# Christine Merlin

***Curriculum vitae***
Updated 01/2026

Department of Biology
Biological Science Building East, 118C
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## Positions and Employment

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|---|---|
| 2024-present | Professor, Department of Biology, Texas A&M University |
| 2019-2024 | Associate Professor, Department of Biology, Texas A&M University |
| 2015-present | Faculty of Ecology and Evolutionary Biology, Texas A&M University |
| 2014-present | Faculty of Neuroscience, Texas A&M University |
| 2014-present | Faculty of Genetics and Genomics, Texas A&M University |
| 2013-present | Center for Biological Clocks Research, Texas A&M University, Member |
| 2013-2019 | Assistant Professor, Department of Biology, Texas A&M University |
| 2007-2013 | Postdoctoral Fellow with Steven Reppert, University of Massachusetts Chan Medical School |
| 2003-2006 | Graduate research with Emmanuelle Jacquin-Joly and Martine Maibeche, National Institute of Agronomical Research and University Pierre and Marie Curie, France |

## Education

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| 2003-2006 | Ph.D., Insect Physiology, University Paris 6 Pierre and Marie Curie, France |
| 2002-2003 | M.S., Invertebrate Physiology, University Paris 6 Pierre and Marie Curie, France |
| 1998-2002 | B.S., Animal Biology, University Paris 6 Pierre and Marie Curie, France |

## Honors and Awards

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|---|---|
| 2021 | Konopka Research Innovation Award, Texas Society for Circadian Biology and Medicine |
| 2020 | Presidential Impact Fellow, Texas A&M University |
| 2018 | Junior Faculty Research Award, International Society for Research on Biological Rhythms |
| 2017-2020 | Klingenstein-Simons Fellowship Award in Neuroscience |
| 2011-2013 | Charles King Trust Postdoctoral Fellowship, The Medical Foundation |
| 2003-2006 | Graduate fellowship, French National Institute of Agronomical Research |
| 2002-2003 | Fellowship, French Ministry of National Education |

## Professional activities

Boards/Advisory Committees

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|---|---|
| 2025-2030 | Steering Committee, Wellcome Trust Magnetoreception Consortium, Member |
| 2024-2026 | Board of Directors, International Society for Research on Biological Rhythms, Comptroller, *ex-officio* |
| 2022-2024 | Board of Directors, International Society for Research on Biological Rhythms, Treasurer |
| 2020-2022 | Board of Directors, International Society for Research on Biological Rhythms, Member-at-Large |

Memberships

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|---|---|
| 2022-present | American Association for the Advancement of Science, Member |
| 2014- present | International Society for Research on Biological Rhythms, Member |
| 2016-2019 | Genetics Society of America, Member |
| 2014-2019 | NSF Insect Genetic Technology Network, Member |

Editorial activities

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|---|---|
| 2023-2028 | Editorial Board, Journal of Biological Rhythms |
| 2022-2023 | Guest Editor, Special Issue on Monarch Butterflies, Current Opinion in Insect Science |
| 2013-present | Review Editor, Frontiers in Ecology and Evolutionary Biology, Chemical Ecology |
| 2009-2013 | Associate member of Faculty of 1000 Biology |

Reviewer activities

*Grants*

2025 Human Frontiers Science Program, *Ad hoc*
2025 National Science Foundation, Integrative Organismal Systems, *Ad hoc*
2024 National Science Foundation, EPSCoR program, *Ad hoc*
2023 Natural Sciences and Engineering Research Council of Canada, *Ad hoc*
2022 National Science Foundation, Integrative Organismal Systems, *Panelist*
2022 Israel Science Foundation, *Ad hoc*
2019 National Science Foundation, Integrative Organismal Systems, *Ad hoc*
2018 National Science Foundation, Integrative Organismal Systems, *Ad hoc*
2017 National Science Foundation, Integrative Organismal Systems, *Ad hoc*
2015 National Science Foundation, Integrative Organismal Systems, *Ad hoc*
2015 National Science Foundation, Integrative Organismal Systems, *Panelist*

*Manuscripts* Animal Behavior, Behavior Genetics, Biological Journal of the Linnean Society, Cell, Cell Reports, Communications Biology, Current Biology, eLife, European Journal of Neuroscience, Frontiers in Behavioral Neuroscience, Frontiers in Ecology and Evolutionary Biology, Frontiers in Physiology, Gene Technology, Heredity, Insect Molecular Biology, iScience, Journal of Biological Rhythms, Journal of Experimental Biology, Journal of Insect Science, Journal of the Lepidopterists' Society, Journal of the Royal Society Interface, Molecular Ecology, Nature, PloS Genetics, Proceedings of the Royal Society B, Proceedings of the National Academy of Sciences, PloS One, Scientific Reports, Science.

*Awards*
2022 International Society for Research on Biological rhythms meeting, Trainee Merit Awards
2018 International Society for Research on Biological rhythms meeting, Trainee Merit Awards

Conference organization (*: Ongoing/**Upcoming commitment)
2027-2029** Co-Chair, Gordon Research Conference Quantum Biology
2025-2027* Vice Co-Chair, Gordon Research Conference Quantum Biology
2025-2026* Fundraising Committee Member, 2026 International Society for Research on Biological Rhythms meeting
2024-2026* Program Chair, 2026 International Society for Research on Biological Rhythms meeting
2022 Panel Chair, "Navigating an Ever-Changing Funding Environment" workshop, International Society for Research on Biological Rhythms meeting
2020 Symposium Chair, International Society for Research on Biological Rhythms meeting
2019-2020 Program Committee Member, 2020 International Society for Research on Biological Rhythms
2019 Co-organizer, Texas Society for Circadian Biology and Medicine meeting
2018 Session Chair, Trainee Development Day, International Society for Research on Biological Rhythms
2016 Co-organizer, Texas Society for Circadian Biology and Medicine meeting
2014 Session Chair, International Society for Research on Biological Rhythms meeting
2014 Workshop co-organizer, Trainee Development Day, Society for Research on Biological Rhythms

Panels
2024 International Society for Research on Biological Rhythms Meeting, 'Outside the box, debate dialogue' panel, Trainee Day (San Juan, PR)
2024 International Society for Research on Biological Rhythms Meeting, 'The Circadian Oscillator: Is There More to Discover?' panel (San Juan, PR)
2022 The Kavli Foundation, Neurobiology and Changing Ecosystems (Los Angeles, CA)

Consultant
2015 Book on Monarch butterflies in a series on Bioindicator animals (Red Line Amiral)

## Invited Presentations and Seminars (*: Upcoming commitment)
2026* 12th Animal Navigation International Conference, Royal Institute of Navigation (London, UK)
2025 Texas Society for Circadian Biology and Medicine (Dallas, TX)
2025 International Monarch Science Symposium (Lawrence, KS)
2025 Gordon Research Conference Movement Ecology of Animals (Ventura, CA)
2025 Gordon Research Conference Chronobiology (Barcelona, Spain)
2025 Dutch BioClock Academy (Virtual Seminar)
2025 Neurobiology in Changing Environments Symposium (Allen Institute, Seattle, WA)

2025 Gordon Research Conference Quantum Biology (Lucca, Italy)
2024 Johannes Gutenberg University, Gene regulation in Evolution Network (Mainz, Germany), *Invited by Graduate Students*
2024 Yale School of Medicine, Department of Cellular and Molecular Physiology (New Haven, CT)
2024 Norwegian University of Science and Technology, Department of Biology (Trondheim, Norway)
2024 Lund University, Department of Biology (Lund, Sweden)
2023 Klingenstein-Simons Meeting, Simons Foundation (New York, NY)
2023 Hope Center Clocks and Sleep Club, Washington University in St Louis (Virtual seminar)
2022 Texas Society for Circadian Biology and Medicine (Houston, TX)
2022 UMass Chan Medical School, Department of Neurobiology (Worcester, MA)
2022 International Seminar Series on Lepidoptera, Lepinar (Virtual seminar)
2022 University of Colorado Boulder, Department of Integrative Physiology (Boulder, CO)
2022 International Seminar Series ZooNav, Animal navigation and orientation (Virtual Seminar)
2022 11th International Workshop on the Molecular Biology and Genetics of the Lepidoptera, *Keynote Lecture* (Kolympari, Crete)
2022 International Congress of Neuroethology, *Presidential Symposium* (Lisbon, Portugal)
2022 Gordon Research Conference Photosensory Receptors and Signal Transduction (Ventura, CA)
2021 University of Washington, Neuroscience Graduate Program (Virtual Seminar)
2021 SFB 1372 Magnetoreception and Navigation in Vertebrates Symposium (Virtual Conference)
2021 International Behavioural and Neural Genetics Society, Genes, Brain and Behavior, Emergent systems for genetic studies of behavior Symposium (Virtual Conference)
2021 CINCHRON European Network Seminar series (Virtual Seminar)
2020 Argentinian Society for Research in Neuroscience (Virtual Conference)
2019 Molecular Biosystems Conference on Eukaryotic Gene Regulation and Functional Genomics (Puerto Varas, Chile)
2019 Texas A&M University, Department of Entomology (College Station, TX)
2019 International Congress of Comparative Physiology and Biochemistry, Invertebrate photoperiodism and seasonality Symposium (Ottawa, Canada)
2019 Gordon Research Conference Chronobiology (Barcelona, Spain)
2019 Texas Society for Circadian Biology and Medicine (College Station, TX)
2018 Journal of Experimental Biology 2018 Symposium, Linking brain and behavior in animal navigation (Cavo Olympo, Greece)
2017 8th Max Planck Institute-Chinese Academy of Sciences Exploratory Round Table Conference on Mechanisms of Animal Behavior (Shanghai, China)
2017 University of Missouri, Division of Biological Sciences, *Invited by Graduate Students*
2017 UC Davis, Department of Entomology and Nematology
2017 Texas Genetics Society meeting (College Station, TX)
2017 Genetics of Migration Symposium (Plön, Germany)
2017 Center for Circadian Biology Symposium (UC San Diego, CA)
2016 Texas A&M University, Department of Entomology, *Invited by Graduate Students*
2016 International Congress of Entomology, Evolution of biological clocks Symposium (Orlando, FL)
2016 Virginia Tech University, Department of Biological Sciences
2016 Society for Research on Biological Rhythms (Tampa, FL)
2016 Texas A&M University, Department of Horticultural Sciences
2015 Texas A&M University, Interdisciplinary Program in Genetics
2015 Insect Genetic Technology Research Coordination Network, Special symposium on Flies, Monarchs, Mosquitoes: Insights using genetic technologies (Rockville, MD)
2015 Insect Genetic Technology Workshop, Annual Arthropod Genomics Consortium Symposium (Manhattan, KS)
2014 Baylor University, Department of Biology
2014 APS Intersociety Meeting: Comparative Approaches to Grand Challenges in Physiology (San Diego, CA)
2014 Texas A&M University, Zoology Society
2014 Southeastern and Central Texas Society for Clocks Meeting (Houston, TX)
2013 Texas A&M University, Genetic Graduate Student Association
2013 EFOR network, Genomics and Lepidoptera (Paris, France)
2013 Behavioural Ecology of Animal Movement, Post-congress Symposium of the 14th International Behavioral Ecology Congress (Lund, Sweden)
2010 Society for Research on Biological Rhythms (Sandestin, FL)

2009 Hot topic symposium of the XI Congress of the European Biological Rhythms Society (Strasbourg, France; selected on abstract)

## Publications *(⁺: Postdoctoral Associate; *: Graduate student; **: Undergraduate student)*

***In preparation***

1. Lugena AB*, Goforth KM⁺, Ying Zhang⁺, Vinaya Shetty⁺, Gonzalez A, Ramirez I, **Merlin C**. Seasonal blood-brain barrier plasticity links environmental cues to migratory behavior in monarch butterflies.
2. Goforth KM⁺, Shetty V⁺, Gianuzzi M, **Merlin C**. Monarch butterfly long-distance migration in changing environments. *Invited review*, *Current Opinion in Neurobiology*.
3. Greenwell BJ, Beytebiere JR, Lamb TM, Bell-Pedersen D, **Merlin C** and Menet JS. Isoform-specific regulation of rhythmic gene expression by alternative polyadenylation.

***Submitted***

1. Tong CY, Li C, Hurni C, Jacq A, Nie X, Guy C, Suh JH, Wong RKW, **Merlin C**, Naef F, Menet J, Jiang Y. Single-Cell Multiomic Analysis of Circadian Rhythmicity in Mouse Liver. *BioRxiv,* DOI: https://doi.org/10.1101/2025.04.03.647044.
2. Termignoni-Garcia F, **Merlin C**, Menet JS, Goubert C, Delmore KE. Genome shock in a migratory songbird hybrid zone.

***Peer-Reviewed Publications***

26. Zhang Y⁺, Hardin PE, **Merlin C**. TRITHORAX and HSP68 regulate clock gene transcription in the *Drosophila* transcriptional feedback loop. *Journal of Biological Rhythms*, 2025, DOI: 10.1177/07487304251386708.
25. Iiams SE*, Wan G⁺, Zhang J, Lugena AB*, Zhang Y⁺, Hayden AN**, **Merlin C**. Loss of functional Cryptochrome 1 reduces robustness of 24-hour behavioral rhythms in monarch butterflies. *iScience*, 2024, 27(2):108980. DOI: 10.1016/j.isci.2024.108980
24. Nguyen TAT, Beetz J, **Merlin C**, Pfeiffer K, el Jundi B. Weighting of celestial and terrestrial cues in the monarch butterfly central complex. *Frontiers in Neural Circuits*, 2022, 16:862279. DOI: 10.3389/fncir.2022.862279
23. Shetty V, Meyers JI, Zhang Y⁺, **Merlin C**, Slotman MA. Impact of disabled circadian clock on yellow fever mosquito *Aedes aegypti* fitness and behaviors. *Scientific Reports*, 2022, 12:6899. DOI: 10.1038/s41598-022-10825-5
22. Zhang Y⁺, Iiams SE*, Menet JS, Hardin PE and **Merlin C**. TRITHORAX-dependent arginine methylation of HSP68 mediates circadian repression by PERIOD. *Proceedings of the National Academy of Sciences USA,* 2022, 119(4):e2115711119. DOI: 10.1073/pnas.2115711119
21. Beetz J, Kraus C, Franzke M, Dreyer D, Strube-Bloss M, Roessler W, Warrant E, **Merlin C** and El Jundi B. Flight-induced compass representation in the monarch butterfly heading network. *Current Biology*, 2022, 32(2):338-349.e5. DOI: 10.1016/j.cub.2021.11.009
20. Rivas GBS, Zhou J, **Merlin C** and Hardin PE. CLOCKWORK ORANGE promotes CLOCK-CYCLE activation via the Drosophila ortholog of CLOCK INTERACING PROTEIN, CIRCADIAN. *Current Biology*, 2021, 31(19):4207-4218.e4. DOI: 10.1016/j.cub.2021.07.017
19. Nguyen TAT, Beetz J, **Merlin C** and El Jundi B. Sun compass neurons are tuned to migratory orientation in monarch butterflies. *Proceedings of the Royal Society B*, 2021, 288: 20202988. DOI: 10.1098/rspb.2020.2988
18. Wan G⁺, Hayden AN**, Iiams SE* and **Merlin C**. Cryptochrome 1 mediates light-dependent inclination magnetosensing in monarch butterflies. *Nature Communications*, 2021, 12: 771. DOI: 10.1038/s41467-021-21002-z
17. Iiams SE*, Lugena AB*, Zhang Y⁺, Hayden AN** and **Merlin C**. Photoperiodic and clock regulation of the vitamin A pathway in the brain mediates seasonal responsiveness in the monarch butterfly. *Proceedings of the National Academy of Sciences USA*, 2019, 116(50): 25214-25221. DOI: 10.1073/pnas.1913915116

16. Lugena AB*, Zhang Y+, Menet JS and **Merlin C**. Genome-wide discovery of the daily transcriptome, *cis*-regulatory elements and transcription factor footprints in the monarch butterfly brain. *PLoS Genetics*, 2019, 15(7): e1008265. DOI: 10.1371/journal.pgen.1008265

15. Zhang Y+, Markert MJ*, Groves SC**, Hardin PE and **Merlin C**. Vertebrate-like CRYPTOCHROME 2 from monarch regulates circadian transcription via independent mechanisms on CLOCK and BMAL1. *Proceedings of the National Academy of Sciences USA*, 2017, 114(36): E7516-E7525. DOI: 10.1073/pnas.1702014114

14. Markert MJ*, Zhang Y+, Enuameh MS, Reppert SM, Wolfe SA and **Merlin C**. Genomic access to monarch migration using TALEN and CRISPR/Cas9-mediated targeted mutagenesis. *G3: Genes, Genomes, Genetics*, 2016, 6:905-15. DOI: 10.1534/g3.116.027029

13. **Merlin C**, Beaver LE, Taylor OR, Wolfe SA and Reppert SM. Efficient targeted mutagenesis in the monarch butterfly using Zinc Finger Nucleases. *Genome Research*, 2013, 23:159-68. DOI: 10.1101/gr.145599.112

12. Guerra PA, **Merlin C**, Gegear RJ and Reppert SM. Discordant timing between antennae disrupts sun compass orientation in migratory monarch butterflies. *Nature Communications*, 2012, 3:958. DOI: 10.1038/ncomms1965

11. Zhan S, **Merlin C**, Boore JL and Reppert SM. The monarch butterfly genome yields insights into long-distance migration. *Cell*, 2011, 147: 1171-1185. DOI: 10.1016/j.cell.2011.09.052

10. Legeai F, Malpel S, Montagné N, Monsempes C, Cousseran F, **Merlin C**, François M-C, Maïbèche-Coisne M, Gavory F, Poulain J and Jacquin-Joly E. An Expressed Sequence Tag collection from the male antennae of the Noctuid moth *Spodoptera littoralis*: a resource for olfactory and pheromone detection research. *BMC Genomics*, 2011, 12: 86. DOI: 10.1186/1471-2164-12-86

9. **Merlin C**, Gegear RJ and Reppert SM. Antennal circadian clocks coordinate sun compass orientation in migratory monarch butterflies. *Science*, 2009, 325: 1700-1704. DOI: 10.1126/science.1176221

8. Malpel S, **Merlin C**, François M-C and Jacquin-Joly E. Molecular identification and characterization of two new Lepidoptera chemoreceptors belonging to the *Drosophila* OR83b family. *Insect Molecular Biology*, 2008,17: 587-596. DOI: 10.1111/j.1365-2583.2008.00830.x

7. **Merlin C**, Lucas P, Rochat D, François M-C, Maïbèche-Coisne M and Jacquin-Joly E. An antennal circadian clock and circadian rhythms in the peripheral pheromone reception in the moth *Spodoptera littoralis*. *Journal of Biological Rhythms*, 2007, 22: 502-514. DOI: 10.1177/0748730407307737

6. **Merlin C**, Rosell G, Carot-Sans G, François M-C, Bozzolan F, Pelletier J, Jacquin-Joly E, Guerrero A and Maïbèche-Coisne M. Antennal esterase cDNAs from two pest moths, *Spodoptera littoralis* and *Sesamia nonagrioides*, potentially involved in odourant degradation. *Insect Molecular Biology*, 2007, 16: 73-81. DOI: 10.1111/j.1365-2583.2006.00702.x

5. De Santis F, François M-C, **Merlin C**, Pelletier J, Maïbèche-Coisne M, Conti E and Jacquin-Joly E. Molecular cloning and *in situ* expression patterns of two new pheromone-binding proteins from the corn stemborer *Sesamia nonagrioides*. *Journal of Chemical Ecology*, 2006, 32: 1703-1717. DOI: 10.1007/s10886-006-9103-2

4. **Merlin C**, François M-C, Queguiner I, Maïbèche-Coisne M and Jacquin-Joly E. Evidence for a putative antennal clock in *Mamestra brassicae*: molecular cloning and characterization of two clock genes-*period* and *cryptochrome*- in antennae. *Insect Molecular Biology*, 2006, 15: 137-145. DOI: 10.1111/j.1365-2583.2006.00617.x

3. **Merlin C**, François M-C, Bozzolan F, Pelletier J, Jacquin-Joly E and Maïbèche-Coisne M. A new aldehyde oxidase selectively expressed in chemosensory organs of insects. *Biochemical and Biophysical Research Communications*, 2005, 332: 4-10. DOI: 10.1016/j.bbrc.2005.04.084

2. Maïbèche-Coisne M, **Merlin C**, François M-C, Porcheron P and Jacquin-Joly E. P450 and P450 reductase cDNAs from the moth *Mamestra brassicae*: cloning and expression patterns in male antennae. *Gene*, 2005, 346: 195-203. DOI: 10.1016/j.gene.2004.11.010

1. Maïbèche-Coisne M, **Merlin C**, François M-C, Queguiner I, Porcheron P and Jacquin-Joly E. Putative odorant-degrading esterase cDNA from the moth *Mamestra brassicae*: cloning and expression patterns in male and female antennae. *Chemical Senses*, 2004, 29: 381-390. DOI: 10.1093/chemse/bjh039

***Other***

***Peer-reviewed Review Articles*** *(+: Postdoctoral Associate; *: Graduate student; **: Undergraduate student)*

9. Goforth KM[+], **Merlin C**. From skylight cues to magnetic fields: The toolkit of insect long-distance migration. *Journal of Comparative Physiology A*, 2025, DOI: 10.1007/s00359-025-01770-5.

8. **Merlin C**. Insect magnetoreception: a Cry for mechanistic insights. J Comp Physiol A Neuroethol Sens Neural Behav Physiol, 2023, 209: 785–792. DOI: 10.1007/s00359-023-01636-8

7. **Merlin C**, Iiams SE* and Lugena AB*. Monarch butterfly migration moving into the genetic era. *Trends in Genetics*, 2020, 36(9): 689-701. DOI: 10.1016/j.tig.2020.06.011

6. **Merlin C** and Liedvogel M. The genetics and epigenetics of animal migration and orientation: birds, butterflies, and beyond. *Journal of Experimental Biology*, 2019, 222, jeb191890. DOI: 10.1242/jeb.191890

5. Denlinger DL, Hahn DA, **Merlin C**, Holzapfel CM, and Bradshaw WE. Keeping time without a spine: what can the insect clock teach us about seasonal adaptation? *Philosophical Transactions of the Royal Society B*, 2017, 372:1734. DOI: 10.1098/rstb.2016.0257

4. Reppert SM, Guerra PA and **Merlin C**. Neurobiology of Monarch Butterfly Migration. *Annual Reviews of Entomology*, 2016, 61:25-42. DOI: 10.1146/annurev-ento-010814-020855

3. **Merlin C**, Heinze S and Reppert SM. Unraveling navigational strategies in migratory insects. *Current Opinion in Neurobiol*ogy, 2012, 22:353-61. DOI: 10.1016/j.conb.2011.11.009

2. Reppert SM, Gegear RJ and **Merlin C**. Navigational mechanisms of migrating monarch butterflies. *Trends in Neurosciences*, 2010, 33: 399-406. DOI: 10.1016/j.tins.2010.04.004

1. Jacquin-Joly E and **Merlin C**. Insect olfactory receptors: contributions of molecular biology to chemical ecology. *Journal of Chemical Ecol*ogy, 2004, 30: 2359-97. DOI: 10.1007/s10886-004-7941-3

***News and views/Editorials***

2. **Merlin C** and Oberhauser K. Editorial Overview: Spotlight on monarch butterflies: A treasure trove of biology to preserve. *Current Opinion in Insect Science*, 2023, 60: 101152. DOI: 10.1016/j.cois.2023.101152

1. **Merlin C**. Biological Timing: The crustacean *Parhyale* is rolling with the tides. *Current Biology*, 2023, 33: R398–R423. DOI: 10.1016/j.cub.2023.04.023

***Symposium-derived Articles***

2. Anttonen T, Burghi T, Duvall L, P. Fernandez M, Gutierrez G, Kermen F, **Merlin C** and Michaiel A. Neurobiology and Changing Ecosystems: Mechanisms Underlying Responses to Human-generated Environmental Impacts. *Journal of Neuroscience,* 2023, 43: 7530-7537. DOI: 10.1523/JNEUROSCI.1431-23.2023

1. Bradley TJ, Briscoe AD, Brady SG, Cardinal S, Contreras HL, Danforth N, Dudley R, Grimaldi D, Harrison JF, Kaiser A, **Merlin C**, Reppert SM, Vanderbrooks JM and Yanoviak SP. Episodes in Insect Evolution. *Integrative and Comparative Biology*, 2009, 49: 590-606. DOI: 10.1093/icb/icp043

***Book chapters***

2. **Merlin C**, Gegear RJ and Reppert SM. Monarch butterfly migration. In, McGraw-Hill Yearbook of Science and Technology, 2011, pp 212-214.

1. **Merlin C** and Reppert SM. Lepidopteran circadian clocks: from molecules to behavior. In, Molecular Biology and Genetics of the Lepidoptera, Goldsmith M.R. and Marec, F.(Eds), Taylor & Francis, Boca Raton, FL, chap. 8, 2009, pp 137-152.

## Teaching and Mentoring

### ***Courses taught***

TAMU BIOL 609: Molecular Tools in Biology (2014-present; yearly)

Graduate course that focuses on modern tools and methods used in prokaryotic and eukaryotic molecular biology. Students learn to choose the appropriate experimental technique for a given scientific question and to design and interpret experiments. (Co-Instructor with Dr. Menet Jerome, 50% effort; enrollment ~50 students/year)

TAMU BIOL 214: Genes, Ecology and Evolution (2016-present; yearly)

Undergraduate sophomore-level course that provides a genetically-based introduction to the study of ecology and evolution with an emphasis on the interactions of organisms with each other and with their environment. (100% effort; enrollment ~110 students/year)

## ***Research Personnel Advised***

### Current Trainees

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|---|---|
| Dr. Ying Zhang | Postdoctoral Research Associate |
| Dr. Kayla Goforth | Welch Postdoctoral Fellow of the Life Sciences Research Foundation |
| Dr. Vinaya Shetty | Postdoctoral Research Associate |
| Bradley Billig | Graduate Student |
| Michael Gianuzzi | Research Technician |
| Jarno Capuchino | Undergraduate researcher, Honors Biology |
| Audrey Middleton | Undergraduate researcher, Biology |
| Rachel Smith | Undergraduate researcher, Microbiology |
| Avery Carrejo | Student worker |
| Joshua Glanz | Student worker |
| Patricia Mendez | Student worker |

### Former Postdoctoral Fellows

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|---|---|
| Dr. Guijun Wan | Postdoctoral Research Associate, 2017-2020<br>Current position: Associate Professor, Department of Entomology, Nanjing Agricultural University, China |
| Dr. Flavia Termignoni | Postdoctoral Research Associate, 2025<br>Current position: Postdoctoral Research Associate, University of Padova, Italy |

### Former Graduate Students

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|---|---|
| Dr. Samantha Iiams | Interdisciplinary Program of Genetics PhD student, 2015-2021<br>Current position: Postdoctoral Research Associate, Department of Neurosciences, UT Southwestern Medical School, Joseph Takahashi's lab. |
| Dr. Aldrin Lugena | Biology Ph.D student, 2016-2022<br>Current position: Scientist/Next-Generation Sequencing Team Leader, Avance Biosciences, Houston, TX. |

### Former Visiting Scholars

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| Dr. Alok Arun | Assistant Professor, Institute of Sustainable Biotechnology, Inter American University of Puerto Rico |
| Dr. Guijun Wan | Postdoctoral Researcher, Department of Entomology, Nanjing Agricultural University, Nanjing, China |
| Dr. Basil el Jundi | Emmy Noether group leader, Biocenter, University of Würzburg, Germany |
| Dr. Jerome Beetz | Postdoctoral researcher, el Jundi's group, University of Würzburg, Germany |
| Dr. Robin Grob | Marie Sklodowska-Curie Actions Postdoctoral, el Jundi's group, NTNU Norway |
| Milan Becker | Master's student, el Jundi's group, Biocenter, University of Würzburg, Germany |
| Mingqi Cai | Master's student, East Normal China University, Shanghai, China |
| Myriam Franzke | Graduate student, el Jundi's group, Biocenter, University of Würzburg, Germany |
| Tu Anh Nguyen Thi | Graduate student, el Jundi's group, Biocenter, University of Würzburg, Germany |
| Christian Kraus | Graduate student, el Jundi's group, NTNU Norway |
| Fredrik Hanslin | Graduate student, el Jundi's group, NTNU Norway |
| Daniele Tacchio | Master's student, el Jundi's group, NTNU Norway |

### Former Undergraduate Students

Abigail Adkins: 2022-2023; Biochemistry and Biophysics
Alyssa Bennett: 2019; Biology
Catherine Bogdan: 2017-19; Genetics
Kendall Bowen: 2015-17; Genetics
Jenna Coleman: 2019-2020; Biology
Mandy Eckhardt: 2019; Genetics REU
Anushka Ganoo: 2023-2024; Biomedical Sciences
Melanie Goodman: 2014-15; Biology
Shayna Groves: 2014-15; Biology
Corine Harvey: 2023; Biology
Emily McKnight: 2013-14; Biology
Candice Medina: 2015; Biology
Kimberly Morrison: 2018; Biology
An Nguyen: 2023-2024; student worker
Lauren Nowlin: 2016; Biology
Jason Park: 2017-18; Biology
Julia Peralta: 2021; Biology
Lauren Pitts: 2021-2024; Neuroscience
Abbas Poonawala: 2024; Biology
Haleigh Jo Shoemake: 2022; Biology

Ashley Hayden: 2017-19; Honors Biology
Karen Ibarra: 2024; Biology
Sarah Kenny: 2015-17; Biology
Anna Subonj: 2018-19; Biology
Justin Vann: 2014; Biology
Adil Khan: 2025, Biology

Honors and Awards won by advised trainees

2025

*Dr. Kayla Goforth*. Selected as participant and recipient of a Travel Scholarship, Janelia Genetic Tools for New Model Organisms Conference (Lodging, meals and airfare covered by HHMI; Mar 16-19, 2025); nominated by Texas A&M to apply for participation to the 2026 75th Lindau Nobel Laureate meeting.

2024

*Dr. Ying Zhang*. First Place Poster presentation at the Texas Society for Circadian Biology and Medicine meeting.
*Dr. Kayla Goforth*. Life Sciences Research Foundation Postdoctoral Fellowship ($291,000 over 3 years supported by the Welch Foundation; 08/01/2024-07/31/2027).
*Dr. Kayla Goforth*. National Science Foundation Postdoctoral Research Fellowship in Biology (*Declined*).

2021

*Aldrin Lugena*. Aggieland RNA Research Award.
*Aldrin Lugena*. Annual TAMU Department of Biology Student/Postdoc Research Conference, Best Talk award.

2020

*Dr. Guijun Wan*. International Society for Research on Biological Rhythms Wellcome Burrough Fund Excellence Award.
*Aldrin Lugena*. International Society for Research on Biological Rhythms Trainee Merit Award.
*Aldrin Lugena*. Roozbeh Arianpour Memorial Scholarship. Awarded for excellence in research in biology at Texas A&M University, Department of Biology.
*Aldrin Lugena*. Annual Texas A&M Department of Biology Student/Postdoc Research Conference, Second Place Poster award.

2019

*Dr. Guijun Wan*. First Place Poster competition at the Texas Society for Circadian Biology and Medicine meeting.
*Dr.* Ying Zhang. Annual TAMU Department of Biology Student/Postdoc Research Conference, Best Postdoc Poster award.
*Samantha Iiams*. First Place Poster competition at theTexas A&M Genetics Symposium.
*Samantha Iiams*. First Place Poster competition at the Texas A&M Genome Editing Symposium.
*Ashley Hayden*. Texas A&M Biology Distinguished Undergraduate Award.

2018

*Samantha Iiams*. International Society for Research on Biological Rhythms Patricia DeCoursey Excellence Award.
*Aldrin Lugena*. International Society for Research on Biological Rhythms Trainee Merit Award.
*Samantha Iiams*. Second place talk and People's Choice award at the Texas A&M Genetics Symposium.
*Samantha Iiams*. Poster prize at the Texas Society for Circadian Biology and Medicine meeting.
*Samantha Iiams*. Texas A&M Genetics Program Travel Award.
*Aldrin Lugena*. Texas A&M Department of Biology Travel Award.
*Ashley Hayden.* Astronaut Scholarship.

2017

*Samantha Iiams*. Annual Texas A&M Department of Biology Student/Postdoc Research Conference, Best poster prize in the junior category.
*Kendall Bowen*. Annual Texas A&M Department of Biology graduation reception, Poster prize.
*Sarah Kenny*. Annual Texas A&M Department of Biology graduation reception, Poster prize.

2016

*Samantha Iiams*. Texas A&M Genetics Outstanding Performance in Teaching Award.

## ***Graduate Student Committee member***

| | | | |
|---|---|---|---|
| 2025-present | Sydney Christensen, Genetics | 2020-2025 | Xinyu Nie, Biology |
| 2024-present | Fredrik Hanslin, NTNU, Norway | 2021-2023 | Samuel Park, Biology |
| 2024-present | Samantha Swech, Neuroscience | 2018-2023 | Kushal Bakshi, Neuroscience |
| 2024-present | Nolan Ditterhauser, Biology | 2018-2020 | Tammy Oh, Biology |
| 2024-present | Chieh-Wen Ho, Biology | 2017-2023 | Amy Tan, Biology |

| | | | |
|---|---|---|---|
| 2024-present | Farina Mohammadpourmir, Biology | 2016-2020 | Ashley Tessnow, Entomology |
| 2024-present | Chun Yip Tong, Biology | 2015-2020 | Zachary Popkin-Hall, Entomology |
| 2023-present | Jiawen Zhang, Cellular and Molecular Physiology, Yale | 2015-2019 | Joshua Beytebiere, Biology |
| | | 2016-2019 | Justin Overcash, Genetics |
| 2022-present | Andie Miller, Ecology and Evolutionary Biology | 2014-2019 | Michael Werry, Biology |
| | | 2018-2019 | James Kutlowski, Biology |
| 2022-present | Chante Guy, Biology | 2015-2018 | Andrew Sakla, Biology |
| 2022-present | Cara Webster, Biology | 2016-2018 | Miguel Gonzales, Genetics |
| 2020-present | Griffin Best, Biology | 2016-2018 | Melanie DeSessa, Chemical Engineering |
| 2018-present | Jorden Holland, Genetics | | |
| 2018-2024 | Whitney Robertson, Biology | 2015-2017 | Courtney Caster, Genetics |
| 2020-2024 | Ebi Preh, Biology | 2014-2017 | Tianxin Liu, Biology |

***Junior Faculty Mentoring***

| | |
|---|---|
| 2024-present | Dr. Marie Strader, Assistant Professor Texas A&M Biology |
| 2021-present | Dr. Jeff Jones, Assistant Professor Texas A&M Biology |
| 2018-2025 | Dr. Kira Delmore, Associate Professor Texas A&M Biology (currently at Columbia University) |

## Funding

Current

**Human Frontier Science Program**
(PI: I. Shapiro; Co-PIs: C. Merlin, H. Kato, M. Kosloff) 9/1/2024-8/31/2027
Title: Ultraviolet opsin as the sensor for magnetosensation in animals
Total award amount: $1,500,000
The objective of this project is to elucidate the unexplored role of ultraviolet opsins in magnetic sensing using quantum chemical simulations, 3D protein structure modeling, bioinformatics, cryo-electron microscopy and behavioral neurogenetics, through a synergistic and international collaboration.

**Life Sciences Research Foundation/Welch Foundation**
(PI: Kayla Goforth; Postdoc Mentor: C. Merlin) 8/1/2024-7/31/2027
Title: Shedding light on the mechanisms underlying animal magnetoreception
Total award amount: $291,000
The objective of this project is to investigate the molecular components and downstream signaling pathways of magnetoreception in monarch butterflies with a focus on a UV opsin and the C-terminal domain of Cryptochrome.

**NIH R01 GM124617**
(PI: C. Merlin, MPI: P. Hardin) 4/1/2023-3/31/2027
Title: Mechanisms of circadian repression
Total award amount: $1,450,545
The objective of this project is to use the monarch butterfly and Drosophila as two complementary models to determine 1) how CIPC binding to CLK e19r regulates transcriptional repression of CLOCK-BMAL1 and CLOCK-CYCLE transcription, and 2) which HSP70/HSP40 family members mediate PER-CLK binding and transcriptional repression and whether they drive phosphorylation-dependent conformational changes in PER and CLK.

**NSF IOS 2224154**
(PI: C. Merlin) 10/1/2022-9/30/2026
Title: Clock-controlled vitamin A regulation of animal photoperiodic responsiveness
Total award amount: $900,000
The objective of this project is to determine the role of vitamin A in photoperiodic responsiveness in the monarch brain by testing whether it functions in the production of an opsin-based deep brain photoreceptor for photoperiodic induction and/or the reprogramming of gene expression in a photoperiod-dependent manner to rewire the neuronal circuitry in the brain in response to changing seasons.

Completed

**TAMU Presidential Impact Fellowship**
(PI: C. Merlin) 2020-2023
Total award amount: $75,000

**NSF IOS 1754725**

(PI: C. Merlin) 6/1/2018-5/30/2023
Title: Epigenetic regulation of seasonal behavior in insects
Total award amount: $600,000
The objective of this project is to delineate the epigenetic architecture that underlies differential gene expression in the monarch brain responsible for migratory behavior and the production of distinct seasonal flight orientations by identifying open chromatin regions, cis-regulatory elements and transcription factors that mediate differential gene expression between non-migrants, fall migrants and spring remigrants.

**NIH R01 GM124617 S1 Administrative Supplement**
(PI: C. Merlin, MPI: P. Hardin) 8/01/2020-7/31/2021
Title: Mechanisms of circadian repression
Total award amount: $66,696 (supplemented with $22,250 from TAMU as 25% cost sharing)

**NIH R01 GM124617**
(PI: C. Merlin, MPI: P. Hardin) 8/11/2017-8/10/2022
Title: Mechanisms of circadian repression
Total award amount: $1,157,576
The objective of this project is to determine 1) how PERIOD initiates on-DNA repression of CLOCK-BMAL1 and CLOCK-CYCLE transcription, and 2) how PERIOD and CLOCKWORKORANGE collaborate to maintain off-DNA transcriptional repression and promote CLOCK-CYCLE/CLOCK-BMAL1 transcription, using the monarch butterfly and *Drosophila* as two complementary models.

**Klingenstein-Simons Award in Neuroscience**
(PI: C. Merlin) 7/1/2017-6/30/2022
Title: Defining clock neuronal circuits that control seasonal behavior
Total award amount: $225,000
The objective of this project is to develop CRISPR/Cas9-assisted knock-in approaches in the monarch butterfly 1) to generate a reporter rhythmic monarch cell line, and 2) to tag clock neurons in vivo to map the circadian neural circuits in monarch brains and antennae and determine if they are rewired seasonally.

**T3 Triad Texas A&M University**
(PI: K. Delmore; Co-PIs: C. Merlin, K. Entesari) 9/2019-9/2021
Title: Unravelling the genetic basis of seasonal migration in songbirds
Total award amount: $32,000
The objective of this grant is to establish an automated telemetry system in British Columbia to quantify migratory timing, orientation and gene expression in Swainson's thrushes hybrids.

**NSF IOS 1456985**
(PI: C. Merlin) 5/1/2015-4/30/2019
Title: Circadian clock control of seasonal migration
Total award amount: $550,863
The objectives of this project were to 1) genetically determine the role of the circadian clock in the control of the monarch butterfly migratory switch, and 2) to identify molecular pathways under clock-control in the monarch brain that underlie the photoperiodically-induced migratory switch.

**Center for Biological Clocks Research Bridge Funds Mini Grant** 2014
(MPI with P. Hardin)
Title: Knocking out and tagging clock genes in *Drosophila* and the Monarch butterfly using CRISPR/Cas9 and TALEN-mediated genome editing approaches
Total amount: $16,000

## University Services

Departmental

| | |
|---|---|
| 2024-2025 | Graduate Recruiting and Admissions Committee, Department of Biology, Chair |
| 2022-2024 | Graduate Recruiting and Admissions Committee, Department of Biology, Member |
| 2021-2023 | Graduate Program Committee, Department of Biology, Chair |
| 2020-2021 | Graduate Program Committee, Department of Biology, Member |
| 2020-2021 | Faculty Search Committee, Department of Biology, Member |
| 2015-2017 | Faculty Search Committee, Department of Biology, Member (two consecutive searches) |
| 2015 | Student/Postdoc Research Conference Committee, Department of Biology, Chair |
| 2014, 2016 | Student/Postdoc Research Conference Committee, Department of Biology, Member |

Interdepartmental

2016-2019 Texas A&M Genetics Graduate program, Graduate Recruiting Committee, Member
2015-2016 Texas A&M Genetics Graduate program, Graduate Advising Committee, Member
2014-2016 Texas A&M Institute for Neuroscience, Graduate Program Committee, Member

College-level

2020-2021 Biology Department Head Search Advisory Committee, Member

University-level

2023-2026 Texas A&M Center for Biological Clock Research Executive Committee, Member
2020-2021 Texas A&M President's Excellence Funds Steering Committee, Member
2019 Texas A&M Astronaut Scholarship Foundation Selection Committee, Member

## Selected Public Engagement & National/International Media Coverage

2025 Research featured as the cover story of *The New York Times Science Times* (print edition, "Migrating by compass", in addition to online coverage "In pursuit of the monarch's magnetic sense")
2024 Research featured by *The Transmitter*, "The non-model organism 'renaissance' has arrived – Meet 10 neuroscientists bringing model diversity back with the funky animals they study"
2024 Research featured by National Geographic magazine, "Saving the Monarchs"
2020 Research featured by PBS NOVA: Scientific documentary on Butterfly-inspired technological innovations