

Clifford E. Harpole

Curriculum Vitae



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Education

- 2009–2020 **Doctor of Philosophy, Biology**, *University of Kentucky*.
2005–2009 **Bachelor of Science, Biology**, *University of Kentucky*.

Current Position

- 2021–present **Post-doctoral researcher**, *Cold Spring Harbor Laboratory*, Advisor: Arkarup Banerjee.

Publications

- 2025 Zheng XM*, **Harpole CE***, Davis MB, Banerjee A. Parametric modulation of a shared midbrain circuit drives distinct vocal modes in a singing mouse. *bioRxiv*. <https://doi.org/pgrt>.
- 2024 Isko EC, **Harpole CE**, Zheng XM, Zhan H, Davis MB, Zador AM, Banerjee A. Selective expansion of motor cortical projections in the evolution of vocal novelty. *bioRxiv*. <https://doi.org/nv7b>.
- 2021 **Harpole CE**, Cassone VM. Context and novelty increase strength of auditory cues as a weak circadian zeitgeber in songbirds. *Chronobiology International* 38 (7): 1042-51. <https://doi.org/gk4x7n>.
- 2020 **Harpole CE**, Miles MM, and Cassone VM. Melatonin duration gates photoperiodic vocal state change in a songbird. *Journal of Pineal Research* 68 (2): 1-37. <https://doi.org/gk46qv>.
- 2017 Cassone VM, Paulose JK, **Harpole CE**. Aging and the Circadian Control of the Gastrointestinal System: From the Brain to the Gut Microbiome (and Back). In S. M. Jazwinski, V. P. Belancio, & S. M. Hill (Eds.), *Circadian Rhythms and Their Impact on Aging* (Vol. 7, pp. 83–89). Springer International Publishing. <https://doi.org/pgrv>.
Cassone VM, Paulose JK, **Harpole CE**, Li, Y, Whitfield-Rucker, M. Avian Circadian Organization. In V. Kumar (Ed.), *Biological Timekeeping: Clocks, Rhythms and Behaviour* (pp. 241–256). New Delhi: Springer India. <https://doi.org/pgrw>.
- 2014 Wang G, **Harpole CE**, Paulose JK, Cassone VM. The role of the pineal gland in the photoperiodic control of bird song frequency and repertoire in the house sparrow, *Passer domesticus*. *Horm. Behav.* <https://doi.org/f52nht>.
- 2012 Wang G, **Harpole CE**, Trivedi AK, Cassone VM. Circadian regulation of bird song, call, and locomotor behavior by pineal melatonin in the zebra finch. *J. Biol. Rhythms* 27:145–55. <https://doi.org/f3wss6>.
- 2009 Esser KA, **Harpole CE**, Prins GS, Diamond AM. Physical activity reduces prostate carcinogenesis in a transgenic model. *Prostate* 69:1372–7. <https://doi.org/fwvpf7>.

PhD Dissertation

- Title *The role of melatonin in biological rhythms of songbirds*
- Supervisor Vincent M. Cassone, PhD
- Description Melatonin's darkness-only expression profile allows it to serve as a transmitter-of-time to vertebrates on two scales: circadian and seasonal. This research explores how this is accomplished in songbirds: pineal melatonin as a potential synchronizing cue to peripheral clocks, with a marginal effect, and as a gating mechanism to seasonal expansion of vocalization, which it does perform. DOI: 10/gpg2zf

Teaching Experience

University of Kentucky Department of Biology

- 2021 **Instructor**, BIO-152 Principles of Biology & BIO-103 Basic Ideas of Biology.
taught a semester of both majors and non-majors biology in an in-person environment
- 2019-2020 **Co-instructor**, BIO-101 Careers in Math & Science, freshman research experience.
led a small classroom of freshman in a research experience
- 2015-2019 **Teaching assistant**, BIO-101 Careers in Math & Science.
- 2013-2014 **Teaching assistant**, BIO-155 Introduction to Biology Laboratory.
- 2010-2013 **Teaching assistant**, BIO-350 Animal Physiology Laboratory.
2010 **Teaching assistant**, BIO-151 Principles of Biology Laboratory.
2009 **Teaching assistant**, BIO-148 Introduction to Biology, *alternate curriculum pilot*.

Honors and Awards

- 2023 **Konishi Neuroethology Research Award**, *International Society for Neuroethology*.
- 2015 **Member**, *University of Kentucky Biology Department Neuroscience Faculty Search Committee*.
- 2013 **Member**, *University of Kentucky Biology Department Graduate Affairs Committee*.
- 2013 *University of Kentucky Department of Biology Ribble Mini-Grant*
- 2011-2012 **President**, *University of Kentucky Biology Graduate Student Association*.
- 2010-2011 **Secretary**, *University of Kentucky Biology Graduate Student Association*.

Seminar Presentations

Select Talks

- 2025 **European Birdsong Meeting**, *Neural mechanisms of vocal communication in singing mouse*.
- 2024 **Society for Behavioral Neuroendocrinology 28th Annual Meeting**, *Evolutionary diversification of vocal behavior in singing mice requires the midbrain periaqueductal gray*.
- 2018 **Society for Research on Biological Rhythms (SRBR) 16th Biennial Meeting**, *Sex differences in seasonal house sparrow vocalizations and pineal gland control*.
- 2016 **11th International Symposium on Avian Endocrinology (ISAE)**, *The effect of melatonin on circadian and seasonal rhythms of vocalizations in oscine passerine birds*.

Select Posters

- 2024 **Society for Neuroscience Annual Meeting**, *Evolutionary diversification of vocal behavior requires the midbrain periaqueductal gray*.

- 2024 **Gordon Research Conference Neural Mechanisms of Acoustic Communication**, *Evolutionary diversification of vocal behavior requires the midbrain periaqueductal gray.*
- 2023 **Society for Neuroscience Annual Meeting**, *Flexible switching between two distinct vocal modes during social interactions in singing mice.*
- 2023 **Gordon Research Conference Neuroethology**, *Neurobiology of Vocal Flexibility in Singing Mice.*
- 2016 **Society for Research on Biological Rhythms (SRBR) 15th Biennial Meeting**, *The role of melatonin in the photoperiodic control of bird song frequency and repertoire in the house sparrow, Passer domesticus.*
- 2014 **Society for Research on Biological Rhythms (SRBR) 14th Biennial Meeting**, *The role of the pineal gland in the photoperiodic control of bird song frequency and repertoire in the house sparrow.*

Interests

- Neuroethology
- Social behavior
- Circadian rhythms
- Evolution
- Vocal communication
- Seasonal rhythms