

Michael E. Alfaro

CURRICULUM VITAE

ADDRESS

Associate Professor
Ecology and Evolutionary Biology
University of California
Los Angeles, CA 90095

Phone: (310) 794-5019
FAX: (310) 825-1978
email: michaelalfaro@ucla.edu
web: <http://pandorasboxfish.squarespace.com/>

EDUCATION

- 2000 Ph.D., Evolutionary Biology, University of Chicago. Dissertation title: "Systematics and the evolution of aquatic prey capture in thamnophiine snakes (Natricinae: Colubridae)."
- 1995 M.A., Biology, Humboldt State University, Arcata, CA. Thesis title: "Morphology of the dinosaurian hyoid apparatus."
- 1989 B.A., Dramatic Arts, University of California, Davis, CA.

RESEARCH INTERESTS

The central goal of my research program is to understand the factors that govern the evolutionary dynamics of organismal diversification. How can we explain the uneven patterns of morphological diversity and species richness across the fish Tree of Life? Where is macroevolutionary theory adequate to explain diversity patterns and where must new models and methods be developed? Does morphological diversity always signal mechanical, functional, or ecological diversity? To address these questions, I work largely on marine fishes. My research approach is interdisciplinary and quantitative and crosses traditional boundaries among evolutionary morphology, molecular phylogenetics, and theoretical evolution. I identify and quantify organismal diversity using morphological and functional morphological techniques; construct evolutionary trees and test evolutionary hypotheses using phylogenetic statistical methods; and use models of trait evolution to explore form-function dynamics.

PROFESSIONAL POSITIONS

- 2010-present Associate Professor, Ecology and Evolutionary Biology, UCLA
- 2008-2010 Assistant Professor, Ecology and Evolutionary Biology, UCLA
- 2005-2008 Assistant Professor, Animal Molecular Phylogenetics, Washington State University
- 2003-2004 Postdoctoral Researcher, Huelsenbeck Lab, University of California, San Diego
- 2001-2003 Phylogenetics Postdoctoral Fellow, University of California, Davis
- 2001-present Research Associate, FMNH
- 2000-2001 Postdoctoral Researcher, Field Museum of Natural History, Chicago.

RESEARCH GRANTS, FELLOWSHIPS, AND AWARDS

- 2011 NSF REU Supplement to DEB 686195 Tempo and mode of vertebrate diversification. \$7500.
- 2010 NSF DEB 6861953 Collaborative Research: Tempo and mode of vertebrate diversification. PI. \$247,000.
- 2009 NSF DEB 6701648 Dynamics of diversification in tetraodontiform fishes. PI with Co-PI Francesco Santini (UCLA). \$450,000.

- 2009 NSF DEB 0910309 Dissertation Research: Tempo and mode of diversification in megophryid frogs. PI with Co-PI Barbara Banbury (Washington State University). \$14920
- 2009 UCLA Faculty Diversity and Development Award
- 2009 NESCent Short Term Visitors Award
- 2008 NSF IOS 0819009: The evolution of cranial forms in anguilliform fishes: Does extreme biting promote or constrain morphological diversity? Co-PI with PI Rita Mehta (UC Davis) and Co-PI Peter Wainwright (UC Davis). UCLA portion \$104,000.
- 2008 NSF BCS 0610451: Comparative phylogeography of capuchins, squirrel monkeys and owl monkeys: effects of body size, social organization, and evolutionary history. Co-PI with PI Jessica Lynch Alfaro (UCLA) and Co-PI Link Olson (University of Alaska, Fairbanks). \$248,450.00
- 2007 NESCent Hackathon in R, Invited Participant
- 2006 WSU Faculty Seed Grant: The influence of genome size evolution on morphological diversification and cladogenesis in tetraodontiform fishes. \$17,800
- 2006 NSF DGE 0549425 IGERT: Model-based Approaches to Biological and Cultural Evolution Co-PI with PI Tim Kohler (WSU) and Co-PI Mike Webster (WSU), Karen Lupo (WSU), Eric Alden Smith (University of Washington) \$3,058,533.00
- 2005 NSF DEB 0445453: Model Averaging and Model Uncertainty in Phylogenetics. Co PI with PI John Huelsenbeck (UCSD) and Co-PI Bret Larget (University of Wisconsin, Madison) \$300,000 (WSU portion \$100,000)
- 2000-2002 Phylogenetics Postdoctoral Fellow, University of California, Davis.
- 2000 NSF IBN-9982815: Motor Control of Vertebrate Feeding: Functional and Evolutionary Perspectives (SICB Symposium, Chicago 2001) \$2500.
- 2000 Honorable Mention, Dwight Davis Award, Society for Integrative and Comparative Biology annual meetings, Atlanta, GA.
- 1999 American Society of Ichthyology and Herpetology Gage Award. Prey Capture in Thamnophiine Snakes. \$500.
- 1999 Society for Integrative and Comparative Biology Grant-in-Aid of Research. Striking in Thamnophiine Snakes. \$600.
- 1998 Academic Information and Technology Grant, University of Chicago. Development of a molecular analysis workstation for the Committee on Evolutionary Biology. \$7000.

- 1998 Grant-in-Aid of Research, Sigma Xi Scientific Research Society. Prey Capture in Thamnophiine Snakes. \$630.
- 1997 Lester Armour Graduate Fellowship, Field Museum of Natural History.
- 1997 Grant-in-Aid of Research, Sigma Xi Scientific Research Society. Molecular Systematics of Thamnophiine Snakes. \$660.
- 1997 AMNH Teddy Roosevelt Research Award. Molecular Systematics of Thamnophiine Snakes. \$750.
- 1997 Partial Tuition Waiver Award, "Molecular Evolution Workshop," Woods Hole Marine Biological Laboratory, Woods Hole, MA.
- 1996 University of Chicago Hinds Fund Awards. Molecular Systematics of Thamnophiine Snakes. \$700. Functional Integration of Feeding and Locomotor Systems in Thamnophiine Snakes: Kinematics of the Feeding Strike. \$660.
- 1996 NSF GER9355032. Molecular Systematics of Thamnophiine Snakes. \$960.

PUBLICATIONS

- 2011 Santana, S. E., Dial, T. O., Eiting, T. P. and **M. E. Alfaro**. Roosting ecology and the evolution of pelage markings in bats. *PLOS*, *accepted*
- 2011 Slater, G. J., L. J. Harmon, D. Wegmann, P. Joyce, L. J. Revell, and **M. E. Alfaro**. Using Approximate Bayesian Computation to fit models of continuous trait evolution to incompletely resolved phylogenetic trees. *Evolution*, *in press*
- 2011 Lynch Alfaro, J. W., L. Matthews, A. H. Boyette, S. J. Macfarlan, K. A. Phillips, T. Falotico, E. Ottoni, M. Verderane, P. Izar, M. Schulte, A. Melin, L. Fedigan, C. Janson, and **M. E. Alfaro**. 2011. Anointing variation across wild capuchin populations: a review of material preferences, bout frequency and anointing sociality in *Cebus* and *Sapajus*. *Am J Primatol*, *in press*
- 2011 Lynch Alfaro, J. W., J. P. Boubli, L. E. Olson, R. E. DiFiori, B. Wilson, G. A. Guitierrez-Espeleta, K. I. Chiou, M. Schulte, S. Neitzel, V. Ross, D. Schwochow, M. Nguyen, I. Farias, C. Janson, and **M. E. Alfaro**. Explosive Pleistocene range expansion leads to widespread Amazonian sympatry between robust and gracile capuchin monkeys. *Journal of Biogeography* *in press*
- 2011 Waltzek, T. B., G. Marty, **M. E. Alfaro**, W. Bennet, M. Haulena, E. Weber, and R. P. Hedrick. 2011. A systemic iridovirus from threespine stickleback (*Gasterosteus aculeatus*) represents a new megalocytivirus species in the family Iridoviridae. *Diseases of Aquatic Organisms*. *in press*
- 2011 Eastman, J. M., **M. E. Alfaro**, P. Joyce, A. L. Hipp, and L. J. Harmon. 2011. A novel comparative method for identifying shifts in the rate of character evolution on trees. *Evolution* **65** (online in advance of publication)

- 2011 Jaffe, A. L., G. J. Slater, and **M. E. Alfaro**. The evolution of island gigantism and body size variation in tortoises and turtles. *Biology Letters* **7**:558-561.
- 2011 Dornburg, A., B. Sidlauskas, F. Santini, L. Sorenson, Near, T. J., and **M. E. Alfaro**. The influence of an innovative locomotor strategy on the phenotypic diversification of triggerfishes (Family: Balistidae). *Evolution* **65**:1912-1926.
- 2011 Brock, C. D., L. J. Harmon, and M. E. Alfaro. Testing for temporal variation in diversification rates when sampling is incomplete and nonrandom. *Syst Biol* **60**:410-419.
- 2011 Huelsenbeck, J. P., **M. E. Alfaro**, and M. A. Suchard. Biologically inspired phylogenetic models strongly outperform the No Common Mechanism model. *Systematic Biology* **60**:225-232.
- 2010 Slater, G. J., S. A. Price, F. Santini, and M. E. Alfaro. Diversity versus disparity and the radiation of modern cetaceans. *Proc Biol Sci* **277**:3097-3104.
- 2010 Rabosky, D. L., and M. E. Alfaro. Evolutionary bangs and whimpers: methodological advances and conceptual frameworks for studying exceptional diversification. *Syst Biol* **59**:615-618.
- 2010 Mehta, R. S., A. B. Ward, M. E. Alfaro, and P. C. Wainwright. 2010. Elongation of the body in eels. *Integr Comp Biol* **50**:1091-1105.
- 2009 Alfaro, M. E., F. Santini, C. Brock, H. Alamillo, A. Dornburg, D. L. Rabosky, G. Carnevale, and L. J. Harmon. 2009. Nine exceptional radiations plus high turnover explain species diversity in jawed vertebrates. *PNAS* **106**:13410-13414.
- 2009 Alfaro, M. E., C. D. Brock, B. L. Banbury, and P. C. Wainwright. Does evolutionary innovation in pharyngeal jaws lead to rapid lineage diversification in labrid fishes? *BMC Evol Biol* **9**:255
- 2009 Santini, F., L. J. Harmon, G. Carnevale, and M. E. Alfaro. Did genome duplication drive the origin of teleosts? A comparative study of diversification in ray-finned fishes. *BMC Evol Biol* **9**
- 2009 S. E. Vincent, M. C. Brandley, A. Herrel, **M. E. Alfaro**. Convergence in trophic morphology and feeding performance among piscivorous natricine snakes. *J Evolution Biol.* **22**:1203-1211
- 2009 T. B. Waltzek, G. O. Kelley, **M. E. Alfaro**, T. Kurobe, A. J. Davison, and R. P. Hedrick. Phylogenetic relationships in the family Alloherpesviridae. *Diseases of Aquatic Organisms* **84**:179-194
- 2008 A. Dornburg, F. Santini, and **M. E. Alfaro**. Influence of model averaging on clade posteriors: An example using the triggerfishes (Balistidae). *Systematic Biology*, **57**:905-919.

- 2008 Collar, D. C., P. C. Wainwright, and **M. E. Alfaro**. 2008. Integrated diversification of locomotion and feeding in labrid fishes. *Biol Lett* 4:84-86.
- 2008 Herrel, A., S. E. Vincent, **M. E. Alfaro**, W. Van, S. B. Vanhooydonck, and D. J. Irschick. 2008. Morphological convergence as a consequence of extreme functional demands: examples from the feeding system of natricine snakes. *J Evolution Biol* 21:1438-1448.
- 2008 Clark, J. R., R. H. Ree, **M. E. Alfaro**, M. G. King, W. L. Wagner, and E. H. Roalson. 2008. A Comparative Study in Ancestral Range Reconstruction Methods: Retracing the Uncertain Histories of Insular Lineages. *Syst Biol* 57:693-707.
- 2008 L. L. Smith, J. L. Fessler, **M. E. Alfaro**, J.T. Streebman, and M.W. Westneat. Phylogenetic relationships and the evolution of regulatory gene sequences in the parrotfishes. *Molecular Phylogenetics and Evolution*. 49:136-152
- 2008 **M. E. Alfaro**, D. R. Karns, H. K. Voris, and B. L. Stuart. Phylogeny, Evolutionary History, and Biogeography of Oriental-Australian Rear-fanged Water Snakes (Colubridae: Homalopsidae) Inferred from Mitochondrial and Nuclear DNA Sequences. *Molecular Phylogenetics and Evolution* 46:576-593
- 2007 A. Storfer, **M. E. Alfaro**, B.J. Ridenhour, J. K. Jancovich, S. G. Mech, M. J. Parris, J. P. Collins. Phylogenetic concordance analysis shows an emerging pathogen is novel and endemic. *Ecology Letters* 10: 1075-1083.
- 2007 **M. E. Alfaro**, C. D. Brock, and F. Santini. Do reefs drive diversification in marine teleosts? Evidence from the pufferfishes and their allies (Order Tetraodontiformes) *Evolution* 61:2104-2126.
- 2006 **M. E. Alfaro** and M.T. Holder. The posterior and the prior in Bayesian phylogenetics. *Annual Review of Ecology, Evolution, and Systematics* 37:19-42
- 2006 **M. E. Alfaro** & J. P. Huelsenbeck. Comparative performance of Bayesian and AIC-based measures of phylogenetic model uncertainty. *Systematic Biology* 55 89-96
- 2005 **M. E. Alfaro**, D. I. Bolnick, and P. C. Wainwright. Evolutionary consequences of a redundant map of morphology to mechanics: an example using the jaws of labrid fishes. *American Naturalist* 165:E140-E154.
- 2005 M. W. Westneat and **M. E. Alfaro**. Phylogenetic relationships and evolutionary history of the reef fish family Labridae. *Mol. Phyl. Evol.* 36:370-390.
- 2005 M. W. Westneat, **M. E. Alfaro**, P. C. Wainwright, D. Bellwood, and J. Fessler. Local phylogenetic divergence and global evolutionary convergence of skull function in reef fishes of the family Labridae. *Proc. Roy. Soc.* 272:1471-2954.
- 2005 P. C. Wainwright, **M. E. Alfaro**, D. I. Bolnick, and C. D. Hulsey. Many-to-one mapping of form to function: a general principle of organismal design? *Integrative and Comparative Biology* 45:256-262.

- 2004 **M. E. Alfaro**, D. R. Karns, H. K. Voris, E. Abernathy, and S. L. Sellins. Phylogeography of *Cerberus* (Serpentes: Homalopsinae): Diversification of a coastal marine snake in Southeast Asia. *Journal of Biogeography* 31:1277-1292.
- 2004 Huelsenbeck, J. H., Larget, B., and **M. E. Alfaro**. Bayesian phylogenetic model selection using reversible jump Markov chain Monte Carlo. *Molecular Biology and Evolution* 21:1123-1133.
- 2004 K. D. Clements, **M. E. Alfaro**, J. Fessler and M. W. Westneat. Relationships of the Temperate Australasian Labrid Fish Tribe Odacini (Perciformes: Teleostei). *Molecular Phylogenetics and Evolution* 32:575-587
- 2004 **M. E. Alfaro**, D. I. Bolnick, P. C. Wainwright. Evolutionary dynamics of complex biomechanical systems: an example using the four-bar. *Evolution* 58:495-503
- 2003 **M. E. Alfaro**. Sweeping and striking: a kinematic study of the trunk during prey capture in three thamnophiine snakes. *Journal of Experimental Biology*. 206:2381-2392.
- 2003 **M. E. Alfaro** S. Zoller, and F. Lutzoni. Bayes or bootstrap? A simulation study comparing the performance of Bayesian Markov chain Monte Carlo sampling and bootstrapping in assessing phylogenetic confidence. *Molecular Biology and Evolution*. 20:255-266
- Recognized in the 2005 Editor's report as the most cited paper in Molecular Biology and Evolution for 2003. (This paper has now been cited 287 times).***
- 2002 H. K. Voris, **M. E. Alfaro**, D. R. Karns, E. Loomis, J. Murphy, L. Starnes, and E. Thompson. Phylogenetic relationships of Southeast Asian Water snakes (Homalopsinae) inferred from mitochondrial DNA sequences. *Copeia* 2002:906-915.
- 2002 **M. E. Alfaro**. Forward attack modes of aquatic feeding garter snakes: a comparison of specialists and generalists. *Functional Ecology* 16:204-215.
- 2002 J. T. Streebman, **M. E. Alfaro**, M. W. Westneat, D. R. Bellwood, and S. A. Karl. Evolutionary history of the parrotfishes: biogeography, ecomorphology, and comparative diversity. *Evolution* 56:961-971.
- 2001 **M. E. Alfaro**, and S. J. Arnold. Molecular systematics and evolution of *Regina* and the thamnophiine snakes. *Molecular Phylogenetics and Evolution* 16:408-423.
- 2001 **M. E. Alfaro**, J. Janovetz, and M. W. Westneat. Motor control across trophic strategies: variability and constraint in the feeding system of biting and suction feeding fishes. *American Zoologist* 41:1266-1279.
- 2001 **M. E. Alfaro**, A. Herrel. Major issues of feeding motor control in vertebrates. *American Zoologist* 41:1243-1247.

- 1999 **M. E. Alfaro** and M. W. Westneat. Motor patterns of herbivorous feeding: Electromyographic analysis of biting in the parrotfishes *Scarus iseri* and *Cetoscarus bicolor*. *Brain, Behavior and Evolution*. 54:205-222.

INVITED REVIEWS AND BOOK CHAPTERS

- 2011 Alfaro, M. E. Key Evolutionary Innovations. Princeton Guide to Evolutionary Biology.
- 2010 Alfaro, M., and F. Santini.. Evolutionary biology: A flourishing of fish forms. *Nature* 464:840-842.

PUBLICATIONS IN MANUSCRIPT

- in review Rabosky, D. L., Slater, G. J. and **M. E. Alfaro**, Clade age and species richness are decoupled across the Eukaryotic tree of life. *PNAS*.
- in review Reece, J. S., Mehta, R., **Alfaro, M. E.**, Wainwright, P.C., and D. C. Collar. Multiple ways to crack a shell: variable morphological responses to durophagy. *AmNat*
- in review Walker, J. A., **Alfaro, M.E.** and C. J. Fulton. Body fineness ratio predicts endurance swimming performance in fishes swimming with median or pectoral fins but not with undulating body. *J. Exp. Biol.*
- in review Santana, S. E., Lynch Alfaro, J. W. and **M. E. Alfaro**. Adaptive evolution of facial color patterns in Neotropical primates. *Proc Roy Sci*

PUBLISHED ABSTRACTS

- 2009 **Alfaro, ME**, Harmon, LJ, Carnevale, G, Santini, F. Did genome duplication spawn the teleost radiation? Evidence from analysis of actinopterygian diversification rates. *Integr. Comp. Biol.*, February 2009; 49
- 2009 Santini, F. Carnvale, G., Harmon, KJ, **ME Alfaro**. Explaining patterns of diversity within ray-finned fishes. *Integr. Comp. Biol.*, February 2009; 49
- 2009 Dornburg, A, Sidlauskas, BL, Sorenson, L, Santini, F, **ME Alfaro** Morphological and mechanical patterns of triggerfish fins. *Integr. Comp. Biol.*, February 2009; 49
- 2009 Mehta, RS, **Alfaro, ME**, PC Wainwright. Cranial diversity in Anguilliform fishes: does morphological disparity lead to lower levels of modular integration? *Integr. Comp. Biol.*, February 2009; 49
- 2008 O'Meara, Brian, **Alfaro, ME**, Bell, C, Bolker, B, Butler, MCowan, P, de Vienne, D, Desper, R, Felsenstein, J, Harmon, L, Heibl1, C, Hipp, A, Hunt, G, Jombart, T, Kembel, S, Lapp, H, Loarie, S, Maddison, W, Midford, P, Orme, D, Paradis, E, Price, S, Rabosky, D, Sidlauskas, B, Smith, S, Swofford, D, Vision, T, Waddell, P, Zanne1, A and D. Zwickl. Comparative methods in R Hackathon. *Nature Preceedings*.
- 2007 **M. E. Alfaro**, D. C. Collar, and P. C. Wainwright Ubiquity of many-to-one mapping in functional traits: examples and evolutionary implications. *Integr. Comp. Biol.*, February 2009; 47
- 2007 A. Dornburg and **M. E. Alfaro**. Model averaged phylogenetic inference of triggerfishes (Family Balistidae). *Integr. Comp. Biol.*, February 2009; 47

- 2007 B. Banbury and **M. E. Alfaro**. Inferring ancestral function from morphologically redundant complex traits: examples from fish feeding systems. *Integr. Comp. Biol.*, February 2009; 47
- 2005 **M. E. Alfaro**, D.I Bolnick, P. C. Wainwright. Evolutionary consequences of a redundant map of morphology to mechanics in labrid fishes. *Integr. Comp. Biol.*, February 2009; 49.
- 2003 **M. E. Alfaro**, P. C. Wainwright. A simulation study of the relationship between morphological and functional diversity in fish jaws. *Integr. Comp. Biol.*, February 2009; 49
- 2002 **M. E. Alfaro**, P. C. Wainwright. A simulation study of the relationship between morphological and functional diversity in fish jaws. *Integr. Comp. Biol.*, February 2009; 49
- 2001 **M. E. Alfaro**, S. Zoller and F. Lutzoni. Comparative performance of Bayesian MCMC sampling and maximum likelihood bootstrapping in estimating phylogenetic confidence: a simulation study. *American Zoologist*.
- 2000 **M. E. Alfaro**, J. Janovetz, and M.W. Westneat. Motor control of biting in teleosts. *American Zoologist*.
- 1999 **M. E. Alfaro**. Sweeping, striking and sniping: prey capture modes in thamnophiine snakes. *American Zoologist* 39(5):97A.
- 1998 **M. E. Alfaro**. Striking and sweeping: prey capture modes in thamnophiine snakes. *American Zoologist* 38(5):11A.
- 1997 **M. E. Alfaro** and S. Arnold. Molecular phylogenetics of the thamnophiini (Colubridae) and the evolution of prey capture. *American Zoologist* 37(5):197A.
- 1995 **M. E. Alfaro** and M. W. Westneat. Kinematics and motor patterns of parrotfish feeding. *American Zoologist* 35(5):104A.

CONTRIBUTED PRESENTATIONS AT PROFESSIONAL MEETINGS (*Presenting author)

- 2011 *Phylogenetic distribution of commercially exploited fish species: How many times has 'tastiness' evolved? Evolution, Norman OKC.
- 2011 Are freshwater fish invaders diversifying faster than reef-associated groups? An empirical test using pufferfish (Tetraodontidae), Evolution, Norman OKC.
- 2011 Feeding mode affects evolutionary rates and integration of skull modules in anguilliform fishes Evolution, Norman OKC.
- 2011 Multiple Ways to Crack a Shell: The Evolutionary Trajectories Leading to Imperfect Convergence in Moray Eels (Muraenidae). Evolution, Norman OKC.
- 2011 Roots, rates and fossil states: A Bayesian approach for integrating fossil character information into comparative analyses Evolution, Norman OKC.
- 2011 Estimating evolutionary rates from incomplete phylogenies and data using approximate Bayesian computation. SICB, Salt Lake City, UT.
- 2011 Evolutionary dynamics of boxfish carapace I: phylogenetic diversity. SICB, Salt Lake City, UT.
- 2011 *Evolutionary dynamics of the boxfish carapace II: functional diversity. SICB, Salt Lake City, UT.
- 2011 Functional and morphological convergence in durophagous moray eels. SICB, Salt Lake City, UT.
- 2009 *Integrating taxonomic, phylogenetic, and fossil data in studies of diversification. Evolution, Moscow, ID.
- 2009 Can ancestral morphology accurately predict ancestral form? With Barb Banbury . Evolution, Moscow ID.
- 2009 Long fuses and explosive radiations: Patterns of diversification in the coral reef fish fauna.

- With Francesco Santini . Evolution, Moscow, ID.
- 2009 Was the Neogene the ‘Age of Snakes’? With Hugo Alamillo , Chad Brock, and Luke Harmon. Evolution, Moscow ID.
- 2009 Patterns of morphological and mechanical evolution in triggerfishes. With Alex Dornburg . Evolution, Moscow, ID.
- 2009 *Did genome duplication spawn the teleost radiation? Evidence from analysis of actinopterygian diversification rates. SICB, Boston.
- 2009 Explaining patterns of diversity within ray-finned fishes. With Francesco Santini . SICB, Boston.
- 2008 Phylogeny and phylogeography of capuchin monkeys. With Jessica Lynch Alfaro . International Primatological Society Meetings, Edinburgh, UK
- 2008 [Common biases in empirical tests of diversification using phylogenetic trees](#). With Chad Brock . SICB meetings, San Antonio.
- 2008 *[Testing macroevolutionary hypotheses in fishes: examples from the Acanthomorpha](#). SICB meetings, San Antonio.
- 2008 [Time-scale of spiny-rayed fish \(Acanthomorpha, Teleostei\)](#). With Francesco Santini . SICB meetings, San Antonio.
- 2008 [A Molecular Timescale For Snakes](#). With Hugo Alamillo . SICB meetings, San Antonio.
- 2008 [The Evolutionary History of the Triggerfishes \(Family Balistidae\) with a Comparative Study of Fin Morphology and Mechanics](#). With Alex Dornburg . SICB meetings, San Antonio.
- 2007 Model-averaged phylogenetic inference of the triggerfishes (Family: Balistidae). With Alex Dornburg, undergraduate. American Society for Ichthyology and Herpetology Meetings, Saint Louis, MO.
- 2007 Rates of diversification throughout the major groups of snakes. With Hugo Alamillo, PhD student. American Society for Ichthyology and Herpetology Meetings, Saint Louis, MO
- 2007 Many-to-one Mapping and Evolutionary Dynamics of Form and Function With Barb Banbury (PhD student). American Society for Ichthyology and Herpetology Meetings, Saint Louis, MO
- 2007 *Ubiquity of many-to-one mapping in functional traits: examples and evolutionary implications Society for Integrative and Comparative Biology Meetings, Phoenix, AZ
- 2007 Model averaged phylogenetic inference of triggerfishes (Family Balistidae). With Alex Dornburg (undergrad). Society for Integrative and Comparative Biology Meetings, Phoenix, AZ
- 2007 Inferring ancestral function from morphologically redundant complex traits: examples from fish feeding systems. With Barb Banbury (PhD student). Society for Integrative and Comparative Biology Meetings, Phoenix, AZ.
- Barb was awarded best student paper by the Division of Evolution and Systematics for this poster.***
- 2006 *A molecular timescale for tetraodontiform fishes. Society for the Study of Evolution meetings, Stony Brook, New York
- 2006 Effects of model averaging on phylogenetic inference of tetraodontiform fishes. With Alex Dornburg (undergrad). Society for the Study of Evolution meetings, Stony Brook, New York
- 2005 Phylogeny of the Oriental-Australian rear-fanged water snakes (Colubridae: Homalopsinae) based on DNA sequences. American Society of Ichthyology and Herpetology Meetings, Tampa, Florida

- 2005 *Consequences of redundant form-function mapping. Society for Integrative and Comparative Biology meetings. San Diego
- 2003 *Department of Ecology, Behavior, and Evolution Fall Symposium, La Jolla, CA. Consequences of redundant mapping for the evolution of complex traits: an example using fish jaws.
- 2003 *Society for the Study of Evolution, Chico, CA. Redundant mapping and the evolutionary dynamics of complex traits.
- 2003 *Society for Integrative and Comparative Biology, Toronto, Canada. Evolutionary dynamics of complex traits.
- 2002 *Society for the Study of Evolution, Champaign-Urbana, IL. Comparative performance of Bayesian MCMC and bootstrapping in assessing phylogenetic confidence.
- 2001 *Society for Integrative and Comparative Biology, Chicago, IL. Motor control of biting in teleosts.
- 2000 *American Society of Ichthyologists and Herpetologists, La Paz, Mexico. Testing hypotheses of relationship in thamnophiine snakes.
- 2000 *Society for Integrative and Comparative Biology, Atlanta, GA. Sweeping, striking and sniping: prey capture modes in thamnophiine snakes.
- 1999 *Society for the Study of Evolution, Madison, WI. Systematics and evolution of thamnophiine snakes.
- 1999 *Society for Integrative and Comparative Biology, Denver, CO. Striking and sweeping: prey capture modes in thamnophiine snakes.
- 1998 *Society for Integrative and Comparative Biology, Boston, MA. Molecular phylogenetics of the thamnophiini (Colubridae) and the evolution of prey capture.
- 1997 *American Society of Ichthyologists and Herpetologists, Seattle, WA. Systematics of thamnophiine snakes.
- 1997 *Society for the Study of Evolution, Boulder, CO. Molecular systematics of thamnophiine snakes.
- 1996 *American Society of Ichthyologists and Herpetologists, New Orleans, LA. Prey capture in a sabre-toothed fish: kinematics and electromyography of feeding in *Hydrolicus scomberoides*.
- 1995 *American Society of Zoologists, Washington D.C. Kinematics and motor patterns of parrotfish feeding.

INVITED SEMINARS

- 2012 University of British Columbia
- 2012 Louisiana State University
- 2012 CSU Long Beach
- 2011 University of California, Santa Barbara
- 2011 George Washington University
- 2010 University of Chicago, Chicago, IL
- 2009 Department of Ecology and Evolutionary Biology, CSU Los Angeles, CA.
- 2009 Scripps Institute of Oceanography, San Diego, CA.
- 2009 Department of Ecology and Evolutionary Biology, Brown University. Providence, Rhode Island.
- 2008 Department of Ecology and Evolutionary Biology, UCLA. Los Angeles, California.
- 2008 Department of Biology, University of Washington. Seattle, Washington.

2008 Section of Ecology and Evolutionary Biology, UC Davis. Davis, California.
2007 Florida State University, Tallahassee, FL.
2006 Palouse Ecology, Evolution, and Systematics, Moscow, ID
2004 Duke University, Chapel Hill, NC
2004 University of Arizona, Tucson, AZ
2004 Loyola Marymount, Los Angeles, CA
2004 University of Colorado, Boulder
2004 Washington State University, Pullman, WA
2003 Deep Hyphae-Phylogenetics Symposium, American Mycological Society/British Mycological Society Joint Meeting. Asilomar, CA.
2003 Department of Biology, College of Wooster, Wooster, OH.
2003 Center for Population Biology, University of California, Davis.
2002 Evolution and Ecology, Tulane University, LA.
2002 Bay Area Biosystematists Series, CA.
2001 Sonoma State University Biology Colloquium, Sonoma State University, CA

GRADUATE TRAINING

current graduate students (UCLA)

Laurie Sorenson, PhD candidate
Princess Gilbert, PhD candidate
Tina Marcroft, PhD candidate
Janet Buckner, PhD candidate
Jonathan Chang, MS candidate

former graduate students

Hugo Alamillo, Ph.D. 2010, WSU
Barbary Banbury, Ph.D. 2010, WSU
Chad Brock, MS 2009, WSU

preliminary advising committees (UCLA)

Abigail Curtis
Greer Dolby
Marisa Tellez

PhD dissertation committees (UCLA)

Chris Creese
Ryan Ellingson
Raul Sedano

UNDERGRADUATE TRAINING

2011 undergraduate researchers (UCLA): Erika Harris, Niko Hensley, Jonathan Chang, Jeff Modlin, Vincent Wu
2010 undergraduate researchers (UCLA): Jeff Modlin, Jonathan Chang, Vincent Wu
2009 undergraduate researchers (UCLA): Kelly Huynh, Shahryar Barzegar, Kimberly Jade, Tom Caldwell
2008 and previous undergraduate researchers (WSU): Alex Dornburg,—*Alex took 3rd place in the WSU 2006 undergraduate research competition and 1st place in 2007. Alex is now a PhD student in*

Ecology and Evolutionary Biology at Yale, Amanda Donabauer, Brian Wilson, Cristina Parada, Kelsey Dunne

HIGH SCHOOL SUMMER INTERNS

2009 Alexander Jaffe (sophomore, Harvard-Westlake, North-Hollywood, CA)

2009 Akhil Gupta (sophomore, Chino Hills High School, Chino Hills, CA)

SERVICE (UCLA)

2010-present Graduate Admissions Committee

2009-present Graduate Advisor

2009 Graduate Student Awards Committee

2009 Seminar Committee

2009 LS1 Evaluation Committee

2009 Upper Division Lab Evaluation Committee

SERVICE (WSU)

2005-07 Mentor, Achievers Scholar Program, WSU. (Mentee Chanthan Kuong).

2006 WSU Bioinformatics Search Committee Member

2006 Member, Connor Museum Committee, WSU

2006, 07 Judge, Undergraduate Research Poster Competition, WSU

SERVICE TO SCIENTIFIC COMMUNITY

Editorial Positions: Associate Editor, *Evolution*; Associate Editor, *Frontiers in Population and Evolutionary Biology*

Ad hoc reviewer:

American Zoologist
American Naturalist
Biological Journal of the Linnean Society
BMC Biology
BMC Evolution Biology
Ethology
Evolution
Functional Ecology
Journal of Experimental Biology
Journal of Evolutionary Biology
Journal of Molecular Evolution
Journal of Zoology
Marine and Freshwater Research
Molecular Phylogenetics and Evolution
Physiological and Biochemical Zoology
Proceedings of the Royal Society of London
Science
Systematic Biology
Molecular Biology and Evolution

Molecular Phylogenetics and Evolution

Other Professional Service

- 2012 President Elect, Division of Phylogenetic and Comparative Biology, Society for Integrative and Comparative Biology
- 2011 Judge, Society for Integrative and Comparative Biology DSEB Best Student Poster Competition
- 2011 Mentor, Undergraduate Diversity at SSE/SSB program
- 2011 Organizer and co-instructor of Comparative Methods in R workshop, SICB meetings, Salt Lake City (~65 attendees).
- 2009 Judge, Society for Systematic Biology Graduate Research Awards (Coordinator Sydney Cameron, U. Illinois)
- 2009 Mentor, Undergraduate Diversity at SSE/SSB program (mentees Danielle Tomasello, Penn State, Natasha Cuk, UC Berkeley)
- 2009 Symposium co-organizer and speaker, 'Evolutionary whimpers and bangs: new approaches to diversification studies', Evolution, Moscow ID
- 2009-2011 Program Officer, Division of Systematic and Evolutionary Biology, Society for Integrative and Comparative Biology
- 2010 Organizer and co-instructor of Comparative Methods in R workshop, SICB meetings, Boston (~90 attendees). Course website: <http://www2.hawaii.edu/~mbutler/Rquickstart.html>
- 2008 Advisor, Birmingham High School Academic Decathlon Team, Van Nuys, CA.
- 2005 Public lecturer, strategies for teaching evolutionary biology to high school students, Washington State Teachers Conference, Wenatchee

TEACHING POSITIONS

UCLA

- 2011 Biol 180 Good, Bad, and Ugly Evolution
- 2011 Biol 174 Macroeolution
- 2010 Biol 200a Evolution
- 2010 Biol 174 Macroeolution
- 2009 Biol 200a Evolution.
- 2009 EEB 297 Comparative and evolutionary analyses in R.
- 2009 PhySci 194 Journal club for Minority Access to Research Careers Program. Led four guest lectures and co-supervised a field trip to Two Harbors and the USC Marine Sciences Center. Enrollment 12.
- 2009 Biol 199 Directed research (one student)
- 2009 Biol 99 Undergraduate research (three students).
- 2008 Biol 200a Evolution. Enrollment 18.

WSU

- 2008 Biol 101, Biology for Nonmajors. Enrollment 900
- 2007 Bio; 565 Macroeolution. Enrollment 12
- 2007 Biol 533 Modern Methods in Molecular Systematics. Enrollment 9.
- 2007 Biology 101, Biology for Nonmajors. Enrollment 900.

- 2006 Biol 589 Diversification Dynamics. Enrollment 8.
- 2005 Biol 533 Modern Methods in Molecular Systematics. Enrollment 8.
- 2005 Biology 101, Biology for Nonmajors. Enrollment 1054.
- 2002, 2003 Instructor, Workshop in Applied Phylogenetics, Bodega Marine Laboratory, Bodega Bay, California.
- 2000 Guest Lecturer, Chordate Biology, College of Biological Sciences, University of Chicago.
- 1999 Teaching Assistant, Comparative Vertebrate Anatomy, College of Biological Sciences, University of Chicago
- 1997 Lab Instructor, Molecular Phylogenetics, College of Biological Sciences, University of Chicago.
- 1997 Lab Instructor, Avian Diversity, College of Biological Sciences, University of Chicago.
- 1996 Teaching Assistant, Conservation Biology, College of Biological Sciences, University of Chicago.
- 1996 Teaching Assistant, Vertebrate Paleontology, Department of Anatomy, University of Chicago.
- 1995 Teaching Assistant. Functional Morphology of the Vertebrates, Division of Biological Sciences, University of Chicago.
- 1994 Lab Instructor, Comparative Vertebrate Anatomy. Humboldt State University.
- 1993, 1994 Lab Instructor, Human Anatomy, Humboldt State University.
- 1992 Lab Instructor, Introductory Biology, Humboldt State University.

FIELD EXPEDITIONS

- 2009 Tonga and Samoa. Collected tetraodontiforms for phylogenetic study.
- 2007 Manuel Antonio and Isla Murcielagos, Costa Rica. Collected genetic and morphological material for evolutionary studies of tetraodontiforms and labrids.
- 2006 Carrie Bow Caye Field Station, Belize. Collected genetic and morphological specimens of *Halichoeres* species.
- 2005 Quepos and Manuel Antonio National Park, Costa Rica. Collected genetic samples of capuchin monkeys (*Cebus capucinus*) as part of an ongoing study of capuchin biogeography and cultural evolution.
- 2005 Carrie Bow Caye Field Station, Belize. Collected genetic and morphological specimens of *Halichoeres* species.
- 1999 Eagle Lake, CA. Collected the western aquatic garter snake (*Thamnophis couchii*) for study of striking hydrodynamics.
- 1999 Eagle Lake, CA. Observed foraging behavior of four species of garter snake and collected specimens for molecular and biomechanical analysis.
- 1999 Sedona Valley, AZ. Observed foraging behavior of the narrow-headed garter snake and collected specimens for molecular and biomechanical analysis.

- 1998 Horseshoe Lake, IL. Observed and collected the northern water snake, *Nerodia sipedon*.
- 1997 Joliet, IL. Collected local water and garter snake species.
- 1996 Lonoke, AK. Collected 4 species of water snake for kinematic analysis.
- 1995 Bermuda Marine Biological Station, Bermuda. Collected parrotfishes and performed electromyographic and kinematic field studies of parrotfish feeding. With Mark Westneat. Funded by the Field Museum.
- 1995 Philippines. Research assistant on a five-week expedition to collect tropical reef fishes. With M. Westneat. Collected over 300 whole-body specimens and 200 tissue specimens for the Field Museum. Attended an ICLARM conference and helped develop FishBase and FAO keys.
- 1995 White River, WY and Billings, MO. Coordinated a two week fossil hunting expedition with local entrepreneur Tom Kaye, University of Chicago graduate students Matt Carrano, and Darin Croft. Collected fossil mammal and dinosaur material for Field Museum collections.

RESEARCH EXPERIENCE

- 2006-present Genome size evolution in fishes: *flow cytometry, real-time PCR*
- 2001-present Bayesian phylogenetics. Bayesian methods of model selection. Performance of Bayesian and frequentist confidence measures: *phyloinformatics, Bayesian statistics, simulation techniques, computer programming*
- 2000 Biting in teleost fishes, *sonomicrometry, high speed cinematographer and kinematic analysis, EMG experimental techniques and analysis*.
- 1998-present Molecular phylogenetics of wrasses (Family Labridae), with M. Westneat, Field Museum: *molecular systematics, molecular clocks & evolutionary rates*.
- 1994-present Dissertation research: Systematics and evolution of feeding systems in thamnophiine snakes: the axial and cranial components of prey capture. University of Chicago and Field Museum of Natural History: *high speed cinematography and kinematic analysis, morphometrics, molecular systematics analysis and techniques with an emphasis on maximum likelihood, automated DNA sequencing, comparative analysis*.
- 1998-present Molecular phylogenetics of the garter snakes, *Thamnophis*, with S. Arnold and M. Pfrender, (University of Oregon): *molecular systematics and analysis, biogeography*.
- 1998 Molecular phylogenetics of the parrotfishes (Family Scaridae), with T. Streelman (University of New Hampshire) G. Karl (University of Florida), and M. Westneat (FMNH): *combined data analysis, secondary structure models, molecular systematics*
- 1997 Participant in the Molecular Evolution Workshop, Marine Biological Laboratory, Woods Hole, MA: *molecular systematics methods and philosophy, software and algorithms*.

- 1996-1997 The feeding strike of the vampire characin, *Hydrolicus scomberoides*, with M. Westneat, Field Museum: *high speed video analysis, EMG experimental techniques and analysis*.
- 1994-1995 Kinematics and electromyography of parrotfish feeding, with M. Westneat, Field Museum: *kinematic analysis, EMG techniques and analysis, linkage mechanics*.
- 1992-1994 M.A. thesis research on the morphology of the dinosaurian hyoid apparatus, Humboldt State University, Arcata, CA: *vertebrate comparative anatomy, morphological dissection, phylogenetics*.

SOCIETY MEMBERSHIP

American Society of Ichthyologists and Herpetologists, Society for Integrative and Comparative Biology, Society of Systematic Biologists, American Society of Naturalists