

Curriculum Vitae

Heather J. Rhodes

Nee: Heather J. Chisum

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Current Position

Associate Professor, Department of Biology and Neuroscience Program, Denison University
(began position 2008, granted tenure 2015).

Director, Neuroscience Program, Denison University (2017-present).

Primary teaching responsibilities: Multicellular life (BIOL-220), Comparative Physiology (BIOL-334), Neurophysiology (BIOL-349), Neuroscience Senior Capstone Seminar (NEUR 412).

Research Program: Understanding the neural and hormonal control of social and reproductive behavior in the African clawed frog (*Xenopus laevis*).

Service Highlights: Member of the HESS Steering Committee, member of the Service Learning Advisory Committee, member of the search committees for multiple tenure-track and visiting faculty searches, member of the Education Council and the STEM Ecosystem at The Works, mentor for Preparing Future Faculty at OSU, led Women in Science professional development groups at multiple institutions, organized and led the Cephalopod Research Discussion Group at the Marine Biological Laboratories, Woods Hole MA.

Education

2003 Ph.D. in Neurobiology from Duke University, Durham, NC, working in the laboratory of David Fitzpatrick. Dissertation title: *Stimulus interactions: A functional test of circuitry in primary visual cortex*.

2002 Teaching Certificate in College Biology, Duke University, Durham, NC.

1999 Summer course: The structure, function, and development of the visual system. Cold Spring Harbor Laboratories, NY.

1996 B.S. in Animal Physiology and Neuroscience with a minor in Psychology from John Muir College at the University of California, San Diego.

1995 University of California Education Abroad Program: Studied for one year at the University of Melbourne, Australia. Course of study: Neuroscience.

Fellowships and Awards

2017-2018 Associate Director of the Grass Fellowship Laboratory at the Marine Biological Laboratories in Woods Hole, MA. This position included research support, housing, and funding for one undergraduate student per year, leading to a total award of ~\$100,000 over two years.

- 2017 Grass Foundation Neuroscience Educational Outreach Grant “Creating Sustainable Neuroscience Education at the Secondary School Level, Globally (phase 1) and Locally (phase 2)” in the amount of \$2184.84, with an additional \$1000 from Denison’s Alford Center for Service and Experiential learning for a total budget of \$3184.84.
- 2017 Pay-It-Forward Grant from Ohio Campus Compact for student philanthropy as part of a course in science educational outreach, in the amount of \$2000.
- 2016 Pedagogical Practice Project “Using science in the media as a gateway to the primary literature” in the amount of \$1500 from the Center for Learning and Teaching, Denison University.
- 2016 Pedagogical Practice – Service and Experiential Learning Award for “The use of directed study courses to create an interdisciplinary service learning experience for Denison students.” in the amount of \$1000 from the Alford Center, Denison University.
- 2013 Nominee for Denison DCGA Faculty Member of the Year Award.
- 2010 Denison University Research Foundation award for the project “Hormones and Social Signaling in the African Clawed Frog (*Xenopus laevis*)” in the amount of \$10,258.
- 2006-2008 Individual Postdoctoral National Research Service Award (NRSA), NIH/NINDS for the project “Neuronal control of sex-specific vocal-motor behavior” in the amount of \$48,796.
- 2006 Grass Fellowship in Neuroscience for independent research at the Marine Biological Laboratories, Woods Hole, MA, for the project “Searching for the Central Pattern Generator in the Vocal System of *Xenopus laevis*.”
- 2005 Gordon Conference Travel Award from the Chair’s Fund to attend and present at the Neuroethology Gordon Conference, Oxford, UK.
- 2000 and 2001 Duke Graduate School Travel Award to attend and present at the Society for Neuroscience meetings.
- 1994 Howard Hughes Undergraduate Summer Research Fellowship to work with Dr. Dennis O’Leary at the Salk Institute for Biological Studies, San Diego, CA.

Prior Research and Technical Positions

- 2004-2007 Postdoctoral Researcher, PI: Ayako Yamaguchi, Department of Biology, Boston University, Boston, MA.
- 2004 Postdoctoral Researcher, PI: David Fitzpatrick, Department of Neurobiology, Duke University, Durham, NC.
- 1997-2003 Graduate Student Researcher, PI: David Fitzpatrick, Department of Neurobiology, Duke University, Durham, NC.
- 1995 Laboratory Technician for the developmental neurobiology laboratories, University of Melbourne, Australia.
- 1994 Howard Hughes Undergraduate Research Fellow with the Molecular Neurobiology Laboratory, PI: Dennis O’Leary, The Salk Institute for Biological Studies, San Diego, CA.
- 1993-1994, 1996-1997 Research Assistant in the Laboratory for Research on the Neuroscience of Autism, PI: Eric Courchesne, University of California and Children’s Hospital, San Diego, CA.

Prior Teaching and Mentoring Positions

2006 Guest lecturer for Neurobiology at Bowdoin College, Brunswick, ME.
2005 and 2006 Volunteer science educator, Brookline Public Schools, Brookline, MA.
2004 and 2006 Guest lecturer for Neuroethology, Boston University, MA.
2000 Sole instructor for Psychobiology (lecture and lab), Guilford College, Greensboro, NC.
2000 Mentor for junior high girls through the Women and Mathematics mentoring program, Durham, NC.
1999-2000 Volunteer tutor for grades K-12 with Markham Chapel Community Enrichment Tutoring Program, Durham, NC.
1999 (fall) Assistant instructor for Fundamentals of Neuroscience, Duke University.
1999 (spring) Guest lecturer for Introductory Psychology, University of North Carolina, Chapel Hill.
1999 (winter) Teaching assistant for Neurobiology, Duke University School of Medicine.

Professional Societies & Memberships

1998-present Member of the Society for Neuroscience.
2012-present Member of the International Society for Neuroethology.
2008-present Member of Denison's Women in Science.
2011 Member of the Society for Integrative and Comparative Biology.
2006-2007 Member of Boston University's Woman in Biology.
2003-2005 Member of the American Association of University Women.
2001-2002 Program Coordinator for Women in Science and Engineering, Duke University Women's Center, Durham, NC.
1999-2003 Member of Preparing Future Faculty, Duke University, Durham, NC.

Scientific Research and Review Articles

Kelley, D.B, Elliott, T.M., Evans, B.J., Hall, I.C., Leininger, E.C., **Rhodes, H.J.**, Yamaguchi, A. & Zornik, E. (2017). Probing forebrain to hindbrain circuit functions in *Xenopus*. *Genesis*, 55: e22999.

Rhodes, H.J., Stevenson, R.J. & Ego, C.L. (2014). Male-male clasping may be part of an alternative reproductive tactic in *Xenopus laevis*. *PLoS ONE*, 9(5): e97761.

VanHooser, S., Roy, A., **Rhodes, H.J.**, Culp, J. & Fitzpatrick, D. (2013). Transformation of receptive field properties from lateral geniculate nucleus to superficial V1 in the tree shrew. *J Neurosci*, 33(28): 11494-11505.

Zornik, E., Katzen, A., **Rhodes, H.J.** & Yamaguchi, A. (2010). NMDAR-dependent control of call duration in *Xenopus laevis*. *J Neurophysiol* 103(6): 3501-3515.

Rhodes, H.J., Yu, H.J. & Yamaguchi, A. (2007) *Xenopus* vocalizations are controlled by a sexually differentiated hindbrain central pattern generator. *J Neurosci*, 27(6):1485-1497.

Chisum, H.J. & Fitzpatrick, D. (2004). The contribution of vertical and horizontal connections to the receptive field center and surround in V1. *Neural Networks*, 17(5-6):681-93.

Chisum, H.J., Mooser, F. & Fitzpatrick, D. (2003). Emergent properties of layer 2/3 neurons reflect the collinear arrangement of horizontal connections in tree shrew visual cortex. *J Neurosci*, 23(7):2947-2960.

- Courchesne, E., Karns, C., Davis, H., Ziccardi, R., Carper, R., Tigue, Z., **Chisum, H.J.**, Moses, P., Pierce, K., Lord, C., Lincoln, A.J., Pizzo, S., Schreibman, L., Haas, R.H., Akshoomoff, N.A., Courchesne, R.Y. (2001). Unusual brain growth patterns in early life in patients with autistic disorder: An MRI study. *Neurology*, 57: 245-54.
- Courchesne, E., **Chisum, H.J.**, Townsend, J., Cowles, A., Covington, J., Egaas, B., Harwood, M., Hinds, S., Press, G.A. (2000). Normal brain development and aging: quantitative analysis at *in vivo* MR imaging in healthy volunteers. *Radiology*, 216:672-682.
- Courchesne, E., **Chisum, H.** & Townsend, J. (1994). Neural activity-dependent brain changes in development: Implications for psychopathology. *Development and Psychopathology*, 6:697-722.

Book Chapters

- Chisum, H.J.** & Fitzpatrick, D. (2004). The contribution of vertical and horizontal connections to the receptive field center and surround in V1. In: *Vision and brain: how the brain sees/new approaches to computer vision* (Grossberg, S., Finkel, L. & Field, D., eds). Oxford, UK: Elsevier Scientific.

Published Abstracts for Scientific Meeting Presentations

- Rhodes, H.J.**, Amo, M. & Darrah, K.M. (2018) Male African clawed frogs show olfactory responses to socially-relevant stimuli. *International Congress on Neuroethology*, Brisbane, Australia, abstract.
- Amo, M. & **Rhodes, H.J.**, (2018) Can *Xenopus laevis* detect social chemical cues? *Animal Behavior Conference*, Indiana University, abstract.
- Darrah, K.M. & **Rhodes, H.J.**, (2017) Development and implementation of electrofactogram apparatus for studying *Xenopus laevis*. *Animal Behavior Conference*, Indiana University, abstract.
- Bradley, S.E. & **Rhodes, H.J.**, (2017) An investigation into the alternative reproductive tactic known as male-male clasping in *Xenopus laevis*. *Animal Behavior Conference*, Indiana University, abstract.
- Rhodes, H.J.**, (2016) Using science in the media as a gateway to the primary literature. *AAC&U Transforming Undergraduate STEM Education: Implications for 21st Century Society*, abstract.
- Rhodes, H.J.**, Ego, C.L., & Esselburn, K.M. (2014) Exogenous AVT suppresses courtship behavior in *Xenopus laevis*. *American Physiological Society Intersociety Meeting: Comparative Approaches to Grand Challenges in Physiology*, abstract.
- Rhodes, H.J.**, Stevenson, R.J. & Ego, C.L. (2013) An evolving understanding of male-male clasping behavior in *Xenopus laevis*. *Gordon Research Conference on Neuroethology: Behavior, Evolution & Neurobiology*, abstract.
- Rhodes, H.J.** & Ramsay, M.J. (2012) Could steroid hormones act as pheromones in the aquatic frog, *Xenopus laevis*? *International Society for Neuroethology*, abstract.
- Stevenson, R.J. & **Rhodes, H.J.** (2012) Investigating *Xenopus laevis* social structure through an analysis of clasping behavior. *International Society for Neuroethology*, abstract.

- Rhodes, H.J. & Ramsay, M.J.** (2012) Could steroid hormones act as pheromones in the aquatic frog, *Xenopus laevis*? *Amphibian Neuroethology Satellite Meeting at the 10th International Congress of Neuroethology*, abstract.
- Ego, C.L., Esselburn, K.M. & Rhodes, H.J.** (2011). Arginine vasotocin alters male-male interactions in *Xenopus laevis*. *Society for Integrative and Comparative Biology*, abstract.
- Zornik, E., Katzen, A., Rhodes, H.J., Yu, H.J. & Yamaguchi, A.** (2010). Synaptic and cellular basis of temporal vocal patterns in the frog, *Xenopus laevis*. *Society for Neuroscience*, abstract.
- Esselburn, K.M., Barone, L.M. & Rhodes, H.J.** (2009). Effects of arginine vasotocin on vocalizations of male *Xenopus laevis*. *Society for Neuroscience*, abstract.
- Rhodes, H.J. & Yamaguchi, A.** (2007) Blocking I_h alters fictive behavior patterns in the vocal system of male *Xenopus*. *International Society for Neuroethology*, abstract.
- Rhodes, H.J. & Yamaguchi, A.** (2006). The role of the premotor nucleus DTAM in the production of fictive song in *Xenopus laevis*. *Society for Neuroscience*, abstract.
- Yamaguchi, A., Walker, H.J. & Rhodes, H.J.** (2006). Sexually distinct vocalizations of African clawed frogs (*Xenopus laevis*) are generated by central pattern generators that are modifiable by androgens. *Society for Neuroscience*, abstract.
- Rhodes, H.J. & Yamaguchi, A.** (2005). I_h regulates neuronal excitability in the vocal-motor system of male *Xenopus*. *Society for Neuroscience*, abstract.
- Rhodes, H.J. & Yamaguchi, A.** (2005). The effects of I_h blockade on the firing patterns of laryngeal motor neurons in *Xenopus laevis*. *Gordon Conference on Neuroethology*, abstract.
- Chisum, H.J. & Fitzpatrick, D.** (2001). Optical imaging of population responses to collinear and non-collinear stimuli in striate cortex. *Society for Neuroscience*, abstract.
- Chisum, H.J., Spor, G., Pucak, M.L. & Fitzpatrick, D.** (2000). The spatial organization of suppression in layer 2/3 neurons of the tree shrew area V1. *Society for Neuroscience*, abstract.
- Fitzpatrick, D., Chisum, H.J., Bosking, W.H. & White, L.E.** (1998). Functional architecture of ferret visual cortex: relation of callosal inputs to identified ocular dominance territories. *Society for Neuroscience*, abstract.
- Singer-Harris, N., Courchesne, E., Carper, R., Chisum, H.J. & Egaas, B.** (1998). Neuroanatomic contributions to slowed orienting of attention in children with autism. *International Neuropsychological Society*, abstract.
- Carper, R., Chisum, H.J. & Courchesne, E.** (1997). Brain and frontal lobe volumes do not differ between autistic subjects and normal controls. *Cognitive Neuroscience Society*, abstract.
- Carper, R., Courchesne, E. & Chisum, H.J.** (1997). Frontal lobe volume correlates with hypoplasia of the cerebellar vermis in young autistic patients. *Society for Neuroscience*, abstract.

Other Published Works

- Rhodes, H.J.**, (2018) Module Five: Implementing Optogenetics in the Classroom. *Society for Neuroscience Optogenetics Training Series*. <http://neuronline.sfn.org/Articles/OTS/Module-5/Implementing-Optogenetics-in-the-Classroom>

Spooner, L., **Rhodes, H.**, Pierce, J., Mickelson, L., (May 27, 2017) Trust the Experts; Teachers Talk Teaching Now. *Between Coasts*. <http://betweencoasts.org/trust-the-experts/>

Rhodes, H.J., (Sept. 13, 2016) Try This! Using science in the media as a gateway to the primary literature. *GLCA/GLAA Consortium for Teaching and Learning*.
<http://glcateachlearn.org/2016/09/13/using-science-in-the-media-as-a-gateway-to-the-primary-literature/>