

# Charles R. Heller

charles.heller@tuebingen.mpg.de · +1 952-607-7152

Max Planck Institute for Biological Cybernetics  
Max-Planck-Ring 8-14, 72076 Tbingen

## EDUCATION

---

<b>Oregon Health and Science University</b> , Portland, OR Neuroscience, Ph.D	2016 to 2021
<b>Saint Olaf College</b> , Northfield, MN Physics, B.A.	2012 to 2016

## SCIENTIFIC SKILLS

---

*Laboratory proficiencies:* In-vivo electrophysiology, in-vitro electrophysiology, calcium imaging, behavioral training, spike sorting, multi-unit data analysis, multi-electrode array recording, basic electronics

*Computer proficiencies:* Python, Julia, Rust, MongoDB, MySQL, MATLAB, R, PHP

*Additional tools:* Git, Linux, LaTeX

## RESEARCH EXPERIENCE

---

Postdoctoral Researcher – Drs. Jennifer Li & Drew Robson, MPI	2021 to Present
Doctoral Student – Dr. Stephen David, OHSU	2017 to 2021
Graduate Research Assistant – Dr. Henrique von Gersdorff, OHSU	2017
Undergraduate Research Assistant – Dr. Jay Demas, St. Olaf College	2014 to 2017
Independent Research – Dr. Kevin Crisp, St. Olaf College	2015 to 2016

## AWARDS AND FELLOWSHIPS

---

Paper of the month - OHSU School of Medicine	2021
Travel Award – Association for Research in Otolaryngology (ARO)	2020
Travel Award – Advances and Perspectives in Auditory Neuroscience (APAN)	2018
N.L. Tartar Trust Fellowship	2018
Neuroscience Graduate Program Student Achievement Award	2018
Graduate Research Fellowship, National Science Foundation (NSF GRFP)	2018
Achievement Rewards for College Scientists (ARCS) Foundation Scholar	2017
Matthew J Vogel Scholarship	2014
Hauge Family Endowed Scholarship	2013
St. Olaf Academic Scholarship	2012

## PROFESSIONAL DEVELOPMENT

---

Advanced Neural Data Analysis - G-Node	2019
Summer Workshop on the Dynamic Brain - Allen Institute	2017

## TEACHING EXPERIENCE

---

Python programming in experimental neuroscience, TA, OHSU	2018
Python programming bootcamp, co-organizer and TA, OHSU	2018
Cellular neurophysiology, TA, OHSU	2017
Cellular and molecular neuroscience, TA, St. Olaf College	2016
Academic Support Center, Physics tutor, St Olaf College	2015 to 2016

## COMMUNITY OUTREACH

---

Minds Matter Portland, High School Mentor

2016 to 2019

## PROFESSIONAL MEMBERSHIP

---

Association for Research in Otolaryngology  
 Society for Neuroscience  
 Nu Rho Psi

2019 to 2021  
 2014 to Present  
 2014 to Present

## PUBLICATIONS

---

- Heller C. R.** & David, S. V. (2022). Targeted dimensionality reduction enables reliable estimation of neural population coding accuracy from trial-limited data. *PloS one* doi: 10.1371/journal.pone.0271136
- Saderi D., Schwartz Z. P., **Heller C. R.**, Pennington J. R., & David, S. V. (2021). Dissociation of task engagement and arousal effects in auditory cortex and midbrain. *eLife* doi: 10.7554/eLife.60153
- Heller, C. R.**, Schwartz Z. P., Saderi, D., & David, S. V. (2020). Selective effects of arousal on population coding of natural sounds in auditory cortex. *bioRxiv* doi: 10.1101/2020.08.31.276584
- Heller C. R.** & Crisp K. (2016). A Hodgkin-Huxley model for conduction velocity in the medial giant fiber of the earthworm, *Lumbricus terrestris*. *IMPULSE*,1:9
- Tien N. W., Pearson J. T., **Heller C. R.**, Demas J., & Kerschensteiner D. (2015). Genetically Identified Suppressed-by-Contrast Retinal Ganglion Cells Reliably Signal Self-Generated Visual Stimuli. *The Journal of Neuroscience*,35(30), 10815-10820.

## SELECTED ABSTRACTS

---

- Heller C. R.**, Saderi D, David, S. V. Task-related suppression of correlated variability in A1 predicts behavior performance but not changes in neural discrimination. Virtual: Computational and Systems Neuroscience (COSYNE), 2021
- Heller C. R.**, Saderi D, López Espejo M., David, S. V. Task engagement selectively enhances population discrimination of behavior-relevant categories in primary auditory cortex. Denver, CO: Computational and Systems Neuroscience (COSYNE), 2020
- Heller C. R.**, Saderi D, Schwartz Z. P., David, S. V. Effects of arousal on population coding of natural sounds in primary auditory cortex. San Jose, CA: Association for Research in Otolaryngology (ARO), 2020
- Heller C. R.**, Saderi D, Schwartz Z. P., David, S. V. Effects of arousal on population coding of natural sounds in primary auditory cortex. Chicago, IL: Society for Neuroscience, 2019
- Heller C. R.**, Saderi D, Schwartz Z. P., David, S. V. Arousal enhances reliability of population coding in primary auditory cortex. Lisbon, PT: Computational and Systems Neuroscience (COSYNE), 2019
- Heller C. R.**, Saderi D, Schwartz Z. P., David, S. V. Arousal-dependent variability of correlated neural activity in primary auditory cortex. Baltimore, MD: Association for Research in Otolaryngology (ARO), 2019
- Heller C. R.**, Saderi D, Schwartz Z. P., David, S. V. Behavior state-dependence of correlated neural population activity in ferret primary auditory cortex. San Diego, CA: Society for Neuroscience, 2018
- Heller C. R.**, Saderi D, Schwartz Z. P., David, S. V. Behavior state-dependence of neural variability in ferret primary auditory cortex. San Diego, CA: Advances and Perspectives in Auditory Neuroscience, 2018
- Heller C. R.**, Behling S, Sutter E, Ulanday, E, Demas, J. Identifying and characterizing intrinsically photosensitive retinal ganglion cells in the common snapping turtle, *Chelydra serpentina*. Chicago, IL: Society for Neuroscience, 2015
- Tien N. W., Pearson J. T., **Heller C. R.**, Demas J., Kerschensteiner D. Genetically identified suppressed by contrast retinal ganglion cells in mice reliably signal self-generated visual stimuli. Chicago, IL: Society for Neuroscience, 2015
- Heller C. R.**, Crisp, K. A Hodgkin-Huxley model for conduction velocity in the medial giant fiber of the earthworm, *Lumbricus terrestris*. Chicago, IL: Faculty for Undergraduate Neuroscience, 2015
- Heller C. R.**, Behling S, Sutter E, Ulanday, E, Demas, J. Characterization of phototactic behavior in hatchling snapping turtles (*Chelydra serpentina*). Chicago, IL: Faculty for Undergraduate Neuroscience, 2015
- Heller C. R.**, Behling S, Demas, J. Retinal circuitry underlying hatchling turtle navigation. Washington, D.C.: Faculty for Undergraduate Neuroscience, 2014