CURRICULUM VITAE

# KRISTA EVA PERKS

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## Education/Training

**Visiting Assistant Professor, Wesleyan University**, Middletown, CT 2021-2023
Biology Department

**Postdoctoral Research Scientist, Columbia University**, New York, NY 2017-2020
Laboratory of Dr. Nathaniel Sawtell, Department of Neuroscience

**PhD, Neurosciences, University of California San Diego**, San Diego, CA 2009-2016
Thesis Committee: Dr. Timothy Gentner (primary), Dr. Massimo Scanziani, Dr. Jeffry Isaacson, Dr. John Reynolds, Dr. Takaki Komiyama
(Masters Qualification 2011)
GPA 4.0/4.0
GRE 630V/770M (5-Writing)

**MA, Neuroscience and Behavior, Wesleyan University**, Middletown, CT 2006-2007
GPA 4.0/4.0
Thesis: "Adaptive sensory filtering in the cerebellar-like mechanosensory nucleus of the hindbrain in *Raja erinacea*" (Committee: David Bodznick (primary), John Kirn, Gloster Aaron)

**BA, Neuroscience and Behavior, Wesleyan University**, Middletown, CT 2002-2006
Class Rank 2/713
GPA 4.0/4.0

### Research Advisors

- Dr. Nathaniel Sawtell, Postdoctoral Research Scientist, Columbia University 2017 - 2020
- Dr. Timothy Gentner, PhD Thesis Student, UCSD 2010 - 2016
- Dr. William Kristan, Graduate Rotation Student, UCSD 4/2010-6/2011
- Dr. Sascha DuLac, Graduate Rotation Student, Salk Institute 12/2009-2/2010
- Dr. David Bodznick, Undergrad Research and Masters Student, Wesleyan University 2005-2007

## Teaching

### Wesleyan University, Middletown, CT

Visiting Assistant Professor 2021-2023

- Animal Behavior (Spring 2021)
- Motor Systems (Spring 2021)
- Neurophysiology Laboratory (Projected Fall 2021)

University of California San Diego, CA

Associate-In, Biology Dept. August-September, 2015
Summer Sessions: *BILD2 Multicellular Life*
~100 students enrolled
Appointed through the Summer Graduate Teaching Fellow program
Support and training through the Center for Teaching and Learning, UCSD

Research Mentor June-August, 2015
Primary research mentor for a senior college student hosted in the Gentner Laboratory as part of the STARS program.

Guest Lecturer, Neurosciences Graduate Program: Neuroanatomy. April, 2014
*The Cerebellum: a comparative perspective*

Teaching Assistant: 2010-2013
- Neurosciences Graduate Program: Neurophysiology "Bootcamp" (4 years: 2010-1013)
- Psychology: Sensation and Perception (Spring 2012)
- Neurosciences Graduate Program: Cellular and Molecular Neuroscience (Fall 2010)
- Neurosciences Graduate Program: Neuroanatomy (Spring 2011)

NSF GK-12 STEM Teaching Fellow with ScienceBridge, UCSD 2012-2013
- Developed and published a G10-12 Lesson Plan based on my research in the Gentner Lab.
- Taught several Biology classes one day a week throughout the school year in the classroom of Jeff Kepper at Helix High School (La Mesa, CA)
- Guest Lecturer at High Tech High North County (San Marcos, CA)

High Tech High Internship Program May-June 2013
Research Mentor hosting a Junior student: Sophie Marie Prime. For more information see Sophie's project site: http://sophieprimeinternship2013.weebly.com/index.html
Final Presentation of Learning to her Advisors: http://prezi.com/lscgzzvsd7g_/prime-sophie-internship-tpol-thursday-june-13-13-gentner-lab-2013/

Wesleyan University, Middletown, CT

Teaching Assistant: 2005-2006
- Introduction to Neuroscience (Fall 2005, Fall 2006)
- Neurophysiology Laboratory (Spring 2006)

## Academic and Professional Honors/Awards

Postdoc:

- Junior Fellow, Simons Society of Fellows, NYC 2018-present
  A fellowship that provides full salary and benefits to post-doctoral researchers in the NYC area.
  Sponsor: Nathaniel Sawtell.

Graduate:

- Recipient of the Neurosciences Graduate Teaching Award 2015
  An award to recognize excellence in teaching among the graduate students of the Neurosciences Program at UCSD.

- NIH Predoctoral Fellowship with the Institute for Neural Computation 2014-2015
  Co-Sponsors: Dr. Timothy Gentner (primary) and Dr. William Kristan (secondary)
- Recipient of the "Innovative Research Grant" from the Kavli Institute for Brain and Mind 2013-2014
  Project Title: "Synaptic mechanisms for natural signal integration"
  Co-Investigators: Dr. Timothy Gentner (primary) and Dr. Massimo Scanziani (secondary)
- NIH Predoctoral Fellowship with the Institute for Neural Computation 2013-2014
  Co-Sponsors: Dr. Timothy Gentner (primary) and Dr. William Kristan (secondary)
- National Science Foundation (NSF) STEM GK-12 Fellowship 2012-2013
- NIH T32 Neuroscience Graduate Training Grant 2009-2011

Undergraduate:

- Salutatorian, Wesleyan University, Middletown, CT 2006
- George H. Acheson and Grass Foundation Prize in Neuroscience, Wesleyan University. 2006
  Awarded to an outstanding undergraduate in the Neuroscience and Behavior Program who demonstrates excellence in the program and who also shows promise for future contributions in the field of neuroscience.
- Graham Prize in Neuroscience, Wesleyan University. 2006
  Awarded to a member of the graduating class for excellence in natural sciences.
- Howard Hughes Institute Summer Fellow, Wesleyan University. June-Aug 2005
  Awarded to encourage participation and interest in the life sciences by undergraduates. Supported an investigation of adaptive filtering in the medial nucleus of the skate hindbrain, which was carried out at Marine Biological Laboratory, Woods Hole, MA.
- Phi Beta Kappa, CT Gamma chapter. Spring 2005

## Presentations and Publications

### Publications:

Thielman B., **Perks K.**, Gentner T. (2020) *Spike Train Coactivity Encodes Learned Natural Stimulus Invariances in Songbird Auditory Cortex*. Journal of Neuroscience; Manuscript accepted for publication 31 Oct. 2020.

**Perks K.**, Krotinger A., and Bodznick D. (2020) *A cerebellum-like circuit in the lateral line system of fish cancels mechanosensory input associated with its own movements.* Journal of Experimental Biology, 223(Pt 4).

**Perks K.**, Sawtell N.B. (2019) *Influences of Motor Systems on Electrosensory Processing*. In: Carlson B., Sisneros J., Popper A., Fay R. (eds) Electroreception: Fundamental Insights from Comparative Approaches. Springer Handbook of Auditory Research, vol 70. Springer, Cham.

Montgomery J. and **Perks K**. (2019) *Understanding the cerebellum in vertebrate neuroethology: From sensing in sharks and electric fish to motor sequences in movement and birdsong.* Behavioral Neuroscience, 133(3), 267-281.

**Perks K**. (2016). Through the looking glass: population dynamics through membrane potentials. PhD Thesis. University of California, San Diego. 107pp.

**Perks K**. and Gentner T. (2015) *Subthreshold membrane responses underlying sparse spiking to natural vocal signals in auditory cortex*. European Journal of Neuroscience, 41(5), 725-33.

**Perks K**. (2007). Adaptive sensory filtering in the cerebellum-like mechanosensory nucleus of the hindbrain in Raja Erinacea. Masters Thesis, Wesleyan University, Connecticut. 66p.

*In Progress*:

**Perks K**. and Sawtell N. "*Neural mechanisms for reading out a latency code for stimulus intensity*." Manuscript in progress for submission to Nature.

**Perks K**. and Gentner T. "*Natural signals drive fast modulation of stimulus-specific functional networks in cortex*." Manuscript in progress for submission to Journal of Neuroscience.

## Professional Meetings Attended (* indicates poster presentation):

- International Congress for Neuroethology (ICN) 2018*
- Electric Fish Satellite Meeting to ICN 2018*
- Society for Neuroscience (SfN) 2009, 2010*, 2011*, 2012, 2013*
- Mechanisms of Communication 3 2013*
- Advances and Perspectives in Auditory Neuroscience (APAN) 2010

## Posters/Abstracts:

**Perks, K.** and Sawtell, N. (2018) "Mechanisms for gating in and reading out a latency code in the electrosensory system of mormyrid fish" *International Congress for Neuroethology and Electric Fish Satellite, Poster Session* (2018).

**K. Perks**, E. Caporello, T. Gentner, "Mechanisms of signal and noise integration in auditory cortical neurons." *SfN Poster Session* 454 (2013).

**K. Perks**, E. Caporello, T. Gentner, "Mechanisms of signal and noise integration in auditory cortical neurons." *Mechanisms of Communication 3, Poster Session* (2013).

**K. Perks**, T. Gentner, "Balance of inhibitory and excitatory postsynaptic currents evoked by conspecific song in the auditory nucleus NCM of the European Starling." *SfN Poster Session* 692.25 (2011).

**K. Perks**, L.E. McElvain, S. DuLac, "Development of frequency-independent synaptic transmission at central vestibular nerve synapses." *SfN Poster Session* 677.6 (2010).

## Talks:

*Through the looking glass: population dynamics through membrane potentials*. September 2016
Thesis Defense Seminar. La Jolla, CA.

*Spatial organization of functional subnetworks in cortical auditory processing*. June 2015
Presented at UCSD Neurosciences "Neuro-Dinner Seminar Series". La Jolla, CA.

*Mechanisms of diverse, state-dependent input operations in single neurons underlying object-recognition*. March 2015
Presented at NYU Medical Center. New York, New York.

*Synaptic pooling strategies for stimulus selectivity*. Nov 2014
Presented at UC San Diego Neurosciences Graduate Program Research Rounds. La Jolla, CA.

*Mechanisms of auditory signal processing in natural and noisy environments*. May 2014
Presented at Ninth Annual KIBM Symposium on Innovative Research. La Jolla, CA.

*Synaptic mechanisms for how natural acoustic variation shapes cortical auditory encoding*. March 2014
Presented at UC San Diego Institute for Neural Computation Workshop. La Jolla, CA.

*Synaptic response states in the auditory cortex driven by natural vocalizations*. January 2014
Presented at UC San Diego Neurosciences Graduate Program Research Rounds. La Jolla, CA.

*Mechanisms of response integration in multi-signal contexts*. May 2013
Presented at UC San Diego Cognitive Neural Systems Group Seminar, La Jolla, CA.

*Mechansisms of response integration in noisy environments*. March 2013
Presented at UC San Diego Neurosciences Graduate Program Research Rounds. La Jolla, CA.

*Object Recognition: Reconstructing the sensory soundscape*. May 2012
Presented at UC San Diego Neurosciences Graduate Program Research Rounds. La Jolla, CA.

## Service

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| UCSD Neurosciences Graduate Program Admissions Committee | 2012-2014 |
| UCSD Neurosciences Graduate Program Executive Committee | 2010-2012 |
| UCSD Neurosciences Graduate Program Outreach Volunteer | 2010-present |
| UCSD Neurosciences Graduate Program Peer Advisory Committee | 2010-present |

## Research Techniques

Literate in: Matlab, Python, C++, Spike2, and Igor programming languages.
Surgery in Small Animals (birds, fish, mice, leeches).
In-vivo whole cell electrophysiology.
Multi-channel extracellular electrophysiology.
Basic histology techniques in tissue processing and labeling.
Behavioral Conditioning Techniques.
Machine learning tools.