

CURRICULUM VITAE

Ayako Yamaguchi, Ph.D
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EDUCATIONAL RECORD

1996 Ph.D (Animal Behavior) University of California at Davis (Dr. Peter Marler)
1990 B.S. (Biology) Japan Women's University, Tokyo, Japan

POSITIONS HELD

2013 to present: Associate Professor, School of Biological Sciences, University of Utah
2010 to 2013: Assistant Professor, School of Biological Sciences, University of Utah
2002 to 2010: Assistant Professor, Biology Department, Boston University
2000 to 2002: Postdoc, Department of Pharmacology, Yale School of Med., with Dr. Leonard Kaczmarek
1999 summer: Grass Fellow in Neurobiology, Marine Biological Laboratory, Woods Hole, MA
1997 to 2002: Postdoctoral Fellow, Department of Biological Sciences, Columbia University, with Dr. Darcy Kelley
1996: Postdoc, Department of Physiology, Dokkyo School of Medicine, Japan, with Dr. Hironobu Sakaguchi

RESEARCH SUPPORT

Current:

- 9/1/2021 – 8/31/2024 “Development of viral vectors for amphibian gene delivery and manipulation”. NSF EDGE 210086, Role: Co-PI, Total costs: \$1,000,000
- 2/1/20 – 1/31/24 “Functional analyses of the vocal central pattern generators of African clawed frogs”. NSF IOS 1934386, Role: PI, Total costs: \$ 900,000
- 3/1/20 – 2/28/23 “Investigating opioid insensitivity in the amphibian respiratory system” University of Utah Seed Grant, Role: PI, Total costs: \$30,000

Pending:

9/1/24 – 88/31/27 “Unraveling the roles of microglia and perineuronal nets of androgen-induced neural plasticity in female *X. laevis*”. (NSF IOS 124354, to be submitted to NSF IOS on 2/1/2024)

Past:

- 4/1/16 – 3/31/20 “Functional analyses of the neural circuits underlying vocal production in *Xenopus laevis*” NSF IOS-1557945, Total costs: \$675,671.
- 6/1/12 – 5/31/16 “Neural mechanisms underlying temporal organization in frog vocalizations” NSF IOS-1146501, Total costs: \$375,000
- 1/1/15 – 6/30/16 “Application of optogenetic tools to understand neural mechanisms underlying *Xenopus* vocal production” University of Utah Seed Grant, Total costs: \$35,000
- 6/1/12 – 5/31/16 NSF REU support for the parent grant, NSF IOS-1146501 (Neural mechanisms underlying temporal organization in frog vocalizations), Total costs: \$12,000
- 12/1/04 – 11/30/10 “Androgen modulation of vocal neurons” NIH NIND RO1 NS048834, Total costs : \$1,655,000
- 8/1/06 – 7/31/09 “Neuronal control of sex-specific vocal-motor behavior” NIH NINDS F32 NS054391 (Heather Rhodes, Research Fellow) Total cost : \$151,272
- 4/1/02 – 3/31/03 “Generating sexually distinct vocalizations” Sound Foundation Research Award, Total cost: JP ¥ 1,000,000
- 7/1/99 – 6/30/01 “Neuronal coding of sexually differentiated behavior” NIH NINDS, F32 NS10881 (Ayako Yamaguchi, Research Fellow) Total cost: \$121,492

FELLOWSHIPS, HONORS, AND AWARDS

2002 – 2007 Clare Boothe Luce Professorship, Henry Luce Foundation
1999 – 2002 NIH NRSA Postdoctoral Fellowship
1999 summer Grass Foundation Fellowship in Neurobiology, Grass Foundation
1995 UC Davis graduate student travel award
1994 Tracy & Ruth Ridson Storer Fellowship, UC Davis
1993 – 1993 Sigma-Xi Grant-in-aid of research
1993 – 1994 Chapman fund Research Grant, American Museum of Natural History
1993 Women in Science Scholarship
1993 UC Davis Graduate Student Fellowship
1992 – 1994 P.E.O. International Scholarship

1992 – 1994 Jastro-Shields Research Grants, UC Davis
 1990 – 1993 Non-resident fee waiver fellowship, UC Davis
 1989 Naruse Award, Japan Women's University

INVITED TALKS (past 10 years)

2024 Teikyo University, Cognitive Neuroscience, Japan (host, Kazuo Okanoya)
 Hokkaido University, Department of Biological Sciences, Japan (host, Kazuhiro Wada)
 Queens College, Biology Department (host, Areti Tsimounis)
 2023 Craniofacial Neuroscience Symposium (host, Alyssa Huff)
 Institute of Science and Technology, Austria (host, Lora Sweeney)
 2022 University of Oklahoma, Neuroscience Program (host, Dr. Ari Berkowitz)
 Illinois State University, Department of Biology (host, Dr. Wolfgang Stein)
 Tokyo University Undergraduate Seminar Series (host, Dr. Masato Eto)
 2020 Research highlight for VPR luncheon, University of Utah
 2019 *Xenopus* Resources and Emerging Technologies Meeting, Woods Hole, MA (declined)
 New Genetic Tools for Non-Genetic Model Organism conference, Janelia Research Campus, Ashburn, Virginia
 Michael O'Donovan lab meeting, NIH NINDS, Bethesda, Maryland
 2018 Neuroethology satellite meeting on Pattern Generator in Brisbane, Australia (host, Andy Bass, declined)
 Tokyo University, Department of Cognitive and Behavioral Sciences seminar series, Tokyo, Japan (host, Kazuo Okanoya)
 2018 Hokkaido University, Department of Biological Sciences seminar series, Sapporo, Japan (host, Kazuhiro Wada)
 University of Utah, Department of Biological Sciences departmental seminar
 2015 Columbia University, NeuroLunch, Department of Biological Sciences (host, Darcy Kelley)
 Bioscience Symposium, University of Utah
 2014 Tokyo University, Department of Cognitive and Behavioral Sciences seminar series, Tokyo, Japan (host, Kazuo Okanoya)

CONFERENCE PRESENTATIONS (past 10 years)

2022 International Conference of Neuroethology, Lisbon, Portugal
 2021 The Society of Integrative and Comparative Biology (virtual)
 2020 The Society of Integrative and Comparative Biology, Austin
 2020 Expanding the species range of the vertebrate viral toolbox, organizer, MBL (postponed)
 2019 Engineering and evolving viruses to expand functionality, Janelia Research Campus, Ashburn, Virginia
 2019 Society for Neuroscience, Chicago, IL
 2018 Society for Neuroscience, San Diego, CA
 2017 Society for Neuroscience, Washington, DC
 2016 Society for Neuroscience, San Diego, CA
 2014 International Conference of Neuroethology, Sapporo, Japan
 2013 Society for Neuroscience, San Diego, CA

MEMBERSHIPS

International Society for Neuroethology, Society for Neuroscience

UNIVERSITY SERVICE

OCM Director Search Committee 2020
 Animal care committee, Chair 2015 – 2020 (chair from 2016 to 2020)
 Graduate Admission Committees (University of Utah, Dept of Biology 2017, Neuroscience Graduate Program 2013 - 2016)
 BioURP steering committee (2015)
 Neuroscience Program Seminar Committee (2017)
 Biology Department Curriculum Reform Committee (2015)
 Biology Department Seminar Committee (2014)
 Neurobiology Faculty Search Committee (Boston Univ.)
 Undergraduate Curriculum Committee (Boston Univ.)

OUTSIDE SERVICE

Ad hoc reviewer for Journal of Neuroscience, Journal of Neurobiology, Hormones and Behavior, Journal of Neurophysiology, Journal of Ethology, Nature
 Ad hoc reviewer for the National Science Foundation, the City University of New York research grant

TEACHING

- Comparative Physiology (BIOL 3320), an undergraduate course with 80 students; Fall 2011-2013, 2015-2020, 2022
- Fundamentals of Biology I (BIOL 1610), an undergraduate course with 230 students, Fall 2019
- Biology Bootcamp (BIOL 7964), a graduate course with 17 students; Fall 2018
- Advanced Topics in Ecology and Evolution (BIOL 7964), a graduate course with ~10 students; Spring 2014-2020
- Frontiers in Neuroscience (NEUSC 6010), a graduate course with ~ 10 students; Fall 2012-2018
- Faculty Research Seminars (BIOL 2870), an undergraduate course with ~80 students; Fall 2016, 2017, 2018, 2019
- Neuroethology (BI444/644), an upper level and graduate course with ~25 students; Fall 03, 04, 06, 08, 09 (Boston Univ)
- Systems Physiology (BI315), an introductory course with ~210 students; Fall 09 (Boston Univ)
- Neurobiology of Motivated Behavior (BI545), an undergraduate course with ~30 students; Spring 04 (Boston Univ)

MENTORING

Postdoctoral fellows

Da-Jiang Zheng	2021 – 2022 (currently a research scientist at Repair Biotechnologies, New York)
Paulo Rodrigues	2016 - 2017 (currently a research scientist at the University of Wisconsin)
Erik Zornik	2006 – 2012 (currently a faculty at Reed College)
Heather Rhodes	2004 – 2007 (currently a faculty at Dennison University)
Dawei Zhang	2007 (currently a research fellow at Brigham and Women's Hospital)

Graduate Students

Adara Deniro	2021 - present
Ryota Inagaki	2016 - 2019
Kayla Chandler	2014 – 2015 (the program coordinator, Bioscience graduate program, the U of U)
Sasha Luks-Morgan	2014 (rotating student)
Winnie Pong	2003 (rotating student)
Joseph Oberlander	2004 – 2005 (rotating student)
Heather Yu	2005 – 2010 (currently a faculty at Stonehill College)
Pete Zushin	2008 (rotating student)

Research Technicians

Andrew Maloy	2023 - 2023
Akemi Nguyen	2021 - 2023
Manon Peltier	2018 – 2020 (currently a graduate student at University of Cologne)
Kirsten Meredith	2017 – 2018 (currently a graduate student at the University of Utah)
Diana Woller	2017 – 2018 (currently a graduate student at Marquette University)
Todd Appleby	2013 – 2015 (currently a graduate student at University of Washington)
Jessica Barnes	2012 – 2013 (currently a research scientist at Virginia Tech)
Abraham Katzen	2008 – 2010 (currently a Consulting Scientist)
Shane Smith	2004 – 2005 (deceased)
Kristen Potter	2003 – 2004 (currently Coordinator, Doris Duke Conservation Scholar)
Tina Bose	2003 – 2004 (currently a graduate student at the University of Connecticut)

Undergraduate students

Martha Munoz*□, Naz Moaddab*□, Amy Herrold*, Shailja Patel*□, Dana Petrushenko*, Katherine Yao*, Carolyn Zyloney*, Julianna Dunster*, Dana Xu*, Erin Collins*, Marc Johnson, Manuel Portalatin□, Isaac Mizrahi□, Kiyanna Williams*□ (Boston University), Melissa Gulbransen*, Malorie Jahn*, Brandon Fisher, Tristan Yoder□, Akemi Nguyen*, Gabriela Piril*, Michelle Tin*, Anuhya Yalavarty*, Abhilasha KC*, Logan Klar

* female students, □ under-represented students

Ph.D and Masters Thesis Committees

Lesley Northrop, Nicolas Pierez, Mario Muscederes, Michael Caldwell, Jasmine Yang, Christine Martel, Cam Ningdong, Joel Buytkin, Ysabel Milton (Boston University), Jeremy Wilkerson, Stephen Odom, Meredith Fox, Shrinivasan Raghuraman, Rishi Alluri, Kyphun Luong, Kayla Chandler, Sasha Luks-Morgan, Jay Love, Amanda Cooper, Alicia Boynton, Ryota Inagaki, Adara Deniro, Victor Chua (Univ of Utah)

ORIGINAL PUBLICATIONS

- Jaeger EC, Vijatovic D, Nguyen A, Sweeney L, **Yamaguchi A**, Shein-Idelson M, Kelley DB, Klein H, and Toshces MA (*In preparation*) Developing viral tools to trace neural circuits and development in amphibians.
- **Yamaguchi A**, Peltier M (2023) Two conserved vocal central pattern generators broadly tuned for fast and slow rates generate species-specific vocalizations in *Xenopus* clawed frogs. *eLife*, doi: 10.7554/eLife.86299
- **Yamaguchi A** (2021) *Ex vivo* brain preparation to Analyze vocal pathways of *Xenopus* frogs. *Cold Spring Harb Protoc* doi:10.1101/pdb.prot106872

- Inagaki RT, Raghuraman S, Leavitt L, Chase K, Zornik E, Olivera B, **Yamaguchi A** (2020) Molecular characterization of frog vocal neurons using pharmacological constellation. *J Neurophysiol* 123: 2297-2310.
- Kelley DB, Ballagh IH, Barkan CL, Bendesky A, Elliott TM, Hall IC, Kwon YM, Kwong-Brown U, Leininger EC, Perez E, Rhodes, H, **Yamaguchi A**, Villain A, Zornik E (2020) Generation, coordination, and evolution of neural circuits for vocal communication. *J. Neurosci.* 40:22-36.
- **Yamaguchi A**, Woller DJ, Rodrigues P (2018) Development of an acute method to deliver transgenes into the brains of adult *Xenopus laevis*. *Front Neur Circ* doi: doi.org/10.3389/fncir.2018.00092.
- Lawton KJ, Perry WM, **Yamaguchi A**, Zornik E (2017) Motor neurons tune premotor activity in a vertebrate central pattern generator. *J Neurosci* DOI: <https://doi.org/10.1523/JNEUROSCI.2755-16.2017>
- Kelley DB, Elliott TM, Evans BJ, Hall IC, Leininger EC, Rhodes HJ, **Yamaguchi A**, Zornik E (2017) Probing forebrain to hindbrain circuit functions in *Xenopus*. *Genesis* doi:10.1002/dvg.22999
- **Yamaguchi A**, Barnes J, Appleby T (2016) Rhythm generation, coordination, and initiation in the vocal pathways of male African clawed frogs. *J Neurophysiol.* doi:10.1152/jn.00628.2016
- Zornik, E. J. and **A. Yamaguchi** (2012) Coding rate and duration in courtship vocalizations of the frog, *Xenopus laevis*. *J. Neurosci.* 32:12102–12114
- Zornik, E. J. and **A. Yamaguchi** (2011) Vocal pathway degradation in gonadectomized *Xenopus laevis* adults. *J Neurophysiol* 105:601-14.
- **Yamaguchi. A.**, Munoz, M., Bose, T. J., Smith, S. (2010) Sexual differentiation of the vocal pathways during development in *Xenopus laevis*. *Developmental Neurobiology*, 70, 862 - 874.
- Zornik, E. J. Katzen, A. W., Rhodes, H. J., and **A. Yamaguchi** (2010) NMDAR- dependent control of call duration in *Xenopus laevis*. *J Neurophysiol* 103: 3501–3515
- Yu, H. J. and **A. Yamaguchi** (2009) Endogenous serotonin initiates fictive vocalizations by activating 5-HT_{2C}-like receptors in *Xenopus laevis*. *J Neurophysiol* 103: 648–658.
- Yu, H. J., and **A. Yamaguchi** (2009) 5-HT_{2C}-like receptors in the brain of *Xenopus laevis* initiate sex-typical fictive vocalizations. *J Neurophysiol.* 102:752-765.
- **Yamaguchi A**, Herrold A, Patel S, Pong W, and Gooler D (2008) Temperature effects on vocal pattern generators in *Xenopus laevis*: implication for two independent CPGs. *Journal of Neurophys.* 100, 3134-3143.
- Rhodes, H. J., Yu, H. J., and **A. Yamaguchi** (2007) *Xenopus* vocalizations are controlled by a sexually differentiated hindbrain central pattern generator. *J Neurosci.* 27: 1485-1497.
- Potter, K. A., Bose, T. O., and **A. Yamaguchi** (2005) Androgen induced vocal transformation in adult African clawed frogs. *J Neurophysiol.* 94: 415-28
- **Yamaguchi, A.**, L. K. Kaczmarek, and D. B. Kelley (2003) Functional specialization of male and female vocal motoneurons. *J Neurosci* 23, 11568-11576.
- **Yamaguchi, A.** (2001) Sex differences in vocal learning. *Nature*, 411: 257-258.
- **Yamaguchi, A.**, L. K. Kaczmarek, and D. B. Kelley (2000) Intrinsic membrane properties of laryngeal motoneurons that control sexually differentiated vocal behavior in African clawed frogs, *Xenopus laevis*. *Biol Bull*, 199:175-6.
- **Yamaguchi, A.** and D. B. Kelley (2000) Generating sexually differentiated vocal patterns: laryngeal nerve and EMG recordings from vocalizing male and female African clawed frogs (*Xenopus laevis*). *J Neurosci*, 20: 1559-1567.
- **Yamaguchi, A.** (1999) Auditory experience does not shape sexual preferences for songs in female Northern cardinals. *Behaviour* 136:309-329.
- **Yamaguchi, A.** (1998) Can a sexually dimorphic learned birdsong be used for male- female recognition? *Behaviour* 135, 833-844.
- **Yamaguchi, A.** (1998) A sexually dimorphic learned birdsong: the Northern cardinal. *Condor* 100, 504-511.
- Okanoya*, K. and **A. Yamaguchi*** (1997) Adult Bengalese finches (*Lonchura striata var. domestica*) require real-time auditory feedback to produce normal song syntax. *J. Neurobiol.*, 33, 343-356.
- Sakaguchi, H. & **A. Yamaguchi** (1997) Early song-deprivation affects the expression of protein kinase C in the song control nuclei of the zebra finch during a sensitive period of song learning. *NeuroReport* 8, 2645-2650.

* Co-first authors.

INVITED REVIEWS

- **Yamaguchi A** (2019) “Vocal production and vocal motoneurons”. *Encyclopedia of organisms and their sounds.* Chapter 6-2. Asakura Publisher, Tokyo (*In Japanese*).
- **Yamaguchi A** (2009) Neural mechanisms of vocalizations in frogs. *Science Journal Kagaku*, 79, 802-806. (*in Japanese*)
- Zornik, E. J. and **A. Yamaguchi** (2008) Sexually differentiated central pattern generators in *Xenopus laevis*. *Trends in Neuroscience*, 31, 296-302.

- **Yamaguchi, A.** and D. B. Kelley (2003) Hormonal mechanisms of acoustic communication in animals. In: "Springer Handbook of Auditory Research: Acoustic Communication". A. M. Simmons, A. N. Popper, and R. R. Fay Eds. Springer-Verlag, New York