

Education and Training

Post-doctoral Fellow

Indiana University (2014-present)
Department of Biology
Advisor: Dr. Armin Moczek

NSF Post-doctoral Fellow

North Carolina State University (2011-2013)
Department of Molecular Biomedical Science
Advisor: Dr. Nanette Nascone-Yoder

University of South Florida, Tampa (2011)
Department of Integrative Biology
Advisor: Dr. Lynn Martin

Ph.D. University of North Carolina, Chapel Hill (2005-2010)
Department of Biology
Advisor: Dr. David W. Pfennig

B.S. University of California, Davis (2001-2004)
Department of Evolution and Ecology

Publications

In review, revisions or prep

Ledón-Rettig, C.C. and Moczek, A.P. (in review). The transcriptomic basis of tissue- and nutrition-dependent sexual dimorphism in the beetle *Onthophagus taurus*.

Published

**Co-First Authors*

Gilbert S.F, Bosch T.C.G, **Ledón-Rettig, C.C.** 2015. Ecological Developmental Evolutionary Biology: Developmental symbiosis and developmental plasticity as evolutionary agents. *Nature Reviews Genetics*. doi: 10.1038/nrg3982

Moczek A.P., Sears, K.E., Stollewerk A., Wittkopp P.J., Diggie P., Dworkin I., **Ledón-Rettig C.C.**, Matus D.Q., Roth S., Abouheif E., Brown F.D., Chiu C., Cohen C.S., De Tomaso A.W., Gilbert S.F., Hall B., Love A., Lyons D.C., Sanger T., Smith J., Specht C., Vallejo-Marin M., Extavour C.G. 2015. The significance and scope of evolutionary developmental biology: a vision for the 21st century. *Evolution and Development* 17:148-159

Amin N.M., Womble M., **Ledon-Rettig C.C.**, Hull M., Dickinson, A., Nascone-Yoder, N. 2015. Budgett's frog (*Lepidobatrachus laevis*): A new amphibian embryo for developmental biology. *Developmental biology*. 405(2), 291-303.

Ledón-Rettig C.C., Chunco A.J., Pfennig D.W., Dworkin I. 2014 Cryptic genetic variation in natural populations: A predictive framework. *Integrative and Comparative Biology*. 54(5), 783-793.

Ledón-Rettig C.C. 2013. Ecological Epigenetics: An introduction to the symposium *Integrative and Comparative Biology*. 53, 307-318

*Bloom S., ***Ledón-Rettig C.C.**, Infante C., Everly A., Hanken J., Nascone-Yoder N. 2013. Developmental origins of novel gut morphology in frogs. *Evolution and Development*. 15:3, 213-223 (featured in Science Daily, <http://www.sciencedaily.com/releases/2013/05/130508131848.htm>)

Ledón-Rettig, C.C. and Pfennig, D.W. 2012. Antipredator behavior promotes diversification of feeding strategies. *Integrative and Comparative Biology*. 52, 53-63

Ledón-Rettig, C.C., Richards, C.L., and Martin, L.B. 2012. Epigenetics for behavioral ecologists. *Behavioral Ecology*. 24, 311-324 (Invited review)

Ledón-Rettig, C.C., Richards, C.L., and Martin, L.B. 2012. A place for behavior in ecological epigenetics. *Behavioral Ecology*. 24, 329-330 (Invited commentary)

Ledón-Rettig, C.C. and Pfennig, D.W. Emerging model systems in eco-evo-devo: the environmentally responsive spadefoot toad. 2011. *Evolution and Development*. 13, 391-400

Moczek, A., Sultan, S., Foster, S., **Ledón-Rettig, C.C.**, Dworkin, I., Nijhout, F., Abouheif, E. and Pfennig, D.W. The role of developmental plasticity in evolutionary innovation. 2011. *Proceedings of the Royal Society, London B*. 278, 2705-2713

Ledón-Rettig, C.C., Pfennig, D. W. and Crespi, E. J. 2010 Diet and hormones reveal cryptic genetic variation: implications for the evolution of novel feeding strategies. *Proceedings of the Royal Society, London B*. 277, 2569-3578 (featured in Nature Research Highlights, vol. 466 pg 11)

Buchholz, D.R., Hollar, A.R. and **Ledón-Rettig, C.C.** 2010. *Scaphiopus couchii* (Couch's spadefoot). Developmental morphology. *Herpetological Review*. 41, 480

Ledón-Rettig, C.C., Pfennig, D.W. and Crespi, E.J. 2009. Stress hormones and the fitness consequences associated with the transition to a novel diet in larval amphibians. *Journal of Experimental Biology*. 212, 3743-3750

Pfennig, D.W. and **Ledón-Rettig, C.C.** 2009. "The Flexible Organism" Rev. of Ecological Developmental Biology: Integrating Epigenetics, Medicine, and Evolution., by Scott F. Gilbert and David Epel. *Science*. 325, 268-269

Ledón-Rettig, C.C., Pfennig, D.W. and Nascone-Yoder, N. 2008. Ancestral plasticity and the potential for genetic accommodation in larval amphibians: Implications for the evolution of novel feeding strategies. *Evolution and Development*. 10, 316-325

Awards and Honors

Major Funding

- NSF Postdoctoral Research Fellowship (3 year fellowship) 2011-2014
- NSF Graduate Research Fellowship (3 year fellowship) 2006-2009
- University Merit Scholarship, UNC Chapel Hill (1 year fellowship) 2005-2006

Other

- Indiana University Provost's Travel Award for Women in Science 2015
- Society for the Study of Evolution Travel Grant (\$1,000) 2010
- Elected Student Speaker, Department of Biology, Annual Symposium and Retreat, UNC Chapel Hill 2009
- Journal of Experimental Biology Travel Grant (\$1,300) 2009
- Sigma Xi Grants in Aid of Research (\$1,000) 2007
- Undergraduate Diversity: Society for the Study of Evolution Program (competitive) 2004

Organized Symposia

- Organized (with A. Liebl, A. Schrey, C. Richards & A. Moczek) symposium "Ecological Epigenetics"; sponsored by the Society for Integrative Biology (featured in Nature News, doi:10.1038/nature.2013.12179) January 2013

Invited Symposia

- Invited participant in the symposium "Adaptation or Developmental Constraint? Uniting Evolutionary Theory and Empirical Studies of Phenotypic Plasticity"; sponsored by the Society for Integrative and Comparative Biology January 2014
- Invited participant in the symposium "Development, Behaviour and Evolution"; sponsored by the Congress for the European Society for Evolutionary Biology August 2013
- Invited participant in the symposium "Phenotypic Plasticity: Variation, Alteration and Speciation"; sponsored by Lund University November 2012
- Invited participant in the symposium "Evolution of polyphenisms: Pathways to innovation and diversification"; sponsored by the Society for Integrative and Comparative Biology January 2011

Invited Seminars

- Duke University Behavioral, Population and Community Ecology Seminar Series - *Altered developmental programs underlying the novel gut phenotypes in cannibalistic anuran larvae* 2013
- Lehigh University, Biological Sciences Departmental Seminar – *The developmental origins of a novel gut morphology in anuran larvae* 2013
- Georgia Institute of Technology, Biology Departmental Seminar - *Ecological Developmental Biology: A critical field for a changing world* 2012
- University of South Florida, Tampa, Integrative Biology Departmental Seminar - *Phenotypic plasticity's role in the origins and diversification of feeding strategies* 2011
- University of North Carolina, Chapel Hill, Biology Department Annual Symposium and Retreat, Elected Student Speaker - *Stress hormones and the evolution of a novel feeding strategy* 2010

Professional Presentations

- **Ledón-Rettig C.C.** & Moczek (poster) The transcriptional basis of tissue- and nutrition-dependent sexual dimorphism in the beetle *Onthophagus taurus*. Inaugural Meeting for the Pan-American Society for Evolutionary Developmental Biology Summer 2015
- **Ledón-Rettig C.C.**, Infante C., Hanken J., Nascone-Yoder NM. (talk) Altering retinoic acid and thyroid hormone signaling produces integrated modifications in gut morphology and physiology. Society for the Study of Evolution Meeting, 2013 Summer 2013
- Crespi E.J., Warne R.W., **Ledón-Rettig C.C.** (talk) Integrating stress physiology with quantitative evolutionary models to predict population responses to environmental change: An amphibian perspective. SICB Meeting, 2013 Winter 2013
- **Ledón-Rettig C.C.**, Bloom S., Infante C., Everly A., Hanken J., Nascone-Yoder N. Developmental origins of a novel gut phenotype in frogs. (talk) 1st Joint Congress on Evolutionary Biology Summer 2012
- Bloom S., Infante C., **Ledón-Rettig C.C.**, Everly A., Hanken J., Nascone-Yoder N. (poster) Developmental origins of novel gut phenotypes in anuran larvae. Latin American Society of Spring 2012

- Developmental Biology Meeting, 2012
- **Ledón-Rettig, C.C.**, Pfennig, D.W., Crespi, E.J. (talk) Phenotypic plasticity's role in the origins of novel feeding strategies. Society of Comparative and Integrative Biology Meeting, 2011 Winter 2011
 - **Ledón-Rettig, C.C.**, Pfennig, D.W., Crespi, E.J. (talk) Diet and hormones reveal cryptic genetic variation: Implications for the evolution of novel feeding strategies. Society for the Study of Evolution/ASN/SSB Meeting Summer 2010
 - **Ledón-Rettig, C.C.**, Pfennig, D.W., Crespi, E.J. (talk) Environmental stress and the evolution of novel feeding strategies. European Society for Evolutionary Biology, 2009 Summer 2009
 - **Ledón-Rettig, C.C.**, Pfennig, D.W., Crespi, E.J. (poster) Hormonal regulation and the evolution of a novel feeding strategy. Society of Comparative and Integrative Biology Meeting, 2009 Winter 2009
 - **Ledón-Rettig, C.C.**, Pfennig, D.W., Nascone-Yoder, N. (poster) Ancestral variation and genetic accommodation: Implications for the evolution of a novel feeding strategy. Society of Comparative and Integrative Biology Meeting, 2008 Winter 2008
 - **Ledón-Rettig, C.C.**, Pfennig, D.W., Nascone-Yoder, N. (poster) The ontogeny of developmental plasticity in amphibians. Society of Comparative and Integrative Biology Meeting, 2007 Winter 2007
 - **Ledón-Rettig, C.C.**, Pfennig, D.W., Nascone-Yoder, N. (poster) The ontogeny of developmental plasticity in amphibians. IGERT Symposium: Evolution, Development and Genomics Fall 2006
 - **Ledón-Rettig, C.C.** The effects of isolation-by-distance and phenology on population structure in a vernal pool annual plant. (poster). Society for the Study of Evolution Meeting, 2003 Spring 2003

Teaching and Mentoring Experience

Teaching:

I have been a professor for the following courses,

- UNC Chapel Hill, Cellular and Developmental Biology (Biol 205) Summer, 2014
- UNC Chapel Hill, Evolutionary Mechanisms (471) Summer, 2014

Guest Lectures

- Indiana University, Jim Holland Summer Enrichment Program Invited Lecture – Evolutionary Medicine Summer 2015
- UNC Chapel Hill, Development (Biol 443) - Ecological Development Fall 2013
- UNC Chapel Hill, Development (Biol 443) - Morphogenesis of Epithelial Tubes Fall 2013
- NC State University, Environmental Toxicology (VMB 992) – Evolutionary Development: Mechanisms of Macroevolution Fall 2012
- UNC Chapel Hill, Evolution and Development (Biol 514) - Epigenetic mechanisms. Fall 2010
- UNC Chapel Hill, Evolution and Development (Biol 514) - Levels of Selection Fall 2010
- Vassar College, Environmental Physiology/Endocrinology of Animals (Biol 380) - Hormonal regulation and feeding strategies Fall 2008

I have been a teaching assistant for the following courses,

- UNC Chapel Hill, Modes of Inquiry: Set-up and maintained website for an interdisciplinary seminar series, and led class discussions. Fall, 2009
Spring, 2010
- UNC Chapel Hill, Evolutionary Mechanisms (471): Designed syllabus and planned class activities. Designed a lab project for undergraduates that involved retrieving sequences from GenBank, aligning them with ClustalW, and creating phylogenies to test alternate hypotheses about character evolution. Spring, 2008
- UNC Chapel Hill, Ecology and Evolution (201): Assisted with writing syllabus, planning recitations, and leading field trips to Duke Forest/Battlefield Park. Designed both final writing project and corresponding rubric. Fall, 2007
Spring, 2009
- UNC Chapel Hill, Human Physiology and Anatomy (251) Summer, 2007

Mentoring

- Undergraduate Diversity at Evolution Program Mentor, SSE/SSB/ASN meeting, Summer 2013
- My undergraduate student researchers have been involved/trained in one or more of the following: experimental design (reading relevant papers/executing design), statistics, dissection, image analysis (using NIH's ImageJ), behavioral analysis (using JWatcher), immunohistochemistry, radioimmunoassay, enzyme immunoassay, DNA & RNA extractions, primer design, cloning, and gel electrophoresis

Michelle Landstrom (UNC undergraduate)	Summer 2006
Annemarie Nagle (UNC undergraduate)	Summer 2006
Samir Patel (UNC undergraduate)	Spring 2007
Emily Graham (UNC undergraduate)	Spring 2008
Stuart Glass (UNC undergraduate)	Summer 2008
Gabriela Bustamante (Vassar undergraduate)	Fall 2008
Kristen Butler (UNC undergraduate)	Spring 2009
Jennie Nwokoye (USF undergraduate)	Spring and Summer 2011
Cristina Ruiz Lorenzo (USF undergraduate)	Spring and Summer 2011
Holly Kilvitis (USF undergraduate)	Spring and Summer 2011
Michael Wyngarden (NSCU undergraduate)	Spring 2012
Hannah Jones (NCSU undergraduate)	Summer 2013
Madison Black (IU undergraduate)	Fall 2015

Outreach Service

- *Girls Incorporated*: I am involved with a partnership between Marble Hill Farm (Bloomington, IN) and a nonprofit agency, Girls Inc. The agency serves ~550 girls between the ages of 6 and 18 with the aim of helping girls overcome gender inequities by bringing them research-driven programs in an all-girls environment. In our partnership, groups of 12 girls visit the farm for three days to devise research projects that incorporate observational skills, hypothesis testing, and research presentation.
- K-12 outreach: I routinely visit public and private K-12 schools to deliver science modules developed by my host lab. These modules match core objectives of the Indiana Science Teaching Standards and at the same time focus on the integration of ecology, development and evolution.

Professional Service

Reviewer for: *Evolution, Trends in Evolution and Ecology, Proceedings of the Royal Society B, Evolution & Development, Functional Ecology, Genetical Research International, Animal Behavior, Ethology, Current Zoology, Journal of Morphology*

Panel Participant: National Science Foundation, Integrative Organismal Systems

Departmental Service

- UNC Biology Graduate Student Association: Ecology Representative, 2005-2006
- UNC Biology Graduate Student Association: Treasurer, 2006-2007