

## Curriculum Vitae

**Nicholas M. Teets**

Assistant Professor

Department of Entomology

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### EDUCATION:

- 2012 PhD in Entomology, Ohio State University, Columbus, OH  
Advisor: Professor David L. Denlinger  
*Thesis title:* Cellular and Molecular Mechanisms of Environmental Stress Tolerance in Insects
- 2007 B.S. in Zoology, Minor in Mathematics, Miami University, Oxford, OH  
*Summa Cum Laude, Honors with Distinction*  
Advisor: Professor Richard E. Lee, Jr.  
*Thesis title:* *In vivo* and *in vitro* rapid cold-hardening in the Antarctic midge, *Belgica antarctica*: Evidence of a role for calcium

### EXPERIENCE:

- 2016-present Assistant Professor, Department of Entomology, University of Kentucky
- 2013-2016 Postdoctoral Associate, Department of Entomology and Nematology, University of Florida, Advisor: Dr. Daniel A. Hahn
- 2012-2013 Postdoctoral Researcher, Department of Evolution, Ecology, and Organismal Biology, Ohio State University, Advisor: Dr. David L. Denlinger
- 2007-2012 Graduate Research Fellow, Ohio State University, Advisor: Dr. David L. Denlinger
- 2005-2007 Honors Research, Miami University Laboratory for Ecophysiological Cryobiology, Advisor: Dr. Richard E. Lee
- 2003-2004 Undergraduate Research Assistant, Miami University Department of Zoology, Advisor: Dr. Sheldon Guttman

### TEACHING:

- 2014 Instructor, Molecular Biology Techniques Course, Department of Entomology and Nematology, University of Florida
- 2010,2012 Instructor, PAST Foundation Summer Entomology Course (2010: Ohio State University, 2012: Kelley's Island Field School)
- 2009,2011 Lab Instructor, Graduate Level Insect Physiology, Department of Entomology, Ohio State University
- 2004-2007 Supplemental Instructor, Department of Chemistry, Miami University
- 2004-2007 Peer-Led Team Learning Workshop Leader, Department of Chemistry, Miami University

## GRANTS and FELLOWSHIPS:

- 2014 USDA NIFA Fellowships Program. **Project title:** Improving the efficacy of Sterile Insect Technique by enhancing male performance with targeted overexpression of antioxidant defense systems. (\$149,998 for 2 yrs)
- 2007,2012 Distinguished University Fellowship, Ohio State University (\$36,000 + tuition)
- 2007-2011 College of Biological Sciences Dean's Fellowship, Ohio State University (\$84,000 + tuition)

## PUBLICATIONS:

18. Terhzaz, S., **Teets, N.M.**, Cabrero, P., Henderson, L., Ritchie, M.G., Nachman, R.J., Dow, J.A.T., Denlinger, D.L., Davies, S.A. 2015. Insect capa neuropeptides impact desiccation and cold tolerance. *Proceedings of the National Academy of Sciences U.S.A.*, **112**, 2882-2887.
17. Kelley, J. L., Peyton, J. T., Fiston-Lavier, A.-S., **Teets, N. M.**, Yee, M. C., Johnston, J. S., Bustamante, C. D., Lee, R. E. and Denlinger, D. L. 2014. Compact genome of the Antarctic midge is likely an adaptation to an extreme environment. *Nature Communications* **5**, 4611.
16. Kawarasaki, Y., **Teets, N. M.**, Denlinger, D. L. and Lee, R. E. 2014. Alternative overwintering strategies in an Antarctic midge: freezing versus cryoprotective dehydration. *Functional Ecology* **28**, 933-943.
15. Kawarasaki, Y., **Teets, N. M.**, Denlinger, D. L. and Lee, R. E. 2014. Wet hibernacula promote inoculative freezing and limit the potential for cryoprotective dehydration in the Antarctic midge, *Belgica antarctica*. *Polar Biology* **37**, 753-761.
14. **Teets, N. M.** and Denlinger, D. L. 2014. Surviving in a frozen desert: Environmental stress physiology of terrestrial Antarctic arthropods. *Journal of Experimental Biology* **217**, 84-93.
13. Kawarasaki, Y., **Teets, N. M.**, Denlinger, D. L. and Lee, R. E. 2013. The protective effect of rapid cold-hardening develops more quickly in frozen versus supercooled larvae of the Antarctic midge, *Belgica antarctica*. *Journal of Experimental Biology* **216**, 3937-3945.
12. **Teets, N. M.** and Denlinger, D. L. 2013. Physiological mechanisms of seasonal and rapid cold-hardening in insects. *Physiological Entomology* **38**, 105-116.
11. **Teets, N. M.**, Yi, S. X., Lee, R. E. and Denlinger, D. L. 2013. Calcium signaling mediates cold sensing in insect tissues. *Proceedings of the National Academy of Sciences U.S.A.* **110**, 9154-9159.

10. **Teets, N. M.** and Denlinger, D. L. 2013. Autophagy in Antarctica: Combating dehydration stress in the world's southernmost insect. *Autophagy* **9**, 629-631.
9. **Teets, N. M.**, Kawarasaki, Y., Lee, R. E. and Denlinger, D. L. 2013. Expression of genes involved in energy mobilization and osmoprotectant synthesis during thermal and desiccation stress in the Antarctic midge, *Belgica antarctica*. *Journal of Comparative Physiology B* **183**, 189-201.
8. **Teets, N. M.**, Peyton, J. T., Colinet, H., Renault, D., Kelley, J. L., Kawarasaki, Y., Lee, R. E. and Denlinger, D. L. 2012. Gene expression changes governing extreme dehydration tolerance in an Antarctic insect. *Proceedings of the National Academy of Sciences U.S.A.* **109**, 20744-20749. **Recommended by Faculty of 1000**
7. **Teets, N. M.**, Peyton, J. T., Ragland, G. J., Colinet, H., Renault, D., Hahn, D. A. and Denlinger, D. L. 2012. Combined transcriptomic and metabolomic approach uncovers molecular mechanisms of cold tolerance in a temperate flesh fly. *Physiological Genomics* **44**, 764-777. **Recommended by Faculty of 1000**
6. **Teets, N. M.**, Kawarasaki, Y., Lee, R. E. and Denlinger, D. L. 2012. Energetic consequences of repeated and prolonged dehydration in the Antarctic midge, *Belgica antarctica*. *Journal of Insect Physiology* **58**, 498-505. **Featured in a New Scientist magazine article as well as "Outside JEB" in the Journal of Experimental Biology**
5. Goto, S. G., Philip, B. N., **Teets, N. M.**, Kawarasaki, Y., Lee, R. E. and Denlinger, D. L. 2011. Functional characterization of an aquaporin in the Antarctic midge *Belgica antarctica*. *Journal of Insect Physiology* **57**, 1106-1114.
4. **Teets, N. M.**, Kawarasaki, Y., Lee, R. E. and Denlinger, D. L. 2011. Survival and energetic costs of repeated cold exposure in the Antarctic midge, *Belgica antarctica*: a comparison between frozen and supercooled larvae. *Journal of Experimental Biology* **214**, 806-814.
3. Michaud, M. R., **Teets, N. M.**, Peyton, J. T., Blobner, B. M. and Denlinger, D. L. 2011. Heat shock response to hypoxia and its attenuation during recovery in the flesh fly, *Sarcophaga crassipalpis*. *Journal of Insect Physiology* **57**, 203-210.
2. Benoit, J. B., Lopez-Martinez, G., **Teets, N. M.**, Phillips, S. A. and Denlinger, D. L. 2009. Responses of the bed bug, *Cimex lectularius*, to temperature extremes and dehydration: levels of tolerance, rapid cold hardening and expression of heat shock proteins. *Medical and Veterinary Entomology* **23**, 418-425.
1. **Teets, N. M.**, Elnitsky, M. A., Benoit, J. B., Lopez-Martinez, G., Denlinger, D. L. and Lee, R. E. 2008. Rapid cold-hardening in larvae of the Antarctic midge *Belgica antarctica*: cellular cold-sensing and a role for calcium. *American Journal of Physiology – Regulatory, Integrative, and Comparative Physiology* **294**, R1938-R1946. **Featured in "Outside JEB" in the Journal of Experimental Biology**

## **AWARDS and HONORS:**

- 2015 Runner-up, University of Florida Postdoc Research Symposium oral presentations (\$100)
- 2015 Selected to participate in New Generation of Polar Researchers Leadership Symposium, May 2-9, 2015.
- 2013 Entomological Society of America John Henry Comstock Award for excellence in graduate research (\$1000 + meeting travel expenses)
- 2013 First Place, Ohio Agricultural Research and Development Center Student Poster Competition (\$500)
- 2013 Ohio Agricultural Research and Development Center William E. Krausse Director's Award for Excellence in Graduate Research (\$1000)
- 2012 Skip Nault Research Award, Department of Entomology, Ohio State University (\$500) – given annually to the top student-authored paper in the department
- 2012 Entomological Society of America International Congress of Entomology Travel Award (\$3000) – for travel to International Congress of Entomology in Daegu, South Korea
- 2012 National Science Foundation Antarctic Service Medal – awarded to individuals with at least six weeks of field research experience at a US Antarctic base
- 2011 First Place, Physiology, Biochemistry, and Toxicology Section of the Entomological Society of America Student Paper Competition
- 2011 Ohio State University Ray Travel Award (\$750) – for travel to the Entomological Society of America Annual Meeting in Reno, NV
- 2011 NSF Travel Award (\$400) – for travel to the Society for Experimental Biology meeting in Glasgow, UK
- 2010 First place in PhD student competition, Ohio Valley Entomological Association (\$350)
- 2010 Delong Travel Award (\$1000) – for travel to Entomological Society of America Annual Meeting in San Diego, CA
- 2009 First place in PhD student competition, Ohio Valley Entomological Association (\$350)
- 2003-2007 National Merit Scholarship
- 2003-2007 Miami University Harrison Scholarship (4 years of full tuition)

## **INVITED PRESENTATIONS:**

9. Teets, N.M. Cellular and molecular physiology of environmental stress tolerance: How basic principles can inform novel pest control strategies. Highlighting a Career of Defining and Meeting Grand Challenges in Entomology: A Symposium in Honor of David L. Denlinger, Entomological Society of America, Portland, OR, November 18, 2014.
8. Teets, N.M. and Denlinger, D.L. Combining transcriptomics and metabolomics to reveal extreme adaptations in an Antarctic insect. Integrated Insect Omics: From Transcriptomics to Interactomics Symposium, Entomological Society of America, Austin, TX, November 13, 2013.

7. Teets, N.M. Entomology in Antarctica: Mechanisms of stress tolerance in the world's southernmost insect. University of Florida Department of Entomology and Nematology Seminar Series, September 19, 2013.
6. Teets, N.M., Peyton, J.T. and Denlinger, D.L. Drying out to survive the winter: Using RNA-Seq to identify genes involved in overwintering in the Antarctic midge, *Belgica antarctica*. New Complexities in the Regulation of Insect Diapause and Cold Hardiness Symposium, XXIV International Congress of Entomology, Daegu, Korea, August 21, 2012.
5. Teets, N.M. Entomology in Antarctica: Mechanisms of survival in the world's southernmost insect. Public outreach lecture in Kelley's Island, Ohio. June 7, 2012.
4. Teets, N.M., Kawarasaki, Y., Lee, R.E. and Denlinger, D.L. An energetic comparison of cold tolerance strategies in the Antarctic midge, *Belgica antarctica*: The world's southernmost insect. Molecular Physiology of Epithelial Transport in Insects Symposium, Society for Experimental Biology, Glasgow, UK, July 2, 2011.
3. Teets, N.M. and Kawarasaki, Y. Buggers! Entomology in Antarctica. Station Science Talk at Palmer Station, Antarctica, April 2011.
2. Teets, N.M., Lee, R.E. and Denlinger, D.L. Cellular cold-sensing and signal transduction: the calcium connection. Cold Case Files: Integrative Perspectives on Physiological and Molecular Responses of Insects to Low Temperature Symposium, Entomological Society of America, Indianapolis, IN, December 16, 2009.
1. Sarquis, J.L. and Teets, N.M. Peer-led team learning: A new teaching strategy or an old strategy with a new name? Eastern Kentucky University Chemical Education Seminar, February 17, 2006.

## CONTRIBUTED PRESENTATIONS

19. Teets, N.M., Handler, A.M. and Hahn, D.A. Testing the role of oxidative stress in sexual selection with transgenic overexpression of antioxidant defense systems in the Caribbean fruit fly, *Anastrepha suspensa*. Cellular and Molecular Biology Contributed Papers, Society for Integrative and Comparative Biology, West Palm Beach, FL, January 5, 2015.
18. Teets, N.M. and Denlinger, D.L. Quantitative phosphoproteomics reveals signaling events associated with rapid cold hardening in a temperate flesh fly. Thermal Physiology Poster Session, Society for Integrative and Comparative Biology, West Palm Beach, FL, January 5, 2015.
17. Cogley, T.R., Teets, N.M., Morgan, T.J. and Hahn, D.A. Survival of the Coldest: Developing methods to quantify autophagy during cold hardening in *Drosophila*

- melanogaster*. Thermal Physiology Poster Session, Society for Integrative and Comparative Biology, West Palm Beach, FL, January 5, 2015.
16. Dean, C.A.E. and Teets, N.M. The effect of diapause on stress tolerance in migratory milkweed bugs, *Oncopeltus fasciatus*. Physiology, Biochemistry, and Toxicology Poster Session, Entomological Society of America, Portland, OR, November 18, 2014.
  15. Teets, N.M. and Denlinger, D.L. Calcium signaling mediates cold sensing and triggers rapid cold hardening in insect tissues. Physiology, Biochemistry, and Toxicology Ten Minute Papers, Entomological Society of America, Austin, TX, November 10, 2013.
  14. Teets, N.M. and Denlinger, D.L. Calcium signaling mediates cold sensing and triggers rapid cold hardening in insect tissues. Ohio Agricultural Research and Development Center Annual Conference, Wooster, OH April 25, 2013.
  13. Teets, N.M., Peyton, J.T. and Denlinger, D.L. Uncovering the molecular mechanisms of cold tolerance in a temperature flesh fly using a combined transcriptomic and metabolomic approach. Ohio Agricultural Research and Development Center Annual Conference, Wooster, OH, April 26, 2012.
  12. Teets, N.M., Peyton, J.T. and Denlinger, D.L. Uncovering molecular mechanisms of cold tolerance in a temperature flesh fly using a combined transcriptomic and metabolomic approach. Ohio State University Department of Evolution, Ecology, and Organismal Biology Darwin Presentations, April 12, 2012.
  11. Kawarasaki, Y., Teets, N.M., Kobelkova, A., Denlinger, D.L. Lee, R.E. Rapid cold-hardening in the frozen state increases cold tolerance in the Antarctic midge, *Belgica antarctica*. Thermobiology Poster Session, Annual Meeting of the Society for Integrative and Comparative Physiology, Charleston, SC, January 4, 2012.
  10. Teets, N.M. and Denlinger, D.L. Cellular cold-sensing in the goldenrod gall fly, *Eurosta solidaginis*, involves a calcium/calmodulin signaling axis. Graduate Student Ten-Minute Paper Competition, Physiology, Biochemistry, and Toxicology Section, Entomological Society of America, Reno, NV, November 14, 2011. **First Place, Student Competition for the President's Prize**
  9. Teets, N.M. and Denlinger, D.L. Cellular cold-sensing in the goldenrod gall fly, *Eurosta solidaginis*, involves a calcium/calmodulin signaling axis. Department of Entomology Delong Competition, November 8, 2011.
  8. Teets, N.M., Kawarasaki, Y., Lee, R.E. and Denlinger, D.L. Survival and energetic costs of repeated cold exposure in the Antarctic midge, *Belgica antarctica*: a comparison between frozen and supercooled larvae. Graduate Student Ten-Minute Paper Competition, Integrative Physiological and Molecular Insect Systems Section, Entomological Society of America, San Diego, CA, December 13, 2010.

7. Teets, N.M., Kawarasaki, Y., Lee, R.E. and Denlinger, D.L. Survival and energetic costs of repeated cold exposure in the Antarctic midge, *Belgica antarctica*: a comparison between frozen and supercooled larvae. Ohio Valley Entomological Association, Columbus, OH, October 29, 2010. **First Place, PhD Category.**
6. Teets, N.M. and Denlinger, D.L. The role of calcium signaling during cellular cold-sensing and rapid cold-hardening in the goldenrod gall fly, *Eurosta solidaginis*. Department of Entomology Delong Competition, May 25, 2010. **Award for best talk.**
5. Teets, N.M., Phelan, P.L and Denlinger, D.L. Metabolomic analysis of seasonal cold acclimation in the goldenrod gall fly, *Eurosta solidaginis*. Graduate Student Ten-Minute Paper Competition, Integrative Physiological and Molecular Insect Systems Section, Entomological Society of America, Indianapolis, IN, December 14, 2009.
4. Teets, N.M. and Denlinger, D.L. The role of calcium signaling during cellular cold-sensing and rapid cold-hardening in the goldenrod gall fly, *Eurosta solidaginis*. Ohio Valley Entomological Association, Cincinnati, OH, November 6, 2009, **First Place, PhD Category.**
3. Teets, N.M. and Denlinger, D.L. Role of heat shock proteins during thermal stress in the milkweed bug, *Oncopeltus fasciatus*. Graduate Student Ten-Minute Paper Competition, Integrative Physiological and Molecular Insect Systems Section, Entomological Society of America, Reno, NV, November 17, 2008.
2. Teets, N.M., Elnitsky, M.A., Benoit, J.B., Lopez-Martinez, G., Denlinger, D.L. and Lee, R.E. Role of calcium and calmodulin in the cold tolerance of the Antarctic midge, *Belgica antarctica*. M.S. Student Paper Competition, North Central Branch of the Entomological Society of America, Columbus, OH, March 25, 2008.
1. Teets, N.M., Elnitsky, M.A., Benoit, J.B., Lopez-Martinez, G., Denlinger, D.L. and Lee, R.E. *In vivo* and *in vitro* rapid cold-hardening in the Antarctic midge, *Belgica antarctica*. Hibernation and Extreme Environments Poster Session, American Physiological Society Intersociety Conference: Comparative Physiology 2006: Integrating Diversity, Virginia Beach, VA, October 10, 2006.

#### **PROFESSIONAL DEVELOPMENT AND TRAINING:**

- 2015 Insect Genetic Technologies Research Coordination Network Technical Course, August 17-21, 2015, Rockville, MD – Week-long intensive course on transgenic and genome editing technologies in both model and non-model insects
- 2015 Next Generation of Polar Researchers Leadership Symposium, May 2-9, 2015, Wrigley Marine Science Center, Catalina Islands, CA – Weeklong professional development symposium for recent PhDs working in Arctic and Antarctic systems

2014 University of Florida College of Agriculture and Life Sciences Teaching Enhancement Symposium, August 19, 2014, Gainesville Florida.

### **PROFESSIONAL AFFILIATIONS:**

International Congress of Entomology  
Entomological Society of America  
Sigma Xi  
Society for Experimental Biology  
American Physiological Society  
Society for Integrative and Comparative Biology  
Ohio Valley Entomological Association

### **PROFESSIONAL SERVICE**

2015 Judge, International Graduate Student Showcase, XXV International Congress of Entomology  
2009-2015 Judge, Ohio Valley Entomological Association Annual Conference  
2015 Moderator and Judge, Society for Integrative and Comparative Biology  
2014-present Physiology, Biochemistry and Toxicology Awards Committee, Entomological Society of America  
2010-present Reviewer: Journal of Insect Physiology, Journal of Applied Biology, Journal of Thermal Biology, Insect Molecular Biology, Proceedings of the Royal Society B: Biological Sciences, Archives of Insect Biochemistry and Physiology, Environmental Entomology, Journal of Experimental Biology, Physiological Entomology, Journal of the Kansas Entomological Society, Canadian Journal of Zoology, FEBS Letters, African Journal of Microbiological Research, Proceedings of the National Academy of Sciences USA, PLoS One, Animal Biology, Journal of Medical Entomology, PeerJ  
2010-present Undergraduate Research Mentor (ten students total)  
2007-present Education and Outreach (various “bug” presentations at local libraries, elementary schools, camps, etc. >20 total presentations)  
2012 Panel Member and Reviewer, Ohio Agricultural Research and Development Center annual SEEDS grant competition  
2011 Symposium Organizer and Moderator, Entomological Society of America, Reno, NV  
2009-2011 Entomological Society of America Student Affairs Committee Representative  
2010-2011 Department of Entomology Curriculum Committee, Student Representative  
2008-2010 Department of Entomology Seminar Committee, Student Representative