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## Education

**2015** **Ph.D. Marine Science** University of Texas at Austin
**2008** **B.Sc. Biology and Environmental Sciences** University of Panama

## Professional Appointments

**2021-Present** **Assistant Professor** Department of Biological Sciences, Auburn University
**2019- 2021** **Visiting Assistant Professor** Department of Biological Sciences, Auburn University
**2018-2019** **Postdoctoral Researcher** Department of Biological Sciences, SUNY Buffalo
**2016-2018** **Postdoctoral Researcher** Biological and Environmental Sciences and Engineering, King Abdullah University of Science and Technology
**2007-2009** **Laboratory and Field Assistant** Marine and Molecular Laboratories Smithsonian Tropical Research Institute

## Peer-Reviewed Publications Citations: 1148; h-index: 18

(^*Equal contribution; *Graduate student; §Undergraduate student*)

1. Tracy CB, CF Arias, E Tysall, MP Hoeppner, WO McMillan, O Puebla and **MA Bernal**. 2025. Comparative genomics of transisthmian damselfishes (*Abudefduf saxatilis* and *A. troschelii*). *BioRxiv,* DOI: https://doi.org/10.1101/2025.07.17.665425
2. **Bernal MA**, GL Aguilar*, J Sakmar, SN Politis, SL Oglesby§, A Nicholls, AM Kelly, LA Roy, and IAE Butts. 2025. Transcriptome analyses reveal differences in the response to temperature in Florida and Northern largemouth bass (*Micropterus spp.*) during early life stages. *PLOSOne* 20, e0317563. https://doi.org/10.1371/journal.pone.0317563
3. Eaton KM*, JE Samenuk§, L Thaxton§, V Chaves§, and **MA Bernal**. 2025. Broad thermal tolerance and high mitochondrial genetic connectivity in the pinfish (*Lagodon rhomboides*). *Journal of Fish Biology*, 1-11. https://doi.org/10.1111/jfb.16015.
4. Backenstose NJC, DJ MacGuigan, CA Osborne, **MA Bernal**, EK Thomas, E Normandeau, DL Yule, W Stott, AS Ackiss, VA Albert, L Bernatchez, and TJ Krabbenhoft. 2024. Origin of the Laurentian Great Lakes fish fauna through upward adaptive radiation cascade prior to the Last Glacial Maximum. *Communications Biology* 7: 978. doi: https://doi.org/10.1038/s42003-024-06503-z
5. Lotterhos KE^, **MA Bernal**^, Phifer-Rixey M^, Hanley T^. 2024. Lighting pathways to success in STEM: a virtual Laboratory Meeting Programme (LaMP) mutually benefits mentees and host laboratories. *Proceedings of the Royal Society* B 291. doi: https://doi.org/10.1098/rspb.2024.0149
6. Eaton KM*, TJ Krabbenhoft, NJC Backenstose, and **MA Bernal.** 2024 The chromosome-scale reference genome for the pinfish (*Lagodon rhomboides*) provides insights into their evolutionary and demographic history. *G3: Genes, Genomes, Genetics* 14. doi: https://doi.org/10.1093/g3journal/jkae096
7. Swank AR*, CB Tracy*, MT Mendonça, and **MA Bernal**. 2024. Molecular plasticity to ocean warming and habitat loss in a coral reef fish. *Journal of Heredity*, esae024. doi: https://doi.org/10.1093/jhered/esae024
8. Waldo B§^, K Moore§^, S Bickley*, CJ Anderson, and **MA Bernal**. 2023. Salinity fluctuations due to urbanization of coastal environments and their potential effect on the genetic divergence of the Gulf killifish (*Fundulus grandis*). Environmental Biology of Fishes 106: 1539-1550. doi: https://doi.org/10.1007/s10641-023-01433-x

9. Aguilar GL, J Sakmar, A Nicholls, MK Litvak, HN Hess, TJ Bruce, HR Montague, AM Kelly, LA Roy, **MA Bernal**, SN Politis, and IAE Butts. 2023. Effects of temperature and subspecies during critical early life history stages of largemouth bass (*Micropterus salmoides*). *Aquaculture* 570: 739350. doi: https://doi.org/10.1016/j.aquaculture.2023.739350
10. Hallaj A^, L Turner*^, C McArdle[§], and **MA Bernal.** 2023. De novo transcriptomes for two species of snappers from the Western Atlantic (*Lutjanus griseus* and *Lutjanus synagris*). *Marine Genomics* 67:1-4. doi: https://doi.org/10.1016/j.margen.2022.101005
11. Dornburg A, R Mallik, Z Wang, **MA Bernal**, B Thompson, EA Bruford, DW Nebert, V Vasiliou, LR Yohe, JA Yoder, and JP Townsend. 2023. Placing human gene families into their evolutionary context. *Human Genomics* 16:1-26. doi: https://doi.org/10.1186/s40246-022-00429-5
12. Ramírez-Castañeda V, et al. 2022. A set of principles and practical suggestions for equitable fieldwork in biology. *Proceedings of the National Academy of Sciences* 119, e2122667119. doi: https://doi.org/10.1073/pnas.2122667119
13. **Bernal MA,** DL Yule, W Stott, L Evrard, T Dowling, TJ Krabbenhoft. 2022. Concordant patterns of morphological, stable isotope and genetic variation in a recent ecological radiation (Salmonidae: *Coregonus spp*.). Molecular Ecology 31, 4495-4509. doi: https://doi.org/10.1111/mec.16596
14. Chan SKN, S Suresh, P Munday, T Ravasi, **MA Bernal**, and C Schunter. 2022. The alternative splicing landscape of a coral reef fish during a marine heatwave. *Ecology and Evolution* 12, e8738. doi: https://doi.org/10.1002/ece3.8738
15. **Bernal MA,** E Schmidt, JM Donelson, PM Munday, and T Ravasi. 2022. Molecular responses of brains to cross-generational warming in a coral reef fish. *Frontiers in Marine Science*. doi: https://doi.org/10.3389/fmars.2022.784418
16. *Eaton KM, A Hallaj, JA Stoeckel, and **MA Bernal**. 2022. Ocean warming leads to increases in aerobic demand and changes to gene expression in the pinfish (*Lagodon rhomboides*). *Frontiers in Ecology and Evolution*, p.1007. doi: https://doi.org/10.3389/fevo.2021.809375
17. **Bernal MA,** T Ravasi, PM Munday, JM Donelson. 2022. Plasticity to ocean warming is influenced by transgenerational, reproductive, and developmental exposure in a coral reef fish. *Evolutionary Applications* 15: eva.13337. doi: https://doi.org/10.1111/eva.13337
18. *Turner L, NJC Backenstose, S Brandl, and **MA Bernal**. 2021. Range expansion and complete mitochondrial genome of the highfin blenny (*Lupinoblennius nicholsi*). *Molecular Biology Reports* 49, 1587-1591. doi: https://doi.org/10.1007/s11033-021-06932-7
19. Pelosi JA, **MA Bernal**, TJ Krabbenhoft, S Galbo, Carlos Prada, MA Coffroth and H Lasker. 2021. Fine-scale genomic, morphological and reproductive differences delimit the Caribbean octocorals *Plexuara homomalla* and *P. kükenthali. Coral Reefs* 41, 635–653. doi: 10.1007/s00338-021-02175-x
20. Eaton KM*, **MA Bernal**, NJ Backenstose, and TJ Krabbenhoft. 2021. Nanopore amplicon sequencing reveals molecular convergence and local adaptation of opsin genes. *Genome Biology and Evolution* 13 (2), evaa237. doi: 10.1093/gbe/evaa237
21. **Bernal MA**^, CM Schunter^, R Lehmann, D Lightfood, J Rummer, P Munday and T Ravasi. 2020. Molecular Responses of Coral Reef Fishes to a Marine Heatwave. *Science Advances* 6 (12), eaay3423. doi: 10.1126/sciadv.aay3423
22. Salas EM, JP Hobbs, **MA Bernal**, WB Simison, ML Berumen, G Bernardi, LA Rocha. 2020. Distinct patterns of cryptic hybridization across a suture zone in a coral reef fish (*Dascyllus trimaculatus*). *Ecology and Evolution* 10, 2813-2837. doi: 10.1002/ece3.6068
23. **Bernal MA**, GB Dixon, MV Matz and LA Rocha. 2019. Comparative transcriptomics of sympatric species of coral reef fishes (genus: *Haemulon*). *PeerJ* 7 e6541. doi: 10.7717/peerj.6541
24. Schunter C, R Lehmann, **MA Bernal** and T Ravasi. 2019. Unusual bilateral color pattern in a regal angelfish from the Red Sea. *Bulletin of Marine Science* 95, 113-114.

25. Ludt WB, **MA Bernal**, E Kenworthy, E Salas and P Chakrabarty. 2019. Investigating species limits of vagile surgeonfishes of the Eastern Pacific (Acanthuridae: *Prionurus*). *Ecology and Evolution* 9, 4001-4012. doi: 10.1002/ece3.5029
26. **Bernal MA,** JM Donelson, HD Veilleux, PL Munday and T Ravasi. 2018. Phenotypic and molecular consequences of stepwise temperature increase across generations in a coral reef fish. *Molecular Ecology* 27, 4516-4528. doi: 10.1111/mec.14884
27. **Bernal MA**, MR Gaither, B Simison and LA Rocha. 2017. Hybridization and divergent selection have influenced the evolutionary history of grunts of sympatric sister species of grunts (genus: *Haemulon*). *Molecular Ecology* 26, 639-652. doi: 10.1111/mec.13937
28. Gaither MR, **MA Bernal**, I Fernandez-Silva, M Mwale, SA Jones, C Rocha and LA Rocha. 2015. Two deep evolutionary lineages in the circumglobal Glasseye, *Heteropriacanthus cruentatus* (Teleostei, Priacanthidae) with admixture in the Western Indian Ocean. *Journal of Fish Biology* 87, 715-727. doi: 10.1111/jfb.12754
29. **Bernal MA**, SR Floeter, MR Gaither, GO Longo, R Morais, CEL Ferreira, MJA Vermeij and LA Rocha. 2015. High prevalence of dermal parasites among coral reef fishes of Curacao. *Marine Biodiversity* 46, 67-74. doi: 10.1007/s12526-015-0322-z
30. Gaither MR, **MA Bernal**, R Coleman, B Bowen, S Jones, WB Simison and LA Rocha. 2015. Genomic signatures of geographic isolation and natural selection in coral reef fishes. *Molecular Ecology* 24, 1543-1557. doi: 10.1111/mec.13129
31. Sellas AB, K Bassos-Hull, JC Perez-Jimenez, JA Angulo-Valdes, **MA Bernal** and RE Hurt. 2015. Population structure and seasonal migration of the spotted eagle ray, *Aetobatus narinari*. *Journal of Heredity* 106, 266-275. doi: 10.1093/jhered/esv011
32. **Bernal MA**, NL Sinai, C Rocha, MR Gaither, F Dunker and LA Rocha. 2014. Long-term sperm storage in the Brownbanded Bamboo Shark *Chiloscyllium punctatum* Müller & Henle, 1838 (Chondrichthyes: Hesmiscyliidae). *Journal of Fish Biology* 86, 1171–1176. doi:10.1111/jfb.12606.
33. Selkoe KA, OE Gaggiotti, K Andrews, **MA Bernal**, et al. 2014. Emergent Patterns of Population Genetic Structure for a Coral Reef Community. *Molecular Ecology* 23, 3064–3079. doi:10.1111/mec.12804.
34. Rocha LA, **MA Bernal,** MR Gaither and ME Alfaro. 2013. Massively parallel sequencing: the new frontier in biogeography. *Frontiers of Biogeography* 5, 67–77.
35. Ludt WB, **MA Bernal**, BW Bowen and LA Rocha. 2012. Living in the Past: Phylogeography and Population Histories of Indo-Pacific Wrasses (Genus *Halichoeres*) in Shallow Lagoons versus Outer Reef Slopes. *PLoS One* 7, e38042. doi:10.1371/journal.pone.0038042
36. Jones FA, DL Erickson, **MA Bernal**, E Bermingham, WJ Kress, EA Herre, HC Muller-Landau and BL Turner. 2011. The roots of diversity: below ground richness and rooting distributions in a tropical forest revealed by DNA barcodes and inverse modeling. *PLoS One* 6, e24506. doi: 10.1371/journal.pone.0024506
37. **Bernal MA** and LA Rocha. 2011. *Acanthurus tractus* Poey, 1860, a valid Western Atlantic species of surgeonfish (Teleostei, Acanthuridae), distinct from *Acanthurus bahianus* Castelnau, 1855. *Zootaxa* 2905, 63–68. doi: https://doi.org/10.11646/zootaxa.2905.1.5

## Research Grants and Awards

**2023** Auburn University Faculty Travel Award ($1,000)
**2021** Auburn University Faculty Travel Award ($500)
**2020** Agriculture Research Enhancement and Seed Funding (Co-PI; $60,000)
**2015** Society for the Study of Evolution Travel Award ($1,250)
**2014** Lakeside Foundation Grant for International Students, California Academy of Sciences ($23,900)
**2013** Kristina Louie Memorial Fund, Institute for Biodiversity Science and Sustainability, California Academy of Sciences ($5,000)
**2013** Award for Innovation and Research Excellence, University of Texas at Austin ($2,000)
**2013** California Academy of Sciences Research Excellence Awards: Drivers of coral reef fish speciation (Co-PI, $8,000)
**2011-2015** Travel Fund Awards, University of Texas Marine Science Institute ($2,800)

**2011 & 2013** Professional Development Award, University of Texas at Austin ($2,000)
**2009** Scholarship for Graduate Studies in Science, SENACYT Panama ($199,500)
**2008** Sigma Lambda Chapter of Honor, Faculty of Natural and Exact Sciences, University of Panama, Panama
**2003** Scholarship for distinguished undergraduate students, IFARHU Panama ($2,500)

## Mentoring and Teaching

*Mentoring:* Direct mentor of three PhD Students, one MSc student and six undergraduate students at Auburn University. Two PhDs and one MSc student successfully graduated from the lab. Thesis committee member for three master student and four PhD students at Auburn University.

*Teaching:* Main Instructor for *Biology of Marine Systems* (Spring 2020/2021); *Climate Change Physiology and Evolution* (Fall 2021 to Present); Evolution and Systematics (Spring 2022 to Present); *Molecular Ecology* (Fall 2024 to Present). All course materials for these classes were updated and they now include discussions of peer reviewed articles, active learning activities, and resources centered around diversity, equity and inclusion.

## Selected Presentations

2025 **Bernal MA.** Marine fishes in a changing planet: physiological and molecular responses of marine fishes to ocean warming. College of Veterinary Medicine, Auburn University. *In person.*
2025 **Bernal MA**, A Clark and C Anderson. Coastal urbanization drives salinity fluctuations and differences in osmotic regulation in the Gulf Killifish (*Fundulus grandis*). Evolution Meeting, Athens, Georgia.
2025 **Bernal, MA. Respuestas de peces marinos al cambio climático: una perspectiva fisiológica y molecular.** Seminario de Internacionalización. Facultad de Ciencias**,** Universidad Católica de la Santísima Concepción. *Virtual seminar*.
2024 **Bernal, MA.** Marine fishes in a changing planet: responses to warming and habitat degradation. Evolution Meeting, Canada.
2024 **Bernal, MA.** Transgenerational responses to warming and habitat degradation in coral reef fishes. Society for Experimental Biology, Czech Republic. *Invited speaker*
2024 **Bernal, MA.** Marine fishes in a changing planet: responses to warming and habitat degradation. Department of Biological Sciences, Cal Poly Humbolt. *Invited speaker*
2023 **Bernal, MA.** Responses of tropical damselfishes to warming and habitat degradation. Indo-Pacific Fish Conference, New Zealand. *Symposium organizer and speaker*.
2023 **Bernal, MA.** Marine fishes in a changing planet: responses to warming and habitat degradation. Department of Marine and Environmental Sciences, Northeastern University. *Invited speaker*
2023 **Bernal, MA.** Marine fishes in a changing planet: physiological and molecular responses to ocean warming. Department of Marine Biology, Texas A&M Galveston. *Invited speaker*
2023 **Bernal, MA.** Marine fishes in a changing planet: effects of warming on molecular responses. Tupper Seminar Series, STRI Panama. *Invited speaker*
2023 **Bernal, MA.** Respuestas fisiológicas y moleculares de peces marinos al incremento de temperatura. CICESE, Universidad de Ensenada, Mexico. *Virtual invited speaker*
2023 **Bernal, MA.** Marine fishes in a changing planet: physiological and molecular responses to ocean warming. Department of Integrative Biology, UC Berkeley. *Invited speaker*
2022 **Bernal, MA.** How will marine fishes respond to global warming. Department of Biology, University of Alabama Birmingham. *Invited speaker*
2022 **Bernal MA.** Plasticity to ocean warming in tropical damselfishes: molecular and aerobic perspectives. Evolution Meeting, Cleveland. *In person*.
2022 **Bernal, MA.** Marine fishes in a changing planet. Marine Science Institute, University of Texas at Austin. *Virtual* i*nvited speaker*
2021**Bernal MA.** Effects of ocean warming on the molecular responses of brain in a coral reef fish. Congreso Latinoamericano de Evolución (CLEVOL). *Symposium Organizer*

2021 **Bernal, MA.** Responses of marine fishes to temperature increase. Marine Science Program, Savannah State University. *Invited speaker*

2021 **Bernal, MA.** Molecular and responses of marine fishes to global warming. Department of Environmental Conservation, University of Massachusetts Amherst. *Virtual invited speaker*

2021 **Bernal, MA. Bernal, MA.** Evaluación de los efectos del calentamiento global en peces marinos. 7th Scientific conference for the Autonomous University of Chiriqui, Panama. *Virtual invited speaker*

2021 **Bernal, MA.** Los efectos del cambio climático en peces tropicales: qué podemos esperar en las próximas décadas? Conference for the Panamanian Society for the Advancement of Science, Panama. *Invited speaker*

2021 **Bernal MA,** J Donelson, PM Munday, T Ravasi. Responses of a tropical marine fish to global warming: acute reactions vs. long-term effects. Evolution Meeting. *Virtual seminar*.

2020 **Bernal, MA.** Don't push me because I'm close to the edge: responses of tropical marine fishes to marine heatwaves. Western Society of Naturalists Marine Heatwaves Symposium. *Virtual invited speaker*

2020 **Bernal, MA.** Marine fishes in a changing planet. Institute for Biodiversity Science and Sustainability, California Academy of Sciences. *Virtual invited speaker*

2020 **Bernal, MA.** How will coral reef fishes respond to global warming? Tupper Seminar, Smithsonian Tropical Research Institute, Panama. *Virtual invited speaker*

2020 **Bernal MA**. How will tropical marine fishes respond to climate change? Natural History Museum, Louisiana State University. *Invited speaker*

2019 **Bernal MA**. Response of marine fishes to global change. School of Fisheries and Aquaculture, Auburn University. *Invited speaker*

2019 **Bernal MA**. How will coral reef fishes respond to global warming? Natural History Museum, University of Florida. *Invited speaker*

2019 **Bernal MA,** DL Yule, W Stott, L Evrard, T Dowling, TJ Krabbenhoft. Evaluating phenotypic, ecological and genomic differences between sympatric cicoes (*Coregonus*) of the Great Lakes. Evolution Meeting, Rhode Island.

2018 **Bernal MA**, CM Schunter, R Lehmann, D Lightfood, J Rummer, P Munday and T Ravasi. Response of five fish species to a marine heatwave. Asia-Pacific Coral Reef Symposium, Philippines. *Symposium organizer*

2018 **Bernal MA**, CM Schunter, R Lehmann, D Lightfood, J Rummer, P Munday and T Ravasi. Molecular responses of coral reef fishes to a marine heatwave. Marine Evolution Conference, Sweden. *Symposium organizer*

2017 **Bernal MA,** JM Donelson, HD Veilleux, PL Munday, T Ravasi. Step-wise temperature increase across generations leads to recovery of aerobic capacity in a coral reef fish. Indo-Pacific Fish Conference, French Polynesia.

2016 **Bernal MA**. Speciation of coral reef fishes. Division of Research and Graduate Studies, University of Panama, Panama. *Invited speaker*

2016 **Bernal MA**. Perspectives on speciation of coral reef fishes. INDICASAT, Panama. *Invited speaker*

2016 **Bernal MA**. Speciation of coral reef fishes: how selection shapes and maintains biodiversity in marine systems. Tupper Seminar, Smithsonian Tropical Research Institute, Panama. *Invited speaker*

2015 **Bernal MA**, MV Matz, GB Dixon, LA Rocha. Analysis of the transcriptome of three sympatric species of grunts (genus: *Haemulon*), with perspectives on speciation of coral reef fishes. Evolution Meeting, Brazil.

2014 **Bernal MA**. Speciation in coral reef fishes. UT Marine Science Institute. *Invited speaker*

2014 **Bernal MA**, MR Gaither, WB Simison, A Sellas, LA Rocha. Smells like fish species: evidence for sympatric speciation in grunts (genus: *Haemulon*). Evolution Meeting, North Carolina.

2014 **Bernal MA**, Matz M, Rocha LA. Speciation of grunts (Genus *Haemulon*): Lessons from massively parallel sequencing in coral reef fishes. SICB meeting, Texas.

2013 **Bernal MA**. RADSeq and applications for the study of coral reef fishes. Institute of Marine Science, UC Santa Cruz. *Invited speaker*

2013 **Bernal MA**, Gaither MR, Rocha LA. Speciation with gene flow? Lessons from massively parallel sequencing in coral reef fishes (*Haemulon*). Indo Pacific Fish Conference, Japan.

2012 **Bernal MA**, Rocha LA. Speciation with gene flow in a coral reef fish? A fascinating story from an unsexy group of teleosts (genus: *Haemulon*). First Joint Congress on Evolutionary Biology, Canada.

**Reviews**

- Reviewer for more than 20 scientific journals (2012-Present). Recognized as top Reviewer of Molecular Ecology (2015), Outstanding Reviewer for Molecular Phylogenetic and Evolution (2015).
- External reviewer for National Science Foundation grants, including programs Biological Oceanography, Organismal Responses to Climate Change and Postdoctoral Research Fellowships in Biology (2021-Present).
- Reviewer for postdoctoral and doctoral grants for the Smithsonian Tropical Research Institute (2022-Present).
- Reviewer for internal awards and limited submission grants at Auburn University, at both student and faculty level.
- Reviewer for all graduate student applications for the Department of Biological Sciences at Auburn University (2023-Present).

**Summary of Outreach and Science Communication Activities (2012-Present)**

- Interviewed by news agencies, including: Noticiero Telemetro Reporta for segment Mentes Brillantes (150,000 viewers), Noticias Telemundo (+300,000 viewers), and WRLB Columbus GA (+100,000 viewers).
- Outreach activities for hundreds of K-12 students from diverse backgrounds through Auburn University, including Auburn Science and Engineering Fair, Science Café, Osher Lifelong Learning Institute, COSAM Office of Equity, Diversity, and Inclusion.
- Extensive experience lecturing K-12 students in topics related with climate change, marine science and fish diversity. Examples include Skype with a scientist program and supervision of high school Panamanian students in scientific projects through SENACYT Panama.
- Presented in dozens of outreach activities at natural history museums, including the California Academy of Sciences and Biomuseo Panama.
- Interviews and articles in several media outlets (newspapers, websites and magazines) including: BBC, California Academy of Sciences, Eureka Alert, La Prensa Panama, Revista Imagina and Scientific American.

**Additional appointments and service**

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| Auburn University Graduate Studies Committee | 2023-Present |
| Smithsonian Tropical Research Institute Research Associate | 2022- Present |
| Accountability working group COSAM | 2020- Present |
| Auburn University Biology Graduate Recruitment Committee | 2019- 2023 |