

Jason Macrander
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Positions Held

- 2018 – Present **Assistant Professor of Marine Biology**, Florida Southern College, Lakeland
Department of Biology.
- 2016 – 2018 **Postdoctoral Research Fellow**, University of North Carolina, Charlotte
Department of Biological Sciences. Adviser: Dr. Adam Reitzel

Education

- 2011 – 2016 **Doctor of Philosophy**, Ohio State University
Evolution, Ecology, and Organismal Biology. Adviser: Dr. Meg Daly
Graduate Interdisciplinary Specialization: College and University Teaching
- 2008 – 2010 **Masters of Science**, University of Nebraska – Lincoln
Ecology, Evolution, and Behavior. Adviser: Dr. Guillermo Orti
- 2002 - 2007 **Bachelor of Science** (dual degrees), University of Nebraska – Lincoln
Biological Sciences.
Fisheries and Wildlife.

Acquired Funding

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| 2014 – 2016 | National Science Foundation. Dissertation Research: The role of gene duplication and symbiont association in the evolution of sea anemone venom (Co-PI with Meg Daly) [Award Number 1401014] | \$19,687 |
| 2012 - 2013 | Columbus Zoo – Ohio State University. Evolution of Sea Anemone Venom Genes. (Co-PI with Meg Daly) | \$4,600 |
| 2008 - 2009 | University of Nebraska Biological Sciences Special Funds | \$1,000 |

Publications (N: 21, h-index: 7, RG Score: 24.52, *undergraduate **graduate mentee)

- Ivanina, A., Borah, B., Rimkevicius, T., **Macrander, J.**, Piontkivska, H., Sokolova, I., Beniash, E. 2018. The role of the vascular endothelial growth factor (VEGF) signaling in biomineralization of the oyster *Crassostrea gigas*. *Front. Mar. Sci.* 5:309
- Macrander, J.**, Panda, J., Janies, D., Daly, M., Reitzel, A.M. 2018. Venomix: A simple bioinformatic pipeline for identifying and characterizing toxin gene candidates from transcriptomic data. *PeerJ* 6:e5361
- Leach, W.B., **Macrander, J.**, Peres, R., Reitzel, A.M. 2018. Transcriptome-wide analysis of differential gene expression in response to light:dark cycles in a model cnidarian. *Comp. Biochem. Physiol. Part D Genomics Proteomics.* 26: 40 – 49.
- Reitzel, A.M., **Macrander, J.**, Mane-Padros, D., Fang, B., Sladek, F.M., Tarrant, A.M. 2018. Conservation of DNA and ligand binding properties of retinoid X receptor from the placozoan *Trichoplax adhaerens* to human. *J. Steroid Biochem. Mol. Biol.*
- Columbus-Shenkar, Y.Y., Sachkova, M.Y., **Macrander, J.**, Fridrich, A., Mondepalli, V., Reitzel, A.M., Sunagar, K., Moran, Y. 2018. Dynamics of venom composition across a complex life cycle. *eLife*: e35014.
- Carrier, T.**, **Macrander, J.**, Reitzel, A. 2018. A microbial perspective on the life-history evolution of marine invertebrate larvae: if, where, and when to feed. *Marine Ecology*: e12490.
- Krishnarajuna, B., MacRaild, C.A., Sunanda, P., Morales, R.A.V., Peigneur, S., **Macrander, J.**, Daly, M., Raghothama, S., Dhawanf, V., Chauhanf, S., Tytgat, J., Pennington, M.W., Norton, R.S. 2018.

- Structure, Folding, and Stability of a Minimal Homologue of ShK from *Anemonia sulcata*. *Peptides*. 99: 169 – 178.
- Macrander, J.**, Dimond, J., Bingham, B., Reitzel, A. 2018. Transcriptome sequencing and characterization of *Symbiodinium muscatinei* and *Elliptochloris marina*, symbionts found within the aggregating sea anemone *Anthopleura elegantissima*. *Marine Genomics*. 37: 82 – 91.
- Macrander, J.**, Daly, M. 2016. Evolution of the Cytolytic Pore-forming Proteins (Actinoporins) in Sea Anemones (Actiniaria). *Toxins*. 8: 36.
- Titus, B.M., Daly, M., **Macrander J.**, del Rio, A*, Santos, S.R., Chadwick, N.E. 2016. Contrasting abundance and contribution of clonal proliferation to the population structure of the corkscrew sea anemone *Bartholomea annulata* in the tropical Western Atlantic. *Invertebrate Biology*. 136: 62 – 74.
- Mercier, A., Baillon, S., Daly, M., **Macrander, J.**, Hamel, J.F. 2016. Biology of a deep-water sea anemone (Anthozoa: Actiniidae) from eastern Canada: spawning, development, and growth. *Deep Sea Res. Part II: Top. Stud. Oceanogr.*, 137: 359-367
- Lewis Ames, C., **Macrander, J.** 2016. Evidence for an alternative mechanism of toxin production in the box jellyfish *Alatina alata*. *Integrative and Comparative Biology*. 56: 973-988.
- Macrander, J.**, Broe, M., Daly, M. 2016. Tissue-Specific Venom Composition and Differential Gene Expression in Sea Anemones. *Genome Biology and Evolution*. 8: 2358-2375.
- Macrander, J.** Broe, M, Daly, M. 2015. Multi-copy venom genes hidden in de novo transcriptome assemblies, a cautionary tale with the snakelocks sea anemone *Anemonia sulcata* (Pennant, 1977). *Toxicon*. 108: 184-188.
- Willis, S.C., Winemiller, K.O., Montaña, C.G., Reiss, P., **Macrander, J.**, Farias, I.P., Orti, G. 2015. Population genetics of the speckled peacock bass (*Cichla temensis*), South America’s most important sport fishery. *Conservation Genetics*, 16: 1345.
- Macrander, J.**, Brugler, M., Daly, M. 2015. A RNA-seq approach to identify putative toxins from acrorhagi in aggressive and non-aggressive *Anthopleura elegantissima* polyps. *BMC Genomics*, 16: 221
- Nguyen, T., Collins-Silva, J., Podicheti, R., **Macrander, J.**, Yang, W., Nazarenus, T., Nam, J., Jaworski, J., Lu, C., Scheffler, B., Mockaitis, K., Cahoon, E. 2012. Camelina seed transcriptome: A tool for meal and oil improvement and translational research. *Plant Biotechnology Journal*, 11: 759 – 69.
- Willis, S., **Macrander, J.**, Farias, I., Orti, G. 2012. Simultaneous delimitation of species and quantification of interspecific hybridization in Amazonian peacock cichlids (genus *Cichla*) using multi-locus data. *BMC Evolutionary Biology*, 12: 96.
- Macrander, J.**, Willis, S.C., Gibson, S*, Orti, G., Hrbek, T., 2012. Polymorphic microsatellite loci for the Amazonian Peacock Basses, *Cichla orinocensis* and *C. temensis*, and cross-species amplification in other *Cichla* species. *Mol. Ecol. Resour.* doi: <http://dx.doi.org/10.1111/j.1755-0998.2012.03173.x>.
- Li C., Bessert, M. L., **Macrander, J.**, Orti, G. 2009. Low variation but strong population structure in mitochondrial control region of plains topminnow, *Fundulus sciadicus*. *Journal of Fish Biology* 74:1037 - 1048.
- Li C., Bessert, M. L., **Macrander, J.**, Orti, G. 2007. Microsatellite loci for the plains topminnow (*Fundulus sciadicus*, Fundulidae). *Molecular Ecology Notes*, 7: 691 - 693.

Preprints

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- Stampar, S.N., Broe, M.B., **Macrander, J.**, Reitzel, A.M., Daly, M. (2018) Linear Mitochondrial genome in Anthozoa (Cnidaria): A case study in Ceriantharia. *PeerJ Preprints* 6:e27042v1
<https://doi.org/10.7287/peerj.preprints.27042v1>

Presentations and Invited Talks

- Macrander, J.**, Panda, J., Janies, D., Daly, M., Reitzel, A.M. 2018. POSTER: Venomix: A simple bioinformatic pipeline for identifying and characterizing toxin gene candidates from transcriptomic data. Society for Integrative and Comparative Biology, San Francisco, CA.
- Macrander, J.** Sachkova, M.Y., Moran, Y., Reitzel, A.M. 2018. The starlet sea anemone (*Nematostella vectensis*) as an emerging model organism for venom studies. Society for Integrative and Comparative Biology, San Francisco, CA.
- Macrander, J.** 2017. Keep Your Friends Close and Your Anemones Closer: Symbiosis and Venom Evolution In Sea Anemones. Department of Biology, Florida Southern College, Lakeland, FL.
- Macrander, J.** 2017. From cells to symbionts: evolution of venom in sea anemones. Department of Biological Sciences, Sam Houston State University, Huntsville, TX.
- Macrander, J.** 2017. A phylogenomic and bioinformatic approach to understanding venom diversity in sea anemones. Biological Sciences, University of North Carolina, Charlotte, NC.
- Macrander, J.**, 2017. God only knows what the hell *Nematostella* venom actually does. ECOEVODEVOTOGELATO 2.0, Whitney Lab, St. Augustine, FL
- Macrander, J.**, Moran, Y., Reitzel, A.M. 2017. Predators, Prey, and Symbionts: Sea anemones (Actiniaria) as a dynamic model for coevolution in venom. Society for Integrative and Comparative Biology, New Orleans, LA.
- Macrander, J.**, Dimond, J., Bingham, B., and Reitzel, AM. 2017. POSTER: Dueling Symbioses: An ‘Omic Perspective into the Sea Anemone *Anthopleura elegantissima* and Their Zooxanthellate and Zoochorellate Symbionts. Society for Integrative and Comparative Biology, New Orleans, LA.
- Macrander, J.**, Reitzel, A. 2016. From Toxic to Pathogenic: Sea Anemones as a Model to Study Venom Evolution and Microbial Interactions. Department of Bioinformatics and Genomics, University of North Carolina, Charlotte, NC.
- Macrander, J.**, Broe, M, Daly, M. 2016. A high-throughput investigation into the tissue specific venom composition and differential gene expression in three species of sea anemone. Society for Integrative and Comparative Biology, Portland, OR
- Macrander, J.** and Daly, M. 2015 Transcriptomics with a Scalpel, Not a Hatchet. SSB Standalone Meeting, Ann Arbor, MI.
- Macrander, J.** 2015. Venomics of sea anemones: A Bioinformatic Approach to Tissue-Specific Venom Composition and Toxin Gene Family Evolution. Computational and Statistical Genomics Branch, NHGRI Division of Intramural Research, National Institutes of Health, Bethesda, MD
- Macrander, J.** and Daly, M. 2014. The Evolution of the Sodium and Potassium Ion Channel Toxins in Sea Anemones: A combined RNASeq and Bioinformatics Approach. Society for Integrative and Comparative Biology, Austin, TX.
- Macrander, J.**, Willis, S, Hrbek, T. Orti, G. 2011. POSTER Microsatellite Development and Population Genetics of the Amazonian Peacock Bass, *Cichla temensis* (Perciformes: Cichlidae). Society for the Study of Evolution, Norman, OK.
- Macrander, J.** and Bi, M. 2010. TissueExpress: A Bioinformatic Pipeline to Determine Tissue Specific Gene Expression Levels and High Throughput Sequence Simulation. Society for the Study of Evolution, Portland, OR.
- Macrander J.** and Willis, S. 2010. Population genetics of the Amazonian peacock bass *Cichla orinocensis* (Perciformes: Cichlidae). Biology Graduate Student Association Symposium – UNL, Lincoln, NE.
- *Won 2nd place in Oral Presentations.**

- Macrander J.** and Bi, M. 2010. POSTER TissueExpress: A Bioinformatic Pipeline Using Real EST Data to Simulate 454 Sequencing. Biology Graduate Student Association Symposium – UNL, Lincoln, NE.
- Macrander, J.**, Willis, S., Gibson, S., Hrbek, T., Orti, G. 2009. POSTER Construction and Screening of Microsatellite Library for Five Species of Amazon *Cichla*. Midwest Ecology and Evolution Conference, Lincoln, NE
- Macrander, J.** and Orti, G. 2009. POSTER Integrating EST's and High-Throughput sequencing to Identify Orthologous Loci for Phylogenomic Analysis: A Case Study among Basal Ray-Finned Fishes (Actinopterygii), Biotechnology and Bioinformatics Symposium, Lincoln NE ***Won Best Poster**
- Macrander, J.**, Li, C. Bessert, M., Orti, G. 2007. POSTER Phylogeography and Conservation Genetics of the Plains Topminnow (*Fundulus sciadicus*) in Nebraska and Missouri Joint Meeting of Ichthyologists and Herpetologists, St. Louis MO.

Mentoring and Awards

Graduate Students Mentored

- Jyothirmayi Panda (Venomix package for toxin gene identification; MS-CS 2017) UNCC

Undergraduate Students Mentored

- Edwin Rice (Toxin gene identification from transcriptome data sets; B.S. 2016) OSU
- Annelise Del Rio (Evolution of stress genes in sea anemones; B.S. 2015) OSU
- Yang Lu (Bioinformatic methods with sea anemone transcriptomes; B.S. 2013) OSU
- Joshua Allison (Population genetics of Patagonia fishes; B.S. 2012) UNL
- Shane Gibson (Microsatellite development for *Cichla*, B.S. 2010) UNL

Outstanding Research Mentor Award - OSU (2015) *Recognition for the leadership and support provided to undergraduate students.*

RUMBA Undergraduate Research Program Mentor (AU 2012 – SP 2014) *Undergraduate student mentoring through RUMBA (Research for Undergraduates: adventures in Mathematical Biology and its Applications). Under my guidance, students take part in independent research to investigate evolutionary processes shaping sea anemone diversity.*

Teaching Experience and Professional Development

Instructor of Record: Upper Level Undergraduate and Graduate Courses:

- EEOB 881.05 – **Seminar on Evolution: PERL Programming** (2012^{WI})
Developed lecture and lab components providing students an introduction to basics of the command line, as well as how to write and execute scripts written in the programming language PERL in order to manipulate and analyze next-generation sequence data.

Teaching Assistant: Upper Level Undergraduate Courses:

- EEOB 3301/400 – **Evolution**: Recitations & Assist w/Lecture (2011^{SP WI}, 2012^{SU})
- EEOB 3520 – **Microscopic Anatomy**: Laboratory (2014^{AU})
- EEOB 405.02 – **Diversity and Systematics of Organisms**: Laboratory (2012^{SP})
- EEOB 512 – **Comparative Vertebrate Anatomy**: Laboratory (2011^{AU})
- EEOB 503 – **Introduction to Ecology**: Laboratory and Recitations (2011^{SU})
- BIO 428 (UNL) – **Vertebrate Zoology**: Laboratory (2009^{AU}, 2010^{SP})

As teaching assistant I led two lab sections (EEOB 3520, EEOB 405.02, EEOB 512, BIO 428), three recitations (EEOB 3301/400), or both lab and recitation sections (EEOB 503), provided guest lectures, developed recitation activities, and wrote clicker questions using Bloom's taxonomy of cognitive domain.

Teaching Assistant: Introductory Undergraduate Courses:

- BIO 1101 – **Introduction to Biology**: Laboratory & Assisted with Lecture (2013^{SP}, 2016^{AU})
- BIO 1102 – **Human Biology**: Recitations (2012^{AU})
- BIO 101 (UNL) – **Introduction to Biology**: Laboratory (2008^{AU}, 2009^{SP}, 2010^{AU})

As a teaching assistant I led two lab sections (BIO 1101, BIO101) or three recitation sections (BIO 1102). Designed course material around student centered learning using discussions, clickers, concept maps, and online quizzes.

SOTL Professional Development and Instruction

- Interdisciplinary Specialization in College and University Teaching (2011 – 2016) *Theories and practice of university-level teaching, both in general and discipline specific courses that enable a reflective and scholarly understanding university pedagogy.*
- Teaching Orientation Facilitator Learning Community (TOFLC) - Technology (2014 – 2015) *Improve the overall TA training experience, specifically focusing on curriculum, personnel, technology, and community building.*
- UCAT Teaching Orientation Facilitator (2012 – 2014) *Provide incoming graduate students with an introduction to concepts in teaching and learning, as well as resources that are available at Ohio State. The event involves 400+ graduate students from across campus from various departments. (<http://ucat.osu.edu/>)*

Diversity in STEM

Diversity and Implicit Bias Awareness Certification (2016)

Received training to enhance self-awareness, advocacy, and leadership competencies as they relate to problems of underrepresentation groups and implicit bias.

OSU Women in STEM Panel Discussion, co-organizer (August 27, 2015)

One of three graduate students that organized a panel discussion regarding potential pitfalls and roadblocks that women encounter when pursuing a career in STEM. Over 75 faculty, graduate students, undergraduates, and staff participated. <http://u.osu.edu/wstem/>

Diversity Committee, Graduate Student Representative (2015 – 2016)

- Develop lesson plan for workshops dedicated to enriching diversity in STEM.
- Update the departmental diversity statement and create a template for syllabi.
- Identify bridge programs to link research opportunities with underrepresented groups at regional campuses and community colleges.

Service and Outreach

Reviewer

- *Toxins, Marine Drugs, PeerJ, Marine Biology, Toxicon,*
- Panelist for NASA's exobiology program (October 2016)

Museum Open House *Museum open to public, DNA Lab demonstrations in for 2700 + guests:*

- Transcription and Translation. Using interlocking baby blocks to go this process (2015)
- Who did it!? Gel electrophoresis to match DNA from a crime scene with suspects. (2014)
- How many chromosomes? Guessing game with species and chromosome numbers (2013)
- Freeze and smash! Extracting DNA from using liquid nitrogen (2012).
- DNA at home. DNA extraction demonstration using household items (2011).

District 9 Science Day

- Science Fair Judge (2013 – 2015)
- Assisted with Roots and Shoots concession stand fundraiser (2015)

Zane State College Collaboration, (2013 – 2015)

Assisted with the design and implementation of a lab activity which introduces students to gel electrophoresis in a simulated forensics case study by genotyping human DNA.

Selective Workshops and Training

SciFund Challenge Outreach Course (2015)

Online outreach training class for scientists led by Jai Ranganathan, the director and co-founder of SciFund, a nonprofit established to empower scientists in their outreach and research using crowdfunded support to make a more science engaged world.

Practical Computing for Biologists (2015), Friday Harbor Marine Lab, WA

Using the Practical Computing for Biologists book as a guide, the authors (Steve Haddock and Casey Dunn) provided a framework for accessing and implementing a variety of new tools that have emerged since the books initial publication.

NESCent (NSF) Animal Venom (2014), Raleigh NC

One of four graduate students selected to attend a conference which aimed at synthesizing how we approach venom evolution with a phylogenetic perspective

Professional References

Dr. Adam Reitzel, University of North Carolina at Charlotte
Assistant Professor of Biological Sciences

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Dr. Meg Daly, The Ohio State University
Professor of Evolution, Ecology, and Organismal Biology.
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