

## **CURRICULUM VITAE**

### **Julie A. Reynolds**

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### **CURRENT RESEARCH INTERESTS**

Comparative physiology, entomology, developmental physiology, adaptations to extreme environments, space and gravitational biology, biochemical and molecular control of diapause.

### **CAREER GOALS**

Obtain a position that allows me to pursue my love of research as well as engage in teaching and science outreach.

### **PROFESSIONAL DEVELOPMENT**

#### Education

**Ph.D., Biological Sciences, 2007**, Louisiana State University, Baton Rouge.

**M.S., Entomology, 2000**, Pennsylvania State University, University Park

**B.S. *cum laude*, Biology, 1996**, University of Alabama-Huntsville, Huntsville

#### Research and Work Experience

**September 2018-Present: Research Scientist, The Ohio State University, Columbus.** Activities include conducting research, writing manuscripts, supervising undergraduate researchers, and participating in science outreach programs.

**April 2014- August 2018: Postdoctoral Researcher, The Ohio State University, Columbus.** Activities include conducting research, writing manuscripts, supervising undergraduate researchers, and participating in science outreach programs.

**March 2013-April 2014: Postdoctoral Affiliate, The Ohio State University, Columbus.** Activities include conducting research, writing manuscripts, participating in science outreach programs.

**2007- March 2013: Postdoctoral Researcher, The Ohio State University, Columbus.** Duties included conducting research, writing manuscripts, supervising undergraduate researchers.

**2006: Graduate Teaching Assistant, Department of Biological Sciences, Louisiana State University, Baton Rouge.** Duties include teaching Biology 1005, Introductory Biology for Non-majors. Supervisor: Dr. William Wischusen.

**2000–2005: Graduate Research Assistant, Department of Biological Sciences, Louisiana State University, Baton Rouge.** Duties included conducting research and assisting with general laboratory tasks. Supervisor: Dr. Steven Hand

**1997–2000: Graduate Assistant, Department of Entomology, Pennsylvania State University, University Park.** Duties included conducting research, teaching, designing educational materials and displays. Supervisors: Dr. Dennis Calvin, Dr. Zane Smilowitz, Dr. Diana Cox-Foster, Dr. Kelly Hoover, and Ms. Maryann Frazier.

**1995-1997: Research Assistant, Micro-gravity and Biotechnology Laboratory, University of Alabama Huntsville, Huntsville, AL.** Duties included assisting with preparations for four Space Shuttle

missions (STS 67, 69, 76, 80). For each mission I helped to prepare and load flight hardware and prepare NASA documentation. Between flights I assisted with analyzing flight data and maintaining flight hardware. In addition I briefly joined the team to assist with pre-flight preparations for STS 95 in October 1998. Supervisor: Dr. Marian Lewis.

**1994–1995. Undergraduate Research Assistant, Department of Biological Sciences**

**University of Alabama-Huntsville, Huntsville, AL.** Duties included animal husbandry, maintaining laboratory, and preparing specimens for electron microscopy. I also assisted in preparing experiments for Space Shuttle Missions STS 67, 69, and 80. Supervisor: Dr. Richard Modlin.

Funding

1. National Science Foundation Grant IOS- 1755318

Refereed Publications

1. **Reynolds, J.A.** 2019. Noncoding RNA regulation of dormant states in evolutionarily diverse animals. *The Biological Bulletin* <https://doi.org/10.1086/705484>.
2. **Reynolds, J.A.** Nachman R.J., Denlinger, D.L. 2019. Distinct microRNA and mRNA responses elicited by ecdysone, diapause hormone and a diapause hormone analog at diapause termination in pupae of the corn earworm, *Helicoverpa zea*. *General and Comparative Endocrinology*, 278:68-78. doi: 10.1016/j.yggen.2018.09.013.
3. Meuti, M.E., Bautista-Jimenez, R., **Reynolds, J.A.** 2018. Evidence that microRNAs are part of the molecular toolkit regulating adult reproductive diapause in the mosquito, *Culex pipiens*. *PLoS One*. 13(11):e0203015. doi: 10.1371/journal.pone.0203015.
4. Bradshaw, W.E., Burkhart, J., Colbourne, J.K., Borowczak, R., Lopez, J., Denlinger, D.L., **Reynolds, J.A.**, Pfrender, M.E., Holzapfel, C.M. 2018. Evolutionary transition from blood-feeding to obligate non-biting in a mosquito. *Proceedings of the National Academy of Science U.S.A.*, 115:1009-1014
5. **Reynolds, J.A.** Peyton, J.T. and Denlinger, D.L. 2017. Changes in microRNA abundance may regulate diapause in the flesh fly, *Sarcophaga bullata*. *Insect Biochemistry and Molecular Biology*, 84: 1-14.
6. **Reynolds, J.A.**, Bautista-Jimenez, R. and Denlinger, D.L. 2016 Changes in histone acetylation as potential mediators of pupal diapause in the flesh fly, *Sarcophaga bullata*. *Insect Biochemistry and Molecular Biology*, 76:29-37.
7. Poelchau M.F., Huang X, Goff A, **Reynolds J**, Armbruster P. 2014. An experimental and bioinformatics protocol for RNA-Seq analyses of photoperiodic diapause in the Asian tiger mosquito, *Aedes albopictus*. *Journal of Visualized Experiments*. 93: e51961. doi: 10.3791/51961.
8. **Reynolds, J.A.**, Clark, J., Diakoff, S.J. Denlinger, D.L. 2013. Transcriptional evidence for small RNA regulation of pupal diapause in the flesh fly, *Sarcophaga bullata*. *Insect Biochemistry and Molecular Biology*, 43: 982-989.
9. Poelchau M. F., **Reynolds J. A.**, Elsik C. G., Denlinger D.L., Armbruster P.A. 2013. RNA-Seq reveals early distinctions and late convergence of gene expression between diapause and quiescence in the Asian tiger mosquito, *Aedes albopictus*. *Journal of Experimental Biology*, 216: 4082-90.
10. Poelchau, M.F., **Reynolds, J.A.**, Denlinger, D.L., Elsik, C.G., Armbruster, P.A. 2013. Transcriptome sequencing as a platform to elucidate molecular components of the diapause response in the Asian tiger mosquito, *Aedes albopictus*. *Physiological Entomology*, 38: 173-181.
11. Poelchau, M.F., **Reynolds, J.A.**, Denlinger, D.L., and Armbruster, P.A. 2013. Deep sequencing reveals complex mechanisms of diapause preparation in the invasive mosquito, *Aedes albopictus*. *Proceedings of the Royal Society B, Biological Sciences*, doi: 10.1098/rspb.2013.0143.
12. **Reynolds, J.A.**, Poelchau, M.F., Rahman, Z., Armbruster, P.A., Denlinger, D.L. 2012. Transcript

- profiling reveals mechanisms for lipid conservation during diapause in the mosquito, *Aedes albopictus*. *Journal of Insect Physiology*, <http://dx.doi.org/10.1016/j.jinsphys.2012.04.013>.
13. Poelchau, M. F., **Reynolds, J.A.**, Denlinger, D.L., Elsik, C.G., Armbruster, P.A. 2011. A de novo transcriptome of the Asian tiger mosquito, *Aedes albopictus*, to identify candidate transcripts for diapause preparation. *BMC Genomics*, 2011: 12:619.
  14. Hand, S.C., Menze, M.A., Borcar, A., Patil, Y., Covi, J.A., **Reynolds, J.A.**, Toner, M. 2011. Metabolic restructuring during energy-limited states: Insights from *Artemia franciscana* embryos and other animals. *Journal of Insect Physiology*. *Journal of Insect Physiology*, 57: 584-594.
  15. **Reynolds, J.A.** and S.C. Hand. 2009. Decoupling development and energy flow during embryonic diapause in the cricket, *Allonemobius socius*. *Journal of Experimental Biology* 212: 2065-2074.
  16. **Reynolds, J.A.** and S.C. Hand. 2009. Embryonic diapause highlighted by differential expression of mRNAs for ecdysteroidogenesis, transcription and lipid sparing in the cricket *Allonemobius socius*. *Journal of Experimental Biology* 212:2075-2084.
  17. **Reynolds, J.A.**, and S.C. Hand. 2004. Differences in isolated mitochondria are insufficient to account for respiratory depression during diapause in *Artemia franciscana* embryos. *Physiological and Biochemical Zoology* 77: 366-377.
  18. Lewis, M.L., **Reynolds, J.L.**, Cubano, L.A., Hatton, J.P., Lawless, B.D., Piepmeier, E.H. 1999. Spaceflight alters microtubules and increases apoptosis in human lymphocytes (Jurkat). *FASEB Journal*. 12: 1007-18.

#### Other Publications

1. **Reynolds, J.** 2018. How Insects Prepare for Winter. Research on the suspended-animation state called diapause might help save our crops—and our health. *Scientific American Observations*.
2. Meuti, M.E., Bautista-Jimenez, R., **Reynolds, J.A.** 2018. MicroRNAs are likely part of the molecular toolkit regulating adult reproductive diapause in the mosquito, *Culex pipiens*. bioRxiv preprint. [doi.org/10.1101/392738](https://doi.org/10.1101/392738).
3. **Reynolds, J.A.** 2017. Epigenetic Influences on Diapause. In: Heleen Verlinden, editor, *Advances in Insect Physiology*, Vol. 53, Oxford: Academic Press, pp. 115-144.

#### Invited Presentations at Scientific Meetings

1. **Reynolds, J.A.** For Everything There is a Season: microRNA Regulation of Insect Diapause. 2018. American Physiological Society, Intersociety, Comparative Physiology Meeting, New Orleans, LA, USA.
2. **Reynolds, J.A.** and Denlinger, D.L. 2016. Do Epigenetic Mechanisms Regulate Insect Diapause? Meeting of the North Central Branch of the Entomological Society of America. Cleveland, OH, USA.
3. **Reynolds, J.A.** and Denlinger, D.L. 2009 Does epigenetic gene silencing regulate diapause in *Sarcophaga crassipalpis*? Entomological Society of American Annual Meeting. Indianapolis, Indiana, USA.

#### Contributed Presentations at Scientific Meetings

1. **Reynolds, J.A.**, Meuti, M. E., and Denlinger, D.L. 2017. MicroRNA regulation of insect diapause. Entomological Society of America Annual Meeting. Denver, CO, USA.
2. Denlinger, D.L., Sim, C., **Reynolds, J.**, Xu, W.-H. 2017. Generating the complex diapause phenotype. Entomological Society of America Annual Meeting. Denver, CO, USA.
3. **Reynolds, J.A.** and Denlinger, D.L. 2016. MicroRNA regulation of an insect diapause. International Congress of Entomology. Orlando, FL, USA.

4. Bautista-Jimenez, R., **Reynolds, J.** and Denlinger, D.L. 2016 Meeting of the North Central Branch of the Entomological Society of America. Cleveland, OH, USA.
5. **Reynolds, J.A.** and Denlinger, D.L. 2016. MicroRNA regulation of an insect diapause. Society for Integrative and Comparative Biology Annual Meeting. Portland OR, USA.
6. **Reynolds, J.A.** and Denlinger, D.L. 2014. Small RNA regulation of diapause in the flesh fly, *Sarcophaga bullata*. American Physiological Society Comparative Physiology Conference. San Diego, California, USA.
7. **Reynolds, J.A.** and Denlinger, D.L. 2014. *Do HDACs regulate pupal diapause in the flesh fly, Sarcophaga bullata?* Society for Integrative and Comparative Biology Annual Meeting. Austin, Texas, USA.
8. **Reynolds, J.A.** and Denlinger, D.L. 2013. Do epigenetic mechanisms regulate diapause and their maternal block of diapause in the flesh fly, *Sarcophaga bullata*? Society for Integrative and Comparative Biology Annual Meeting. San Francisco, California, USA.
9. **Reynolds, J.A.,** Poelchau, M., Armbruster, P., Denlinger, D.L. 2013 Transcriptional changes in key metabolic enzymes contribute to metabolic restructuring during diapause in the mosquito, *Aedes albopictus*. Society for Integrative and Comparative Biology Annual Meeting. San Francisco, California, USA.
10. Poelchau, M., **Reynolds, J.A.,** Elsik, C., Denlinger, D.L, Armbruster, P. 2011. Transcriptome sequencing and the molecular underpinnings of ecological adaptation in the Asian tiger mosquito, *Aedes albopictus*. Entomological Society of America Annual Meeting. Reno Nevada, USA.
11. **Reynolds, J.A.** and Denlinger, D.L. 2010. Apoptosis related genes respond differently to UV radiation and cold stress in the fly *Sarcophaga crassipalpis*. American Physiological Society Comparative Physiology Conference. Westminster, Colorado, USA.
12. **Reynolds, J.A.** and S.C. Hand. 2005. Biochemical indicators of metabolic poise during development and diapause of cricket embryos. Society for Integrative and Comparative Biology annual meeting. San Diego, CA, USA.
13. **Reynolds, J.A.** and S.C. Hand. 2004. Developmental arrest and metabolic downregulation in embryos of the Southern ground cricket, *Allonemobius socius*. Society for Integrative and Comparative Biology annual meeting. New Orleans, LA, USA.
14. **Reynolds, J. A.** and Hand, S.C. 2002. Depression of aerobic metabolism during diapause: insights from *Artemia franciscana* embryos. Society for Integrative and Comparative Biology annual meeting, Anaheim, CA, USA.
15. **Reynolds, J.** and D. Calvin. 1999. Changes in the feeding pattern of European corn borer, *Ostrinia nubilalis* Hübner, larvae caused by *Bacillus thuringiensis* Cry1A(b) endotoxin. National Meeting of the Entomological Society of America, Atlanta, GA, USA.

#### Outreach Activities

**Girl Scouts Bugs Are For Girls, organizer. 2018 and 2019.** A collaborative outreach event where approximately 40 Brownie level Girl Scouts from Westerville earned their 'Bugs' badge by completing activities that were led by women from EEOB and Entomology Departments.

**Family Science Night organizer, Hanby Elementary School, 2014 and 2015.** Approximately 200 students and their families learned about basic science concepts through hands-on activities.

**Girl Scouts Entrepreneurial Fair presenter, March 2015.** Approximately 150 Girl Scouts and their adult leaders learned about biology careers through hands-on activities with live insects.

**Westerville Partners for Education Starry Night Festival presenter, April 2014, 2016, 2017, and 2018.** Each year over 2,000 people have had the opportunity to learn about live insects and arthropods at a community science and art festival.

**Nature and Science Club leader, Hanby Elementary School, 2013-2014 school year.** Student participants learned about entomophagy, termite trail-following behavior, birds, kitchen chemistry, and other topics through hands-on activities.

**Career Day, Blendon Middle School and Heritage Middle School, Westerville. 2013, 2014, 2016, 2017, 2018, and 2019** Students learned about Entomology careers.

**S.T.E.A.M. Hub, participant 2014.** Community scientists and teachers in the Westerville School District met to exchange ideas and form partnerships to enhance science learning in elementary classrooms.

#### Awards and Scholarships

**Society for Integrative and Comparative Biology.** Broadening Participation Travel Award. 2013. \$500.

**American Physiological Society** Recognition Travel Award. 2010. \$250.

**BioGrads Research Award** 2003, 2004, and 2005. Department of Biological Sciences Graduate Student Association. \$ 900 over three years.

**Orthoptera Society Research Grant.** 2002. Physiological and Biochemical Characteristics of Embryonic Diapause in the Ground Cricket, *Allonemobius socius*. \$700.

**Sigma Xi Grant in Aid of Research.** 2001. Differential Gene Expression in Diapause and Non-diapause embryos of the ground cricket *Allonemobius socius*. \$1000.

**Yendol Memorial Travel Award.** 1999. Department of Entomology Pennsylvania State University. \$ 250.

**Graduate Student Top-Up Award.** 1997 – 1999. Department of Entomology Pennsylvania State University.

**Maryville College Scholarship.** 1991.

**National Presbyterian College Scholarship.** 1991.

#### Memberships in Professional Societies

**American Physiological Society,** 2002-present

**Society for Integrative and Comparative Biology,** 2000-present

**Entomological Society of America,** 1997-present

**American Scientific Affiliation,** 2012-present

**Sigma Xi,** 1996-2004