

Erik Ames Burlingame

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EDUCATION

PHD IN BIOMEDICAL ENGINEERING | OREGON HEALTH AND SCIENCE UNIVERSITY | PORTLAND, OR
Expected June 2022 • GPA: 4.00/4.00

MS IN BIOLOGY | FOCI ON BIOINFORMATICS AND GENOMICS | UNIVERSITY OF OREGON | EUGENE, OR
Graduated September 2017 • GPA: 4.05/4.00

BS IN BIOCHEMISTRY | UNIVERSITY OF OREGON | EUGENE, OR
Graduated June 2016 • Magna Cum Laude • Departmental Honors • Top Graduate in Major • Major GPA: 3.94/4.00

RESEARCH PROJECTS

MACHINE-DRIVEN APPROACHES FOR HISTOPATHOLOGICAL IMAGE ANALYSIS | CHANG GROUP
January 2017 - Present | Oregon Health and Science University | Portland, OR
Supervisor: Dr. Young Hwan Chang

- Implementing deep learning image analysis technology to stratify metastasis risk in patients with early melanoma.
- Implementing generative adversarial network framework to accurately predict biomarker distribution in medical images.
- Streamlining existing workflow to allow parallel processing of images on a distributed compute cluster.

HIGH-THROUGHPUT SCREENING OF PROTEIN-PEPTIDE BINDING SELECTIVITY | HARMS GROUP
September 2016 - December 2016 | University of Oregon | Eugene, OR

- Developed a pipeline to quantitatively determine protein-peptide binding selectivity from phage display experiments.
- Parsed and analyzed sequencing data to build peptide ligand multiple sequence alignments and count matrices.
- Determined biochemical, biophysical, and information theoretical peptide properties that correlate with selectivity.

ASSESSING MOLECULAR DRIVERS OF PRE-SYNAPTIC TERMINAL ASSEMBLY | WASHBOURNE GROUP
December 2013 – June 2016 | University of Oregon | Eugene, OR
Supervisor: Dr. Philip Washbourne

- Used integrative zebrafish model to assess putative role of calcium-dependent serine kinase (CASK) in synaptogenesis.
- Assayed behavioral deficits that result from injection of anti-CASK morpholinos and misexpression of CASK constructs.
- Immunohistochemically quantified presynaptic proteins correlating with behavioral phenotype.

PUBLICATIONS

Burlingame E.A., Margolin A.A., Gray J.W., and Chang Y.H., "SHIFT: Speedy Histopathological-to-ImmunoFluorescent Translation of whole slide images using conditional generative adversarial networks," in *Proc. SPIE* **10581**, (2018).

RESEARCH PRESENTATIONS

Burlingame E.A., Margolin A.A., Gray J.W., and Chang Y.H. (February 2018) *SHIFT: Speedy Histopathological-to-ImmunoFluorescent Translation of whole slide images using conditional generative adversarial networks*. Oral presentation at SPIE Medical Imaging 2018, Houston, TX.

Burlingame E.A., Thibault G., Hornick N., Leachman S., Margolin A.A., Gray J.W., and Chang Y.H. (May 2017) *Automated segmentation and machine-driven classification in the histopathological image analysis of melanoma*. Poster presented at the UO Graduate Student Research Forum, University of Oregon, Eugene, OR.

Burlingame E.A.*, Sivagnanam S.*, Su W.*, and Wheeler L. (November 2016) *Sequencing analysis of phage display peptide screen for protein binding selectivity*. Poster presented at the Genomics in Action Conference, University of Oregon, Eugene, OR. (* denotes equal contributors).

Burlingame E. A. and Washbourne P.E. (May 2016) *Pre-synaptic terminal assembly modulated by a molecular hitch*. Poster presented at the Undergraduate Research Symposium, University of Oregon, Eugene, OR.

Burlingame E.A. and Washbourne P.E. (May/August 2015) *Investigating the role of CASK in synapse formation*. Poster/oral presentations delivered at McNair and NICHD-R25 symposia, University of Oregon, Eugene, OR.

SKILLS & FAMILIARITIES

SCRIPTING

UNIX • Python • R • MATLAB

SOFTWARE

cryoSPARC • Relion • PyMol molecular visualization system • HPC environments e.g. Exacloud and its slurm workload manager • Keras deep learning library • PyTorch deep learning library • CV2 computer vision library • Cytomine multi-gigapixel image platform • Copasi biochemical modeling package • BLAST sequence aligner • GMAP-GSNAP genomic alignment package • limma-voom differential expression package • PEP-FOLD3 peptide structural modeler • SQL databases • Trinity transcriptome assembler • Velvet genome assembler • Autodesk Fusion 360 CAD tool • Microsoft Office • L^AT_EX • Adobe Suite

HARDWARE

FEI Tecnai with iCorr • LI-COR Odyssey Fc Imaging System • Nikon Eclipse TE2000-U Confocal Microscope

WET LAB

Negative stain sample preparation • PCR • DNA preparation • RNA-seq library preparation • RNA synthesis • Pipetting • Molecular cloning • Protein purification • Western blot • SDS-PAGE • Enzymatic assays • Chromatography • Immunohistochemistry • Micro-injection • Fish husbandry

RELEVANT COURSEWORK

Biochemistry + Lab • Organic Chemistry + Lab • Physical Biochemistry • Statistical Mechanics • Thermodynamics • Bioinformatics • Molecular Genetics • Genomic Analysis • Neurophysiology • Neurobiology • Systems Neuroscience • General Physics • Computer Science • Calculus • Statistics • Discrete Math • Biomedical Ethics

WORKSHOPS ATTENDED

Workshop on Deep Learning for Cryo-EM at the National Resource for Automated Molecular Microscopy, Simons Electron Microscopy Center, New York Structural Biology Center, New York City, NY. April 10th, 2018.

TEACHING EXPERIENCE

GRADUATE TEACHING FELLOW | DEPARTMENT OF BIOLOGY

University of Oregon | Eugene, OR | September 2016 – December 2016

- Taught lab portion of introductory human anatomy and physiology course for non-biology majors.
- Evaluated student lab notebooks with emphasis on skills that are transferable to other biology courses.

LECTURER | SCIENCE LITERACY PROGRAM

University of Oregon | Eugene, OR | January 2015 – March 2015

- Facilitated discussions of scientific topics in a 200-seat genetics class for non-science majors.
- Prepared curriculum and delivered two eighty-minute lectures on mutation and genetic disease.

TEACHING LABORATORY ASSISTANT AND TUTOR | DEPARTMENT OF BIOLOGY

University of Oregon | Eugene, OR | September 2014 - December 2014

- Provided teaching support for biochemistry teaching lab, including demonstrations of technique and instrumentation.
- Assisted students during scheduled tutoring hours outside of lab.

RELEVANT WORK EXPERIENCE

ASSISTANT FISH TECHNICIAN | INSTITUTE OF ECOLOGY AND EVOLUTION

FEDERAL WORK-STUDY PROGRAM

University of Oregon | Eugene, OR | Sept 2013 – June 2014

- Maintained research stock of three-spined stickleback used in studies of evolutionary and functional genomics.
- Followed standard fish husbandry protocols in compliance with the IACUC.

LABORATORY ASSISTANT | DEPARTMENT OF BIOLOGY

Portland Community College | Portland, OR | Aug 2012 – June 2013

- Maintained general science laboratories, including instrument calibration, maintenance of chemical stocks, and data entry.
- Worked with instructional support technicians to improve organization of teaching materials.

OTHER WORK EXPERIENCE

ADMINISTRATIVE ASSISTANT | INSTITUTE OF ECOLOGY AND EVOLUTION

FEDERAL WORK-STUDY PROGRAM

University of Oregon | Eugene, OR | June 2014 – June 2016

- Assist with general administrative tasks, including invoice processing, file organization, and delivery handling.

ACADEMIC AWARDS

- 2017 Achievement Rewards for College Scientists (ARCS) Foundation Scholarship | Oregon Health and Science University
- 2016 Biochemistry Achievement Award (Top Graduate in Major) | University of Oregon
- 2015 Undergraduate Research Fellowship | Sole Awardee of Full Tuition Waiver | University of Oregon
- 2016 Mary E. Russell Scholarship | University of Oregon
- 2016 Biology Poster Award | Undergraduate Research Symposium | University of Oregon
- 2016 General University Scholarship | University of Oregon
- 2016 Henry V. Howe Scholarship | University of Oregon
- 2016 Paul and Helen Weiser Memorial Scholarship | University of Oregon
- 2015 Mary Alden Scholarship | University of Oregon
- 2015 Henry V. Howe Scholarship | University of Oregon
- 2015 Summer Program for Undergraduate Research Award | University of Oregon
- 2014 Science Literacy Scholarship | University of Oregon
- 2014 Ronald E. McNair Scholarship | University of Oregon
- 2013 Swayne Family Scholarship | University of Oregon
- 2012 Phi Theta Kappa Honors Institute Scholarship | Portland Community College

RESEARCH GRANTS

- 2017 Cancer Early Detection and Research (CEDAR) Seed Grant (\$37K) | Oregon Health and Science University
- 2015 UROP Mini-Grant (\$1K) | University of Oregon