

Andrew K. Moran

Postdoctoral Fellow

University of Colorado, Anschutz Medical Campus

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Education

Recd. 2020: Ph.D., Neuroscience, University of Utah

Dissertation Title: *“Optical Analysis of Odor-Driven Glutamate Dynamics in Circuits of the Mammalian Olfactory Bulb”*

Recd. 2012: B.A., Psychology, Minor: Neuroscience, University of California, Riverside

Recd. 2009: A.S. and A.A., Natural Sciences/IGETC, Riverside Community College

Independent Research Funding/Honors/Awards

2021: Postdoctoral Travel Fellowship (CU Denver/Anschutz Postdoctoral Association)

2020-2022: NIH NIDCD University of Colorado, Anschutz Medical Campus Otolaryngology T32 Recipient

2019, 2020: Don Tucker Award Finalist, AChemS (Association for Chemoreception Sciences) Annual Meeting

2016, 2019, 2022: AChemS Annual Meeting Diversity Travel Award Recipient

2015-2018: NIH R01-13S1 NIDCD Diversity Supplemental for Predoctoral Fellows Recipient

2013-2015: NIH NINDS University of Utah Neuroscience T32 Recipient

2013: University of California, Los Angeles Psychology Undergraduate Researcher Conference (PURC) Presenter Award

Chosen Conference Presentations

Moran, A.K., Teel, A., Williamson, R., Person, A., Restrepo, D. “Extracting positional information in an odor-guided droplet reach task” Association for Chemosensory Sciences (AChemS) Annual Conference, April 2022

Moran A.K., Eiting T.P, Wachowiak, M “Diverse dynamics of glutamatergic input from sensory neurons underlie heterogeneous responses of olfactory bulb outputs in vivo” International Symposium on Taste and Smell (ISOT) Conference Presentation, Online, 2020

Moran A.K., Wachowiak, M “In vivo optical dissection of glutamatergic signaling underlying odor responses of olfactory bulb output neurons” Society for Neuroscience General Conference Presentation, Washington, DC 2017

Richards. J.R, **Moran, A.K.**, Kummer B., Wachowiak, M “Using pharmacogenetic tools to manipulate odor perception in mice” SACNAS General Conference Presentation, Salt Lake City, UT October 2017

Tsosie J., **Moran, A.K.**, Wachowiak, M “Measuring Conditioned Odor Preference Behavior in a Mouse Model of Nicotine Administration” SACNAS General Conference Presentation October 2016

Moran, A.K., Gonzalez, L, Huffman, K.J “Development of Callosal Connections in CD-1 Mice” UCLA Psychology Undergraduate Research Conference Presentation May 2013

Publications/Preprints/Manuscripts

Moran, A.K., Teel, A., Williamson, R., Person, A., Restrepo, D. Active sensing in orofacial regions promotes proper reach kinematics and targeting, in preparation

Moran, A.K., Person, A., Restrepo, D., Underlying cerebellar contributions to olfactocentric orofacial behaviors, in preparation

McCullough, C.M, Ramirez-Gordillo, D., Hall M., Futia G.L, **Moran, A.K.**, Gibson E.A, Restrepo D. GRINtrode: A neural implant for simultaneous two-photon imaging and extracellular electrophysiology in freely moving animals, in submission

Moran, A.K., Eiting, T.P, Wachowiak, M. Circuit Contributions to Sensory-Driven Glutamatergic Drive of Olfactory Bulb Mitral and Tufted Cells During Odorant Inhalation. *Front Neural Circuits*, 2021 Oct 27;15:779056. doi: 10.3389/fncir.2021.779056. eCollection 2021.

Moran, A.K., Eiting, T.P, Wachowiak, M. Dynamics of Glutamatergic Drive Underlie Diverse Responses of Olfactory Bulb Outputs In Vivo. *eNeuro* 8, doi:10.1523/ENEURO.0110-21.2021 (2021).

Research Career Experience

2020-present: Postdoctoral Fellow, Dr. Diego Restrepo, University of Colorado, Anschutz Medical Campus: Investigating early cerebellar circuitry contributing to odor-guided reaching.

2013-2020: Graduate Student Researcher, Dr. Matt Wachowiak, University of Utah: Dissecting glutamatergic microcircuitry underlying glomerular processing of odors across the olfactory bulb *in vivo*.

2009-2013: Postbaccalaureate Research Assistant, Dr. Kelly Huffman, UC Riverside: Development of interneocortical connections in prenatally ethanol-exposed, CD1 mice.

2011-2012: Research Assistant, Dr. Aaron Seitz, UC Riverside: Mapping perceptual learning through multitask and distraction behavior using EEG.

Research Skills and Expertise

Model systems: Human & Mice

Animal Surgeries for Neurophysiology: Olfactory bulb, Piriform Cortex, Neocortex, & Cerebellum

Single- and Two-Photon Functional Imaging of Neural Activity in Mice

Functional Indicators: GCaMP, iGluSnFR (orig. and SF), jRGECO1a, simultaneous dual indicator imaging

Brain Areas: Olfactory bulb, Neocortex (M1), Cerebellum

Pharmacology (in vivo): (Glutamatergic blockers (ionotropic), catecholaminergic blockers (dopaminergic and cholinergic)

Neuronal Activity Manipulators: Chemogenetics: hM4DG; | Optogenetics: ChR2.H134R, CheTA

Electrophysiology: Extracellular, *in vivo mouse*; Intracellular/Whole Cell, *in vitro mouse retina*; EEG, *human*

Programming Languages/Environments for Data Processing/Organization/Analysis: MATLAB (proficient), Labview (proficient), SQL (functional), Python (functional), Linux (Ubuntu, Red Hat), Bash (functional)

Behavior: Mice: Droplet/Pellet reach task, Odor-preference task, Two-choice odor discrimination task, Suok anxiety task, Elevated-plus maze Human: Distractor/Target detection task

Additional skills: Grant writing, Microsoft Office Suite, Adobe Suite, LaTeX, Science/Intrapersonal communication

Mentoring

2020-present: Alec Teel, Professional Research Assistant at CU Anschutz; taught animal handling and surgeries, odor-guided reach experiments in mice, data extraction (i.e., training neural nets for object tracking and pose estimation)

2017-2018: Jaime Richards, Visiting NARI (Native American Research Internship) Intern at University of Utah; taught conducting of odor discrimination behavioral experiments in mice, animal handling, chemogenetic utilization, circuit building, data analysis and research presentation techniques

Summer 2016: Jakob Tsosie, Visiting NARI Intern at University of Utah; taught conducting of odor preference behavior tasks in mice, animal handling, data analysis, and research presentation techniques

2015-2016: Mia Wipfel, Bioengineering Undergraduate at University of Utah; taught LabView coding, animal handling, microscopy, and histological techniques

2013-2014: Jackson Ball, Lab Technician at University of Utah; taught mouse colony maintenance, histology, microscopy and surgical techniques for use in olfactory experiments in mice

2011-2013: Liliana Gonzalez, Psychology/Neuroscience Undergraduate at UC Riverside; taught histology and microscopy techniques, and data analysis methods

Teaching Experience

Teaching Assistant, University of Utah

Neuroscience 6050: Systems Neuroscience. Assisted in grading, teaching, and mentoring students studying neural circuits and organization of brain systems (1 semester)

Guest Lecturer, University of Utah

Neuroscience 6050: Systems Neuroscience. Taught a lecture on chemosensory systems (olfaction and gustation) from a circuitry and perceptual coding viewpoint (1 lecture)

Psychology 3700: Drugs and Behavior. Taught a lecture on nicotine and its effect on the brain from receptor to systems level concepts as well as neuroanatomy (1 lecture)

Societies, Memberships, and Roles

2020-2022: CU Denver/Anschutz Postdoctoral Slack Channel (#neuropostdocs) **Moderator**

2019-2021: AChemS Social Media Committee, **Member**

2017-2018: University of Utah, Snowbird Symposium; **Chair**, *“Of Mind and Math: Big Data Analysis and Computational Approaches in Neuroscience”*

2017-present: Society for Neuroscience (SfN); **Member**

2016-2017: University of Utah, Snowbird Symposium; **Chair**, *“The Role of Epigenetics in Neuroscience”*

2015-2016: University of Utah, Snowbird Symposium; **Member**

2015-2016: University of Utah Neurobiology and Anatomy Seminar Series **Co-Coordinator**

2014-present: AChemS (Association for Chemoreception Sciences) **Member**

2014-2015: University of Utah Interdepartmental Neuroscience Program (INP) Recruitment Committee **Co-Coordinator**

2013-present: American Association for the Advancement of Science (AAAS) **Member**

2013-present: Society for the Advancement of Chicano and Native Americans in Science (SACNAS) **Member** (University of Utah Chapter)

2013-2019: University of Utah INP Fundraising Committee, Social/Retreat, and Seminar Series **Committee Member**

2012-2013: UCR Neuroscience Journal Club **Coordinator**

2010-2012: Psi Chi (National Honor Society in Psychology) **Member**

Outreach

2016-2017: SLC Brain Bee: University of Utah **Co-Coordinator**, coordinated demonstration stations for graduate students to teach youth about neuroscience prior to Brain Bee competition.

2013-2019: Brain Awareness Week: University of Utah **Volunteer**; taught elementary, junior high, and high school students about neuroscience through hands-on demonstrations

2011-2013: Brain Awareness Day **Volunteer**: University of California, Riverside; demonstrated the vestibular system function and anatomy to underprivileged youth through hands on direction

References

Dr. Dale Matthew Wachowiak (PhD Supervisor)

USTAR Professor

Department of Neurobiology and Anatomy, University of Utah

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Dr. Diego Restrepo (Postdoctoral Mentor)

Professor

Department of Cell and Developmental Biology, University of Colorado, Anschutz Medical Campus

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Dr. Abigail Person (Postdoctoral Co-mentor)

Associate Professor

Department of Physiology and Biophysics, University of Colorado, Anschutz Medical Campus

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