

# Jereme Wingert

PhD candidate in Behavioral and Systems Neuroscience

Oregon Health & Science University · Portland, Oregon

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Systems and computational neuroscience of auditory coding during natural behavior, with experience in large-scale electrophysiology, neural encoding models, and research software.

## EDUCATION

### Oregon Health & Science University

2021–present

PhD candidate, Behavioral and Systems Neuroscience · Expected completion February 2027

Advisor: Stephen V. David, PhD. Dissertation focus: acoustic and behavioral contributions to auditory cortical encoding during free movement.

### Washington State University Vancouver

May 2018

BS in Neuroscience · Minor in Chemistry

## RESEARCH EXPERIENCE

### Oregon Health & Science University

Sep 2021–present

Graduate researcher · Advisor: Stephen V. David, PhD

- Investigate how acoustics, movement, and behavioral context shape auditory cortical activity in freely moving ferrets.
- Perform semi-chronic Neuropixels recordings in freely behaving and head-fixed ferrets; combine neural recordings with DeepLabCut pose tracking.
- Develop and evaluate neural encoding and decoding models in Python, including acoustic forward models and analyses of movement-related and laminar response structure.
- Developed neurophysiological methods, performed experiments, and analyzed data for a 2026 Nature Neuroscience study of local auditory-circuit encoding subspaces.

### Legacy Research Institute

Jul 2019–Sep 2021

Research Assistant III · Advisor: Barbara A. Sorg, PhD

### Washington State University Vancouver

Jul 2016–Jul 2019

Research Aide 1, Jan–Jul 2019; Professional Worker II, May 2018–Jan 2019; Undergraduate researcher, Jul 2016–May 2018 · Advisor: Barbara A. Sorg, PhD

- Studied how perineuronal nets and memory reactivation affect cocaine-associated memories, drug-seeking behavior, and medial prefrontal cortical oscillations.
- Combined rat self-administration, intracranial manipulations, local field potential recordings, and neural time-series analysis in MATLAB.

## TECHNICAL EXPERTISE

Neural methods: Neuropixels and local field potential recording; stereotaxic surgery; chronic cannula and electrode implantation; intravenous catheterization; viral DREADD manipulations; intracortical, intramuscular, and intraperitoneal injections.

Analysis and laboratory methods: Python, MATLAB, neural encoding and decoding, digital signal processing, DeepLabCut, confocal microscopy and LAS X, immunohistochemistry, cryostat and microtome sectioning, gel electrophoresis, Western blotting, and construction of microdrives, microwire arrays, and tetrodes.

## PEER REVIEWED PUBLICATIONS

\* *Equal contribution*

**Wingert JC\***, Parida S\*, Norman-Haignere SV, David SV. Convolutional neural network models describe the encoding subspace of local circuits in auditory cortex. *Nature Neuroscience*. 2026;29:876–887. doi:10.1038/s41593-026-02216-0

Hamersky GR, Shaheen LA, López Espejo M, **Wingert JC**, David SV. Reduced Neural Responses to Natural Foreground versus Background Sounds in the Auditory Cortex. *Journal of Neuroscience*. 2025;45(10):e0121242024. doi:10.1523/JNEUROSCI.0121-24.2024

**Wingert JC**, Ramos JD, Reynolds SX, Gonzalez AE, Rose RM, Hegarty DM, Aicher SA, Bailey LG, Brown TE, Abbas AI, Sorg BA. Perineuronal Nets in the Rat Medial Prefrontal Cortex Alter Hippocampal-Prefrontal Oscillations and Reshape Cocaine Self-Administration Memories. *Journal of Neuroscience*. 2024;44(34):e0468242024. doi:10.1523/JNEUROSCI.0468-24.2024

**Wingert JC**, Anguiano JN, Ramos JD, Blacktop JM, Gonzalez AE, Churchill L, Sorg BA. Enhanced expression of parvalbumin and perineuronal nets in the medial prefrontal cortex after extended-access cocaine self-administration in rats. *Addiction Biology*. 2023;28(11):e13334. doi:10.1111/adb.13334

**Wingert JC**, Sorg BA. Impact of Perineuronal Nets on Electrophysiology of Parvalbumin Interneurons, Principal Neurons, and Brain Oscillations: A Review. *Frontiers in Synaptic Neuroscience*. 2021;13:673210. doi:10.3389/fnsyn.2021.673210

## PREPRINTS AND SUBMITTED MANUSCRIPTS

Parida S, **Wingert JC**, Stickney JD, David SV. A low-dimensional, generalizable encoding manifold for auditory cortex. *bioRxiv*. Posted September 3, 2026. Preprint. doi:10.64898/2026.08.30.747962

Zou A, **Wingert JC**, David SV. Organization of binaural spectrotemporal tuning in primary auditory cortex. *Hearing Research*. Submitted.

## PUBLISHED CONFERENCE ABSTRACTS

Sorg B, Ramos J, Wingert J, Reynolds S. Perineuronal Net Removal in Rat Prefrontal Cortex Alters Ripple Spindle Coupling in NREM Sleep After Cocaine. *Sleep*. 2025;48(Suppl 1):A60. Abstract 0133. doi:10.1093/sleep/zsaf090.0133

Sorg BA, Wingert J, Gonzalez AE, Anguiano J, Harkness JH, Aicher SA, Hegarty DM, Jorgensen ET, Brown TE. Perineuronal nets and plasticity in cocaine-associated memories. *Alcoholism: Clinical and Experimental Research*. 2021;45(Suppl 1):74A. Abstract 267.

## FELLOWSHIPS AND AWARDS

**NSF Graduate Research Fellowship** 2022  
National Science Foundation · Three-year fellowship

**Outstanding Research Award** Spring 2018  
Washington State University Vancouver Neuroscience Program

**Undergraduate Research Fellowship** Fall 2017  
Alcohol and Drug Abuse Research Program, Washington State University · \$5,482

Project: “What’s Your Net Worth: Reconsolidation and Cocaine-associated Gamma Oscillations Induced by Removal of Perineuronal Nets.”

**Best Student Poster Presentation** Spring 2017  
Society for Neuroscience Oregon/Southwest Washington Chapter Meeting

## SCIENTIFIC SOFTWARE

### Electrophysiology based depth assignment

Developed a GUI for assigning cortical depth to multielectrode silicon-probe recordings using current-source-density and spectral landmarks, with piecewise-linear registration to account for probe angle and laminar thickness.

### Histology alignment

Developed image-alignment tools combining SIFT feature matching with manual marker adjustment.

### Animal tracking job management

Developed a database-integrated animal-tracking job manager to monitor retraining needs as new data arrive and track model updates and versions.

### Tonotopic mapping

Developed a tool for mapping frequency organization in auditory cortex.

### Dot Motion Lab

Built a browser-based motion-discrimination task for teaching psychophysics, with randomized coherence trials, reaction-time and accuracy measures, a psychometric plot, and CSV export. [Public code](#)

### Head Wave Simulation

Built a Python prototype for exploring binaural acoustics, measured SOFA head-related transfer functions, and sound-field visualizations. [Public code](#)

## RESEARCH MENTORING

### Confocal microscopy and LAS X

2017 and 2019

Trained Angela Gonzalez and Jonathan Anguiano in imaging labeled prefrontal cortical tissue using a Leica confocal microscope.

### Frozen tissue sectioning

2017

Trained Holly D'Andrea in sectioning rat prefrontal cortex using a Leica freezing microtome.

### Intravenous catheterization

2018–2020

Trained Daniel Salazar, Jonathan Anguiano, and Angela Gonzalez in catheterization surgery for self-administration studies.

### Stereotaxic viral microinjection

2019

Trained Jonathan Anguiano in stereotaxic viral microinjection surgery.

## TRAVEL AWARDS

### Faculty for Undergraduate Neuroscience

Summer 2018

Undergraduate Student Travel Award · \$750

### Washington State University

Fall 2017

Office of Undergraduate Research Travel Award · \$400

### Associated Students of Washington State University

Spring 2017

Undergraduate Travel Grant · \$500

## ORAL PRESENTATIONS

**Wingert J.** Increasing Neuroplasticity to Reduce Drug Addiction Memories. *Oregon Bio Digital 2020, Oregon Bioscience Association. Virtual conference.*

**Wingert J.,** Harkness J., Todd RP, Sorg BA. Perineuronal Net Removal Decreases Cue-induced Reinstatement in Cocaine Self-administering Rats. *Society for Neuroscience 2018. Nanosymposium on Circuitry and Cell-Type Specific Neurophysiology of Addiction, program 632.12. San Diego, CA.*

**Wingert J.,** Harkness J., Todd RP, Sorg BA. Perineuronal Net Removal Decreases Cue-induced Reinstatement in Cocaine Self-administering Rats. *Society for Neuroscience Oregon/Southwest Washington Chapter, 2018. Troutdale, OR.*

**Wingert J.,** Harkness J., Todd RP, Sorg BA. The Fight for Net Neutrality: PNNs, Memory, and Addiction. *Washington State University Vancouver Biomedical Sciences Seminar, 2017. Vancouver, WA.*

## POSTER PRESENTATIONS

**Wingert J.,** Harkness J., Gonzalez A., Ramos J., Sorg BA. Impact of perineuronal net removal on cue-induced reinstatement in cocaine self-administering rats is dependent on memory reactivation parameters. *International Behavioral Neuroscience Society, 2020. Online poster sessions.*

**Wingert J.,** Harkness J., Gonzalez A., Todd RP, Sorg BA. Pre- and post-reactivation perineuronal net removal differentially alters cue-reinstatement response in cocaine self-administering rats. *Society for Neuroscience 2019, program 157.05/U31. Chicago, IL.*

**Wingert J.,** Harkness J., Todd RP, Sorg BA. Perineuronal Net Removal Decreases Cue-induced Reinstatement in Cocaine Self-administering Rats. *Faculty for Undergraduate Neuroscience Poster Session and Social, Society for Neuroscience 2018. San Diego, CA.*

**Wingert J.,** Harkness J., Todd RP, Sorg BA. Perineuronal Net Removal Decreases Cue-induced Reinstatement in Cocaine Self-administering Rats. *Washington State University Vancouver Research Showcase, 2018. Vancouver, WA.*

**Wingert J.,** Harkness J., Todd RP, Sorg BA. Perineuronal Net Removal Decreases Cue-induced Reinstatement in Cocaine Self-administering Rats. *Society for Neuroscience 2017, program 704.10/SS1. Washington, DC.*

**Wingert J.,** Harkness J., Todd RP, Sorg BA. Perineuronal Net Removal Decreases Cue-induced Reinstatement in Cocaine Self-administering Rats. *Society for Neuroscience Oregon/Southwest Washington Chapter, 2017. Troutdale, OR.*

## REFERENCES

Stephen V. David, PhD · Oregon Health & Science University · [davids@ohsu.edu](mailto:davids@ohsu.edu)

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