

JOHANNA TAYLOR CANNON

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RESEARCH INTERESTS

- Evolution and phylogenetics in marine invertebrates
- Metazoan evolution and development
- Genomics and transcriptomics of non-model systems, bioinformatics

EDUCATION

- 2014 Ph.D. in Biological Sciences, **Auburn University**, Auburn, AL
Dissertation title: Hemichordate phylogeny: A molecular and genomic approach
- 2004 B.A. in Biology, *cum laude*, **Bryn Mawr College**, Bryn Mawr, PA

RESEARCH AND PROFESSIONAL EXPERIENCE

- 2014-present *Postdoctoral researcher*, Naturhistoriska riksmuseet, PI: Dr. Ulf Jondelius
Genomics of acoelomorph flatworms
- 2013-2006 *Graduate researcher*, Auburn University, PI: Dr. Kenneth M. Halanych
Molecular phylogenetics and phylogenomics of Hemichordata
- 2009 *Visiting Scientist*, Smithsonian Institution, United States Antarctic Program
Specialist: Antarctic pterobranch taxonomy and morphology (July 7 – Aug. 5)
- 2006 *Graduate Research Rotation*, Auburn University, PI: Dr. Scott Santos
Developed microsatellite primers for the Hawaiian shrimp *Halocaridina rubra*
- 2006-2004 *Laboratory Technician*, University of Virginia, PI: Dr. Bettina Winckler
Membrane protein trafficking in polarized neurons
- 2004-2003 *Undergraduate Researcher*, Bryn Mawr College, Advisor: Dr. Stephen Gardiner
Ultrastructural analysis of the photoreceptor structure in a polychaete larva

RESEARCH AWARDS AND GRANTS

- 2014 SciLifeLab National Projects Grant, Science for Life Laboratory, \$39,300
Title: “New methods for ancient worms: applying low-input protocols for single-molecule real-time (SMRT) sequencing to Acoelomorpha”
PIs: **Johanna Cannon** (lead) and Ulf Jondelius
- 2009 Smithsonian Institution Visiting Student Award, National Museum of Natural History, United States Antarctic Program Visitor (July 7 – August 5), \$3,725
- 2009 Grant-in-aid of Research Award, Bermuda Institute of Ocean Sciences, \$2,730
- 2008 Lerner-Gray Fund for Marine Research, American Museum of Natural History, New York, New York, \$1,996
- 2008 Graduate Student Research Award, Auburn University, \$1,000
- 2008 Best Student Poster Award, Division of Systematic & Evolutionary Biology, Society for Integrative and Comparative Biology Annual Meeting, \$150
- 2007 Libbie H. Hyman Memorial Scholarship, SICB, \$1,000

RESEARCH FELLOWSHIPS

- 2010 Patricia L. Dudley Fellowship, Friday Harbor Laboratories, \$3,000
- 2010-2008 Graduate Research Scholars Program, Alabama-National Science Foundation Experimental Program to Stimulate Competitive Research (EPSCoR), \$25,000
- 2007-2006 AU Cellular and Molecular Biosciences Doctoral Fellowship, \$18,000

TEACHING EXPERIENCE

- 2014 *Systematic Zoology*, Stockholm University, Guest Lecturer, Topic: “Molecular systematics” (3 Lectures) and Mentor for Student Project, Anna Berglund
- 2013 *Invertebrate Biodiversity Laboratory*, Auburn University, GTA
- 2013 *Marine Biology*, Auburn University, Guest Lecturer, Topic: “Polar Systems”
- 2013, 2012 *Organismal Biology*, Auburn University, Guest Lecturer, Topics: “Introduction to Invertebrates”, “Lophotrochozoa”, “Chordate Origins”
- 2012 *Organismal Biology Laboratory*, Auburn University, GTA
- 2011 *Evolution & Development of the Metazoans*, University of Washington, Friday Harbor Laboratories, GTA
- 2011-2009 *Graduate Student Mentor*, Auburn University, Undergraduate Research Project, Kristina Looney (Spring-Summer 2011), Emily Summers (2009-2010)
- 2011, 2010 *Genetics Laboratory*, Auburn University, GTA
- 2010, 2009 *Invertebrate Biodiversity Laboratory*, Auburn University, GTA (volunteer)
- 2009 *Graduate Student Mentor*, Bermuda Institute of Ocean Sciences, Fall Semester Research Project, Caitlin Kelly-Garrick (University of California, Berkeley)
- 2007 *Principles of Biology Laboratory*, Auburn University, GTA

FIELD EXPERIENCE

- 2013 *Research crew, R/V Poseidon, “IceAGE2”*. Chief Scientist: Saskia Brix-Elsig. Iceland, July 21 – August 4.
- 2013 *Research crew, R/V Nathaniel B. Palmer, “Icy Inverts”*. Chief Scientist: K.M. Halanych. Antarctica, January 1 – February 9.
- 2011 *Research crew, R/V Meteor, IceAGE*. Chief Scientist: Saskia Brix-Elsig. Iceland, August 27-September 28.
- 2009 *Research crew, R/V Seward Johnson, “Siboglinid symbiosis.”* Chief Scientist: K.M. Halanych. Gulf of Mexico, October 6-11

PROFESSIONAL SERVICE

- Organizer: Southeastern Ecology & Evolution Conference 2011, Auburn University
- Reviewer: *Biological Bulletin*, *Molecular Biology and Evolution*, *Zootaxa*

MEMBERSHIPS IN PROFESSIONAL SOCIETIES

- Global Invertebrate Genomics Alliance
- Society for Integrative and Comparative Biology
- Society for Systematic Biologists
- Association for Women in Science

TRAINING COURSES

- 2014 *Introduction to Genome Annotation*. Science for Life Laboratory (SciLifeLab), Uppsala, Sweden, March 31 – April 1
- 2010 *High Performance Computing for Phylogenetics Tutorial*, National Institute for Mathematical and Biological Synthesis, Knoxville, Tennessee, October 13-15
- 2009 *Taxonomy and Biology of Tunicates Course*, Smithsonian Tropical Research Institute, Bocas del Toro, Panama, June 4-18
- 2008 *Evolution and Development of the Metazoans Course*, Friday Harbor Laboratories, University of Washington, June 10-July 14
- 2007 *Marine Invertebrate Zoology Course*, Friday Harbor Laboratories, University of Washington, July 13-August 16

OUTREACH ACTIVITIES

- 2013 *Invited Speaker*, Science Café, The Gnu's Room Bookstore, Auburn, AL
Talk title: "Tigers in Antarctica: Auburn Research at the Bottom of the World"
- 2013 *Contributing blogger*, "Icy Inverts Antarctica 2013 Shipboard Blog", auburn.edu/antarctica
- 2013-2008 *Volunteer presenter*, AU-Explore science and math open house
- 2013, 2009 *Volunteer presenter*, Ogletree Elementary School, Auburn, AL
- 2012, 2008 *Judge*, South's BEST Robotics Competition, Auburn University
- 2011 *Contributing blogger*, "eXpedition log: IceAGE – M85/3", deepsea-research.org
- 2010, 2009 *Judge*, Undergraduate Research Symposium, Auburn University
- 2008 *Volunteer presenter*, Daughters and Mothers Exploring Science (DAMES) program for middle school girls and their mothers, Auburn University

INVITED TALKS

3. Hemichordate Molecular Phylogeny and Evolution. **Cannon, J.T.** Sars International Centre for Marine Molecular Biology. Bergen, Norway. (September 18, 2012).
2. Hemichordate Phylogenomics. **Cannon, J.T.** Alabama Commission on Higher Education. Montgomery, Alabama. (December 4, 2009).
1. Mysterious creatures of strange aspect: What is a pterobranch? **Cannon, J.T.** Smithsonian Institution, Department of Invertebrate Zoology. (July 16, 2009).

ORAL PRESENTATIONS

9. The Xenacoelomorpha are basal bilaterians: Evidence from phylogenomics. **Cannon, J.T.**, B. Vellutini, J.P. Smith III, F. Ronquist, U. Jondelius, and A. Hejnol. *International Symposium on Flatworm Biology*. Oxford, United Kingdom. August 6, 2015.
8. IceAGE Genetic Results: Hemichordates. **Cannon, J.T.** Senckenberg Biodiversity Institute. *IceAGE Workshop: Genetic Results*. Wilhelmshaven, Germany. September 13, 2012.
7. Phylogenomics reveals deep molluscan relationships. Kocot, K.M., **J.T. Cannon**, C. Todt, A.B. Kohn, M.R. Citarella, A. Meyer, C. Schander, S.R. Santos, L.L. Moroz, B. Lieb, and K.M. Halanych. *American Malacological Society*. Pittsburgh, PA. (July 2011).

6. Phylogenomics of Hemichordata within Deuterostomia. **Cannon, J.T.**, K.M. Kocot, S.R. Santos, B.J. Swalla and K.M. Halanych. *Southeastern Ecology & Evolution Conference*. Auburn, Alabama. (March 2011).
5. Phylogenomics of Hemichordata within Deuterostomia. **Cannon, J.T.**, K.M. Kocot, S.R. Santos, B.J. Swalla and K.M. Halanych. *Society for Integrative and Comparative Biology*. Salt Lake City, Utah. (January 2011).
4. Phylogenomic investigation of molluscan evolutionary relationships. Kocot, K.M., **J.T. Cannon**, C. Todt, A.B. Kohn, M.R. Citarella, A. Meyer, C. Schander, S.R. Santos, L.L. Moroz, B. Lieb, K.M. Halanych. *Society for Integrative and Comparative Biology*. Salt Lake City, Utah. (January 2011).
3. Comparative transcriptome analyses of Siboglinid annelids with special interest in mechanisms maintaining symbiosis. Halanych, K.M., D.J. Thornhill, C. Schander, K.T. Fielman, K.M. Kocot, **J.T. Cannon**, S.R. Santos. *Society for Integrative and Comparative Biology*. Salt Lake City, Utah. (January 2011).
2. Phylogenomics of Hemichordata within Deuterostomia. **Cannon, J.T.**, K.M. Kocot, S.R. Santos, B.J. Swalla and K.M. Halanych. *Evolution*. Portland, Oregon. (June 2010).
1. Hemichordate evolution: Derived body plans and suspect families. **Cannon, J.T.**, A.L. Rychel, B.J. Swalla and K.M. Halanych. *Society for Integrative and Comparative Biology*. Boston, Massachusetts. (January 2009).

POSTER PRESENTATIONS

7. Hemichordata Global Diversity and Evolution. Tassia, M.G., **J.T. Cannon**, C. Konikoff, L. Perry, P. Kaur, K. Dunn, N. Shenkar, K.M. Halanych, and B.J. Swalla. *Society for Integrative and Comparative Biology*. West Palm Beach, Florida. (January 2015).
6. Phylogenomics of Ambulacraria (Hemichordata + Echinodermata). **Cannon, J.T.**, K.M. Kocot, D.A. Weese, D.S. Waits, B.J. Swalla, S.R. Santos, and K.M. Halanych. *International Congress on Invertebrate Morphology*. Berlin, Germany. (August 2014).
5. Hemichordate phylogeny and a new deep-sea clade. **Cannon, J.T.**, B.J. Swalla, K.M. Halanych. *Department of Biological Sciences Graduate Research Forum*. Auburn, AL. (April 2013).
4. Molecular Phylogeny of Hemichordata and Insights into Ancestors. **Cannon, J.T.**, A.L. Rychel, B.J. Swalla and K.M. Halanych. *Southeastern Ecology and Evolution Conference*. Tallahassee, Florida. (March 2008).
3. Hemichordate Relationships and Insights into Ancestors*. **Cannon, J.T.**, A.L. Rychel, B.J. Swalla and K.M. Halanych. *Society for Integrative and Comparative Biology*. San Antonio, Texas. (January 2008).
2. Ultrastructural observations of an unusual sensory structure in the cerebral ganglion of *Owenia fusiformis* and *Myriochele* sp. (Polychaeta: Oweniidae). Gardiner, S.L., A.K. Dewan, M.L. Schwartz, **J.T. Cannon**, and B.F. Dickey. *9th International Polychaete Conference*. Portland, Maine. (July 2007).
1. Axonal Targeting of NgCAM: Testing the Transcytotic Pathway Model. Yap, C., D. Wisco, **J.T. Cannon**, P. Kujala, J. Klumperman, E. Anderson, and B. Winckler. *American Society for Cell Biology*. San Francisco, California. (December 2005).

PUBLICATIONS

8. Havird, J.C., K.M. Kocot, P.M. Brannock, **J.T. Cannon**, D.S. Waits, D.A. Weese, S.R. Santos, and K.M. Halanych. Reconstruction of cyclooxygenase evolution in animals suggests variable, lineage-specific prostaglandin synthesis pathways. *Journal of Molecular Evolution*. 80: 193-208.
7. **Cannon, J.T.**, K.M. Kocot, D.S. Waits, D.A. Weese, B.J. Swalla, S.R. Santos, and K.M. Halanych. Phylogenomic Resolution of the Hemichordate and Echinoderm Clade. 2014. *Current Biology*. 24: 2827-2832.
6. **Cannon, J.T.**, B.J. Swalla, and K.M. Halanych. 2013. Hemichordate molecular phylogeny reveals a novel cold-water clade of harrimaniid acorn worms. *Biological Bulletin*. 225: 194-204.
5. Halanych, K.M., **J.T. Cannon**, A.R. Mahon, B.J. Swalla, and C.R. Smith. 2013. Modern Antarctic acorn worms form tubes. *Nature Communications*. 4: 2738.
4. Kocot, K.M., **J.T. Cannon**, C. Todt, M.R. Citarella, A.B. Kohn, A. Meyer, S.R. Santos, C. Schander, L.L. Moroz, B. Lieb, and K.M. Halanych. 2011. Phylogenomics reveals deep molluscan relationships. *Nature*. 477: 452-456.
3. Kocot, K.M., **J.T. Cannon**, and K.M. Halanych. Elucidating animal phylogeny; advances in knowledge and forthcoming challenges. 2010. In B. Schierwater and R. deSalle, eds., *Key Transitions in Animal Evolution*. CRC Press, Boca Raton, Florida.
2. **Cannon, J.T.**, A.L. Rychel, H. Eccleston, K.M. Halanych, and B.J. Swalla. 2009. Molecular phylogeny of Hemichordata, with updated status of deep-sea enteropneusts. *Molecular Phylogenetics and Evolution*. 52: 17-24.
1. Yap, C., D. Wisco, P. Kujala, Z. Lasiecka, **J.T. Cannon**, M.C. Chang, H. Hirling, J. Klumperman, and B. Winckler. 2007. The somatodendritic endosomal regulator NEEP21 facilitates axonal targeting of L1/NgCAM. *Journal of Cell Biology*. 180: 827-842.

OTHER PUBLICATIONS

1. Halanych, K.M., **J.T. Cannon**, and J. Benito. 2012. Pterobranchia. Pp. 586-587. In McGraw Hill, Editors, McGraw Hill Encyclopedia of Science & Technology, 11th Edition. Volume 14. McGraw Hill, New York.

MANUSCRIPTS IN PREPARATION OR UNDER REVIEW

5. **Cannon, J.T.**, B. Vellutini, J.S. Smith III, F. Ronquist, U. Jondelius, and A. Hejnol. Xenacoelomorpha are the sister group to Nephrozoa. Under review. *Nature*.
4. **Cannon, J.T.** and K.M. Kocot. Phylogenomic approaches using RNAseq data. In S. Bourlat, Ed., Marine Genomics – Methods and Protocols. Springer. In preparation.
3. D’Aniello, S., J. Delroisse, A. Valero-Garcia, E.K. Lowe, M. Byrne, **J.T. Cannon**, K.M. Halanych, M.R. Elphick, J. Malfet, S. Kaul-Strehlow, C.J. Lowe, P. Flammang, J. Smith, E. Ullrich-Luter, A. Wanninger, and M.I. Arnone. Shedding light on opsin evolution in the Ambulacraria. Under review. *Marine Genomics*.
2. Kocot, K.M., T.H. Struck, J. Merkel, D.S. Waits, C. Todt, P.M. Brannock, D.A. Weese, **J.T. Cannon**, L.L. Moroz, B. Leib, and K.M. Halanych. Phylogenomics of Lophotrochozoa with consideration of systematic error. Under review. *Systematic Biology*.
1. Tassia, M.G., **J.T. Cannon**, C.E. Konikoff, N. Shenkar, K.M. Halanych, and B.J. Swalla. The Global Diversity of the Hemichordata. Under review. *PLoS One*.