# ERIC M. ERKENBRACK

Yale University
850 West Campus Dr, ISTC 112
West Haven, CT 06516
(203) - 737 3092 | eric.erkenbrack@yale.edu
Website: *embryos-and-evolution.com*


## EDUCATION

2008 – 2016 Ph.D., Biology, California Institute of Technology, Pasadena, CA, USA
2005 – 2008 B.S., Biology, B.A. Philosophy, *magna cum laude,* Tufts University, Medford, MA, USA
2003 – 2005 Normandale Community College, Bloomington, MN, USA

## RESEARCH EXPERIENCE

2015 – **Post-doctoral associate**, Yale University
*Advisor:* Günter P Wagner
*Topic:* Development and evolution of gene regulatory networks in mammalian placentation
*Species*: opossum (*Monodelphis domestica*), human and opossum endometrial fibroblast cell culture, HeLa

2008 – 2016 **Ph.D. Candidate**, California Institute of Technology
*Advisor:* Eric H Davidson
*Topic:* Evolution of developmental gene regulatory networks in echinoids
*Species:* cidaroid urchins *(Eucidaris tribuloides, Prionocidaris baculosa*), euechinoid urchins *(Strongylocentrotus purpuratus, Lytechinus variegatus*)

2007 – 2008 **Senior Honors Thesis Research**, Tufts University
*Advisor:* Colin M Orians
*Topic:* Induced genetic and whole-plant resource defenses in *Solanaceae* in response to herbivory cues
*Species: Solanum lycopersicum, Nicotiana tabacum, Lymantria dispar*

2006 – 2007 **DAAD Undergraduate Research Fellow,** Universität Tübingen, Tübingen, Germany
*Advisor:* Mika T Tarkka, Rüdiger Hampp
*Topic:* Isolation and functional analysis of helper bacteria in the rhizosphere of a *Picea abies* forest stand
*Species: Amanita muscaria, Picea abies, Actinomyces spp.*

2006 – 2006 **DAAD Summer Fellow,** Max Planck Institute for Plant Breeding Research
*Advisor:* Moritz Nowack, Arp Schnittger
*Topic:* Cyclin-dependent kinases (CDKs), the cell cycle, and fertilization
*Species: Arabidopsis thaliana*

2005 – 2005 **NSF REU Summer Fellow**, Tufts University
*Advisor:* Colin M Orians
*Topic:* Biogeography and forest ecology of urban, old- and new-growth tree stands near Medford, MA, USA

## TEACHING EXPERIENCE

2010 Teaching Assistant, Bi 182: Developmental Gene Regulation and Evolution of Animals, Prof. Eric H Davidson

2011 Teaching Assistant, Bi 204: Evolution of the Animal Body Plan, Prof. Eric H Davidson

2012 Teaching Assistant, Bi 182: Developmental Gene Regulation and Evolution of Animals, Prof. Eric H Davidson

2013 Teaching Assistant, Bi 204: Evolution of the Animal Body Plan, Prof. Eric H Davidson

## HONORS & AWARDS

2007 Thomas Harrison and Emily Leonard Carmichael Prize, Department of Biology, Tufts University

2006 DAAD Undergraduate Research Fellow, University of Tübingen, Germany

2006 DAAD Summer Research Fellow, Max Planck Institute for Plant Breeding Research

2005 NSF REU Summer Research Fellow, Tufts University

## PRESENTATIONS

2016 Embryos and ancestors: Reconstructing gene regulatory networks and embryonic development in ancestral echinoids. **Invited Talk.** Geological Society of America. Denver, USA.

2016 Comparative analysis of global gene regulatory network deployment reveal tempo and mode of alterations to developmental gene regulatory networks in echinoids. **Poster.** Society of Developmental Biology. Boston, USA.

2014 Delta-Notch signaling and HesC mediate the spatial confinement of the skeletogenic-specific regulatory factor *alx1* to micromere-descendants in *Eucidaris tribuloides*. Dev Biology of the Sea Urchin XXII. **Talk.** Woods Hole, USA.

2013 Understanding how development and morphology are encoded in the genome: Early deployment of gene regulatory networks in two distantly-related sea urchins is indicative of major genomic rewiring. **Poster.** Society of Molecular Biology and Evolution. Chicago, USA.

2012 Embryonic development of the slate pencil urchin *Eucidaris tribuloides*: Re-booting research on this interesting cidaroid. De Biology of the Sea Urchin XXI. **Talk.** Woods Hole, USA.

## PUBLICATIONS

2016 *11* **Erkenbrack EM**, Davidson EH, Peter IS. Conserved regulatory state expression controlled by divergent developmental gene regulatory network circuits in echinoids. *In preparation.*

2016 *10* **Erkenbrack EM**. Divergence of ectodermal and mesodermal gene regulatory network linkages in early development of sea urchins. *Proceedings of the National Academy of Sciences U S A* 113(46): E7202-E7211.

2016 *9* Stewart TA, Griffith O, Criscuolo E, Dharani H, Sanger T, **Erkenbrack EM**. Procedure for incubation and extraction of embryos from eggs of the green anole, *Anolis carolensis. J. Vis. Exp.: In Review*.

2016 *8* Thompson JR, **Erkenbrack EM**, Hinman VF, Zheng M, Petsios E, Bottjer DJ. Paleogenomics of echinoids reveals an ancient origin for the double-negative specification of micromeres in sea urchins. *Proceedings of the National Academy of Sciences U S A:.In Review*.

2016 *7* Nnamani MC, Ganguly S, **Erkenbrack EM**, Lynch VJ, Mizoue LS, Tong Y, Darling HL, Fuxreiter M, Meiler J, Wagner GP. A derived allosteric switch underlies the evolution of conditional cooperativity between HOXA11 and FOXO1. *Cell Reports* 15(10): 2097-2108.

2016 *6* **Erkenbrack EM**. Evolution of developmental gene regulatory networks in echinoids. California Institute of Technology Thesis. Defended: 7 April 2016.

2016 *5* **Erkenbrack EM**, Ako-Asare K, Miller E, Tekelenburg S, Thompson JR, Romano L. Ancestral state reconstruction by comparative analysis of a GRN kernel operating in echinoderms. *Development Genes & Evolution* 226(1): 37-45.

2015 *4* Thompson JR, Petsios E, Davidson EH, **Erkenbrack EM**, Gao F, Bottjer DJ. Reorganization of sea urchin gene regulatory networks at least 268 million years ago as revealed by oldest fossil cidaroid echinoid. *Scientific Reports* 5: 15541.

2015 *3* **Erkenbrack EM,** Davidson EH. Evolutionary rewiring of gene regulatory network linkages at divergence of the echinoid subclasses. *Proceedings of the National Academy of Sciences U S A* 112: E4075-E4084.

2015 *2* Gao F, Thompson JR, Petsios E, **Erkenbrack EM**, Moats RA, Bottjer DJ, Davidson EH. Juvenile skeletogenesis in anciently diverged sea urchin clades. *Developmental Biology* 400: 148-158.

2012 *1* Schrey S, **Erkenbrack EM**, Fruh E, Fengler S, Hommel K, Horlacher N, Schulz D, Ecke M, Kulik A, Fiedler H-P, Hampp R, Tarkka M. Production of fungal and bacterial growth modulating secondary metabolites is widespread among mycorrhiza-associated streptomycetes. *BMC Microbiology* 12: 164-178.