Kyobi J. Skutt-Kakaria

CONTACT INFORMATION
Phone: (360) 584-2434 (cell)
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APPOINTMENTS

Lecture and Course Associate, University of Washington, Seattle, WA — Aug. 2022 - Present
NEUSCI 302 & 301, Neuroscience Major

Instructor, Caltech, Pasadena, CA — Jan. 2022 - June 2022
Principles of Biology, Division of Biology and Biological Engineering

Postdoctoral Fellow, Caltech, Pasadena, CA — Feb. 2019 - July 2022
Dr. Michael Dickinson, Division of Biology and Biological Engineering

Postdoctoral Fellow, Harvard, Cambridge, MA — June - Dec. 2018
Dr. Benjamin de Bivort, Dept. of Molecular and Cellular Biology

EDUCATION

Harvard University, Cambridge, MA — 2012 - 2018
Ph.D. in Neuroscience
Dissertation: Establishment and Control of Behavioral Bias in *Drosophila melanogaster*
Advisor: Dr. Ben de Bivort

The Evergreen State College, Olympia, WA — 2008 - 2012
B.S. in Molecular Biology/Microbiology

TEACHING EXPERIENCE

Full-time Lecturer and Course Associate — Fall 2022 - Present
Department of Psychology, The University of Washington
- Acting as course associate for NEUSCI 302 and NEUSCI 301 with Prof. Martha Bosma
- Managing a team of 4 TIs, 1 technician and 2 peer-facilitators to run and organize laboratory activities
- Reinvigorating courses by creating a more accessible and inclusive environment, updating labs, and continuing hands-on laboratory activities and discussions

Co-Instructor/Postdoctoral Teaching Fellow for Bi1: Principles of Biology — Spring 2022
Division of Biology and Biological Engineering, Caltech
- Worked in close collaboration with Prof. Bruce Hay to craft course content and format for a 200-student non-majors introductory biology class
- Conceptualized and delivered lectures on diverse biological concepts with a focus on quantitative reasoning and critical thinking instead of memorization
- Organized a group of guest lectures to highlight modern research approaches to answering biological questions
- Developed problem sets and in-class workshop activities to foster active learning
- Managed a team of 16 teaching assistants

Head Laboratory Teaching Fellow for Neurobiology of Behavior (MCB80) — Fall 2017
Profs. Jeff Lichtman and Venki Murthy
Dept. of Molecular and Cellular Biology (MCB), Harvard
- Conceptualized and designed in-class worksheets to implement active learning
- Worked in collaboration to organize and generate in-class demonstrations to highlight neuroscience concepts
- Designed problem sets and workshop activities for use in section
- Created a one day "Brain Activity Fair" to expose students to a broad range of organisms and research questions
- Co-managed a team of 8 teaching fellows

Co-Instructor for Neurobiology of Behavior (BIOSP13545) Summer 2017
Pre-College Summer Program, Harvard
- Designed syllabus for neuroethology summer course for high school students
- Generated curriculum for two-weeks of three-hour instructional periods peer day
- Created in class activities and out of class homework to reinforce lessons and support student learning
- Designed and implemented in class electrophysiology laboratory studying the cerci system of cockroaches
- Implemented an in-class concept video project for students to explain complex concepts using artistic simplification

Curriculum Fellow for Neurobiology of Behavior (MCB80) Spring 2017
Bok Center for Teaching and Learning and MCB Dept., Harvard
- Collaborated with the Bok Center for Teaching and Learning to design a flipped classroom implementation
- Designed and created test activities and materials for students to do during class
- Worked with a group of undergraduate students to test these activities

Graduate Teaching Fellow for Neurobiology of Behavior (MCB80) Fall 2016
Profs. Jeff Lichtman and Josh Sanes
Dept. of Molecular and Cellular Biology, Harvard
- Taught a 16-student section in support of course material
- Designed my own in class activities and problems for students to work with during section
- Implemented active learning techniques like peer-to-peer instruction, think-pair-share, group presentation and group work
- Graded student short answer, mathematical and written assignments

Graduate Teaching Fellow for Cellular Physiology of Neurons (MCB115) Fall 2014
Prof. Venki Murthy
Dept. of Molecular and Cellular Biology, Harvard
- Taught a 16-student section in support of course material
- Reviewed and focused on difficult concepts in cellular physiology of neurons including detailed mathematical descriptions of currents and voltages during dynamic events in the neuron (i.e., action potentials, neurotransmitter release etc.)

Graduate Teaching Fellow for Molecular Biology (MCB52) Fall 2013
Prof. Briana Burton
Dept. of Molecular and Cellular Biology, Harvard
- Taught a 16-student section in support of course material
- Graded student short answer, mathematical and written assignments
- Ran labs focused on DNA analysis and molecular cloning

Teaching Certificate, Bok Center for Teaching and Learning, Harvard 2018
- Problems and P-Sets: Creating and Teaching Questions in STEM
- Fall and Winter Teaching Conferences, Harvard Bok Center

Research Experience

Postdoctoral Fellow, Caltech Pasadena, California
Division of Biology and Biological Engineering 2019-2022
Advisor: Dr. Michael Dickinson, Ph.D.
- Designed and built novel behavioral arena to test effects of rotational motion on fly behavior
- Conceptualized and built an optical system to measure bulk calcium activity in neurons during un-tethered walking
- Built a fly-on-a-ball set-up to adapt to the 2-photon microscope
- Segmented descending neurons, interneurons, and motor neurons in the female adult nerve cord (FANC) electron microscopy database
- Developed analysis and visualization pipelines for all projects using Python packages including NumPy, SciPy, Pandas and Matplotlib

Graduate Student and Postdoctoral Fellow, Harvard — Cambridge, Massachusetts
Dept. of Molecular and Cellular Biology — 2012-2018
Advisor: Dr. Benjamin de Bivort, Ph.D.

- Designed experiments to test behavioral biases in different light conditions
- Performed neuro anatomical analysis using immunohistochemistry
- Used 2-photon microscopy to image calcium activity in the brain of behaving fruit flies *in vivo*
- Developed a computational model of fruit fly central complex circuit brain region
- Wrote extensive modeling and analysis pipeline codes in MATLAB
- Generated graphical representations of complex data sets for visualization purposes
- Wrote multiple manuscripts and NIH F31 grant proposals
- Continued Ph.D. work as a Postdoc by designing and building a fly-on-a-ball 2-photon imaging system and used it to capturing calcium activity in fly's central complex neurons

Research Technician, Fred Hutchinson Cancer Research Center — Seattle, Washington
Bioinformatics and Human Biology — 2011-2012
Advisor: Dr. Patrick Paddison, Ph.D.

- Alignment, mapping, and analysis of Illumina genomic sequencing data for RNA-Seq, ChIP-Seq, shRNA-Seq using bash scripting
- Generation and design of analysis and visualization pipelines in R

Research Associate, The Evergreen State College — Olympia, Washington
Bacteriophage and Cell biology — 2011
Advisor: Dr. Benjamin Simon, Ph.D.

- Isolation of bacteriophages from environmental samples
- Cell culture of Salmonid cell line and bacterial pathogen

Research Associate,The Evergreen State College — Olympia, Washington
Bacteriophage biology — 2010-2011
Advisor: Drs. Elizabeth Kutter and Andrew Brabban, Ph.D.

- Kinetic analysis of bacteriophage infections
- Gene annotations for undescribed bacteriophage genomes using BLAST

PUBLICATIONS

B. de Bivort, S. Buchanan, **K. Skutt-Kakaria**, E. Gajda, C. O'Leary, P. Reimers, J. Akhund-Zade, R. Senft, R. Maloney, S. Ho, Z. Werkhoven, M. A-Y Smith; Precise quantification of behavioral individuality from 80 million decisions across 183,000 flies; *bioRxiv*, (2022); DOI: https://doi.org/10.1101/2021.12.15.472856

Z. Werkhoven, A. Bravin, **K. Skutt-Kakaria**, P. Reimers, L.F. Pallares, J. Ayroles, B.L. de Bivort; The structure of behavioral variation within a genotype; *eLife*, (2021); DOI: 10.7554/eLife.64988

K. Skutt-Kakaria, P. Reimers, B.L. de Bivort; A neural circuit basis for context-modulation of individual locomotor behavior; *bioRxiv*, (2019); DOI: https://doi.org/10.1101/797126

K. Skutt-Kakaria, B. de Bivort; Ring Attractor Dynamics Emerge from a Spiking Model of the Entire Protocerebral Bridge; *Frontiers in Behavioral Neuroscience*, (2017), PMID: 28261066

J.F. Ayroles, S.M. Buchanan, C. O'Leary, **K. Skutt-Kakaria**, J.K. Grenier, A.G. Clark, D.L. Hartl, B.L. de Bivort; Behavioral idiosyncrasy reveals genetic control of phenotypic variability; *Proceedings of the National Academy of Sciences*, (2015); PMID: 25953335

Y. Ding, C.G. Hubert, J. Herman, P. Corrin, C.M. Toledo, **K. Skutt-Kakaria**, J. Vazquez, R. Basom, B. Zhang, J.K Risler, S.M. Pollard, D.H. Nam, J.J. Delrow, J. Zhu, J. Lee, J. DeLuca, J.M. Olson, P.J. Paddison; Cancer-Specific requirement for BUB1B/BUBR1 in human brain tumor isolates and genetically transformed cells, *Cancer Discovery*, (2013), PMID: 23154965

C.G. Hubert, R.K. Bradley, Y. Ding, C.M. Toledo, J. Herman, **K. Skutt-Kakaria**, E.J. Girard, J. Davison, J. Berndt, P. Corrin, J. Hardcastle, R. Basom, J.J. Delrow, T. Webb, S.M. Pollard, J. Lee, J.M. Olson, P.J. Paddison; Genome-wide RNAi screens in human brain tumor isolates reveal a novel viability requirement for PHF5A, *Genes Development*, (2013), PMID: 23651857

X. Chen, **K. Skutt-Kakaria**, J. Davison, Y.L. Ou, E. Choi, P. Malik, K. Loeb, B. Wood, G. Georges, B. Torok-Storb, and P.J. Paddison; G9a/GLP-dependent histone H3K9me2 patterning during human hematopoietic stem cell lineage commitment, *Genes Development* 2012, (2011), PMID: 21899740

E.M. Kutter, **K. Skutt-Kakaria**, B. Blasdel, A. El-Shibiny, A. Castano, D. Bryan, A.M. Kropinski, A. Villegas, H.W. Ackermann, A.L. Toribio, D. Pickard, H. Anany, T. Callaway, A.D. Brabban; Characterization of a ViI-like Phage Specific to Escherichia coli O157:H7, *Virology Journal* 2011, (2011), PMID: 21899740

Invited Talks

K. Skutt-Kakaria, P. Reimers, B. de Bivort, A circuit for context-dependent individual behavioral tendencies, *Structure and Function of the Insect Central Complex*, Janelia Research Campus, Ashburn, VA, October, (2018)
K. Skutt-Kakaria, P. Reimers, B. de Bivort, A circuit for context-dependent individual behavioral tendencies, *Junior Scientist Workshop on Neural Circuits and Behavior*, Janelia Research Campus, Ashburn, VA, October, (2017)
K. Skutt-Kakaria, P. Reimers, B. de Bivort, A circuit for context-dependent individual behavioral tendencies, *Neurotuscany*, Montecastelli Pisano, Tuscany, Italy, June, (2017)
K. Skutt-Kakaria, P. Reimers, B. de Bivort, Individual locomotor biases are modulated by light, *Neurotuscany*, Montecastelli Pisano, Tuscany, Italy, June, (2016)

Awards

2013-2018: **Graduate Research Fellow**, National Science Foundation
2010-2011: **S-STEM Scholar**, National Science Foundation, The Evergreen State College
2011: **Evergreen Foundation Grant Recipient**, The Evergreen State College

Professional Development

2022: **Member**, Society for College Science Teaching
2017: **Attendee**, Junior Scientist Workshop on Neural Circuits and Behavior, Janelia Research Campus

Science Outreach

2022: **Visiting Scientists Instructor**, Pasadena Unified School District
– Teach science lessons to 5th graders weekly for 3 hrs
2021: **Ready21 Instructor**, Stars
– Teach hands-on science lessons over the summer to 1-5th graders weekly
2018: **Public seminar series speaker**, Science In The News
– Harvard graduate student science communication group
– Talk: *Altered State of Mind: How Psychedelics Modify the Brain, Behavior, and Perception*

References Available to Contact

Dr. Martha Bosma (e-mail: martibee@uw.edu; phone: (206) 616-9031)
Professor of Biology
Department of Biology, University of Washington

Dr. Bing Wen Brunton (e-mail: bbrunton@uw.edu; phone: (206) 221-9330)
Associate Professor of Biology
Department of Biology, University of Washington

Dr. Michael Dickinson (e-mail: flyman@caltech.edu; phone: (626) 395-3906)
Esther M. and Abe M. Zarem Professor of Bioengineering and Aeronautics
Division of Biology and Biological Engineering, California Institute of Technology

Dr. Ben de Bivort (e-mail: debivort@oeb.harvard.edu; phone: (617) 230-3769)
Professor of Organismic and Evolutionary Biology
Dept. of Organismic and Evolutionary Biology and the Center for Brain Science, Harvard University

Dr. Jeff Lichtman (e-mail: jeff@mcb.harvard.edu; phone: (617) 496-8943)
Jeremy R. Knowles Professor of Molecular and Cellular Biology
Department of Molecular and Cellular Biology and Center for Brain Science, Harvard University