in Giardia Lamblia*. Virtual BEACON Congress. 2020.

Steele-Ogus M, Johnson R, MacCoss, M, and A Paredes. *Evolutionarily Divergent Actin Interactors in the Parasite Giardia Lamblia*. Virtual BEACON Congress. 2020.

Steele-Ogus M, Johnson R, MacCoss, M, and A Paredes. *Missing in Acti(o)n: the Search for Actin-Binding Proteins in Giardia Lamblia*. Plant and Microbial Cytoskeleton Gordon Conference. 2016.

Steele-Ogus M, Johnson R, MacCoss, M, and A Paredes. *Missing in Acti(o)n: the Search for Actin-Binding Proteins in Giardia Lamblia*. University of Washington Mitosis Meeting. 2016.

*Where No Protist Has Gone Before: The Search for Actin-Binding Proteins in Giardia*. Steele-

Ogus M, Johnson R, MacCoss, M, and A Paredez. University of Washington Biology Graduate Student Symposium. 2016.

Steele-Ogus M, Johnson R, MacCoss, M, and A Paredez. *Exceedingly Evolutionarily Extraordinary Eukaryote: the Actin Cytoskeleton of Giardia*. University of Washington Biology Graduate Student Symposium. 2015.

Steele-Ogus M, and G Frankie. *The Foraging Behavior of Apis mellifera and California Native Bees Relative to Flowering Phenology*. Environmental Sciences Symposium. University of California, Berkeley. 2009.

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## **PUBLICATIONS**

Steele-Ogus MC, Obenaus AM, Sniadecki NJ, and A Paredez. *Disc and Actin-Associated Protein 1 Influence Attachment in the Intestinal Parasite Giardia lamblia*. (in preparation)

Steele-Ogus MC, Johnson R, MacCoss M, and AR Paredez. *Identification of Actin Filament Interactors in Giardia lamblia*. Microbiology Spectrum. 2021 Jul 21;e0055821. doi: 10.1128/Spectrum.00558-21

W Hardin, Alas G, Taparia N, Thomas E, Steele-Ogus MC, Hvorecny K, Halpern A, Tumova P, Kollman J, Vaughan J, N Sniadecki, AR Paredez. *Giardia's lamellipodia-like ventrolateral flange supports attachment and rapid cytokinesis* (in preparation)

Krtková J, Xu J, Lalle M, Steele-Ogus MC, Alas G, Sept M, and AR Paredez. *14-3-3 Regulates Actin Filament Formation in the Deep-Branching Eukaryote Giardia lamblia*. mSphere. 2017 Sep-Oct; 2(5): e00248-17. doi: 10.1128/mSphere.00248-17

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## **LEADERSHIP AND ACADEMIC SERVICE**

### **UW Student Technology Fee Grants to obtain Dept of Biology Equipment for student researchers**

Graduate Student Contact

Successfully funded

\$108, 863 Equipment Grant for Benchtop Scanning Electron Microscope **2021**

\$30,632 Equipment Grant for Accessible Digital Graphics Tools **2020**

### **Graduate-led Action for Diversity and Equity (GLADE)**

Founding member **2016-2018**

**Biology department diversity committee** **2014-2015**

Graduate student member

**Graduate and Professional Student Senate****2013-2014**

Biology department senate representative

Member of subcommittee for diversity and equity

**SCIENCE COMMUNICATION AND OUTREACH****Harborside Press****2020-Present**

Contributing author for the tumor-specific online news resource, summarizing latest oncology news and key clinical trial findings from medical literature.

**Local and National K-12 Outreach****2014-Present**

Offered remote and in-person laboratory tours to elementary, middle, and high school students to promote science literacy.

**UW Biology SciPos Blog****2013-2014**

Contributing author for the University of Washington Biology Department's blog.

**Natural History Blogger****2013-2015**

Chronicling my experiences with wildlife, particularly insects.

**Entomology Curator at Pook's Hill Ecolodge****Belize 2013**

Collected and identified local fauna for public education.

**Volunteer at the Lawrence Hall of Science****Berkeley 2007**

Interacted with museum guests to facilitate learning.

**SKILLS**

- Cell culture and transfection of BSL2 organisms
- LC-MSMS sample preparation
- Live cell imaging
- Sample preparation for immunofluorescence microscopy
- CRISPR interference design and execution
- Morpholino knockdowns
- *E. coli* culture
- Gibson reactions and traditional gene cloning
- Deconvolution microscopy
- Immunoprecipitation and affinity chromatography
- SDS-PAGE, Western blotting (immunoblotting)
- Proficiency in PowerPoint, MS Word, FIJI/ImageJ, SoftWorx, and GraphPad Prism
- Fast Phase Liquid Chromatography
- *S. cerevisiae* transfection and cell culture
- Gas Chromatography-Mass Spectrometry sample preparation
- DNA extraction
- PCR
- Agarose gel electrophoresis
- DNA sequencing
- Animal husbandry, including maintenance

- and monitoring of experimental colonies
- Sterile technique
- Record keeping

- Fieldwork, including field site logistical planning
- Bee trapping and

- identification
- Flower stage assessment