

Curriculum Vitae

Mercer R. Brugler, Ph.D.

American Museum of Natural History

Division of Invertebrate Zoology
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NYC College of Technology

City University of New York (CUNY)
Biological Sciences Department (A-502C)
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Professional Experience

Summer 2019. Adjunct Lecturer at Columbia University (E3B Program)
2016-*present*. Adjunct Assistant Professor at NYU-SPS Division of Applied Undergraduate Studies
2014-*present*. Tenure-Track Associate Professor of Biology at NYC College of Technology (CUNY)
2011-2014. Gerstner Scholar and Postdoctoral Fellow at the American Museum of Natural History

Academic Appointments

2014-*present*. Research Associate at the National Museum of Natural History, Smithsonian Institution
2013-*present*. Research Associate at the American Museum of Natural History

Education

2004-2011. Ph.D. in Environmental and Evolutionary Biology. University of Louisiana at Lafayette (LA)
2001-2004. M.S. in Marine Science/Biology. College of Charleston's Grice Marine Laboratory (SC)
1997-2001. B.S. in Marine Science/Biology (Chemistry Minor). University of Miami (FL)

Research Interests

- Deep-sea biology
- Evolution and diversity of marine invertebrates, with particular interest in cnidarians
- Molecular systematics and evolutionary history of black corals (antipatharians) and anemones (actinarians)
- Combining morphology and DNA to elucidate and describe new species of black coral and sea anemone
- Effects of dispersal and gene flow on the genetic structure of shallow and deep-water populations
- Evolution of mitochondrial gene order, gene content and genome architecture in basal metazoans
- Nuclear genome and transcriptome assembly, QC, annotation and phylogenetic analysis

Grants

- CUNY (via Dan McCloskey, CUNY's Interim Vice Chancellor for Research). \$26,000. May 2018
- NSF DEB-Phylogenetic Systematics (collaborator; 1457817 & 1457581). \$702,295. May 2015
- U.S. Department of Justice (through the Smithsonian Institution's NMNH). January 2015
- Amazon Web Services Education Coursework Grant. January 2013
- Canadian Department of Fisheries and Oceans. February 2012
- Continental Shelf Associates (subcontract). January 2008
- Louisiana's Board of Regents NSF EPSCoR Links with Industry, Research Centers, and National Laboratories (LINK) program (NSF(2007)-LINK-24). June 2007

Fellowships

- AMNH Postdoctoral Fellowship. January 2011
- Louisiana Board of Regents Support Fund Fellowship (LEQSF[2004-2009]-GF-21). March 2004

Awards

- NYU School of Professional Studies Teaching Excellence Award. March 2019
- UNOLS Early Career Co-Chief Scientist Deep-Submergence Training Cruise. April 2016
- PSC-CUNY Research Award. April 2016
- Perkins Major Effort Component 2015-2016. May 2015
- Professional Development Advisory Council (PDAC) of NYC College of Technology. May 2015
- UNOLS DeSSC New-Users (Early Career Scientist) Program. October 2014
- Gerstner Family Foundation. March 2011 & July 2013
- 4th International Symposium on Deep-Sea Corals (Wellington, New Zealand). November 2008
- Slocum-Lunz Foundation. May 2003
- Joanna Deepwater Foundation. April 2003

Recent Proposals (Funded)

- *Sharing Flower Garden Banks with the World Through Telepresence*. PI: David Lovalvo (Global Foundation for Ocean Exploration). Co-PI: **MR Brugler**. Funding Opportunity Title: FY18 Deep-Sea Exploration, Characterization, and Education in National Marine Sanctuaries Using Telepresence. Federal Agencies: National Ocean Service, National Oceanic and Atmospheric Administration, Department of Commerce. Submitted: 07/23/18. Decision: 09/21/18. Budget (over 3 years): **\$2,985,280**. Funding for Year 1 (\$987,695) has been apportioned. Out-year funding is subject to the availability of funds.
- *Connectivity of Coral Ecosystems in the Northwestern Gulf of Mexico*. PI: Santiago Herrera (Lehigh University). Collaborator: **MR Brugler**. Funding Opportunity Title: 2018 Regional Ecosystem Prediction Program: Understanding Coral Ecosystem Connectivity in the western Gulf of Mexico. Federal Agencies: NOS, NOAA, DoC. Submitted: 02/09/18. Decision: 09/06/18. Budget (over 5 years): **\$3,747,910**.

Proposals (In Review)

- *An Icelandic Analog for Hydrothermal Habitability on Mars*. PI: Roy Price (SUNY Stony Brook). Co-I: **MR Brugler**. Funding Opportunity Title: Habitable Worlds. Federal Agency: NASA. Proposal No: 18-HW18-0034. Solicitation Announcement: NNH18ZDA001N, Research Opportunities in Space Science (ROSES-2018). Step 1 proposal submitted on 11/13/18. Full proposal encouraged on 11/28/18. Step 2 (full) proposal submitted 03/29/19. Budget: **\$908,904**.
- *Enhancing Students' Understanding and Engagement with Visualization and Imaging: An Interactive and Interdisciplinary Approach*. Funding Opportunity Title: Perkins 2019-2020. Agency: CUNY. PI: Tatiana Voza (City Tech). Co-PI: **MR Brugler**. Budget: **\$82,800**.

Proposals (Reviewed and Declined)

- *Genomics in the Deep Sea – Understanding Black Coral Evolution and Longevity*. PIs: L Holland (Victoria University of Wellington, New Zealand), J Bell (VU of Wellington) & **MR Brugler**. Funding Agency: New Zealand Marsden Fund in Ecology, Evolution & Behaviour (EEB). Budget: \$320,000. Declined on 05/18/17.
- *A foot in both camps: Comparative (mito)genomic investigations on the enigmatic genus Dendrobrachia (Cnidaria: Anthozoa) using NGS technology*. Postdoc: A Poliseno (Ludwig Maximilian University of Munich, Germany). Postdoc Sponsor: **MR Brugler**. Funding agency: Smithsonian Biodiversity Genomics Postdoctoral Fellowship Program 2016. Budget: \$4,000 (supplies) + postdoc salary for A Poliseno. Declined on 03/24/17.
- *Lights, Cameras, Robots – Virtual Reality Imaging in the Deep Sea for Science, Education and Public Engagement*. PIs: V Ferrini (Lamont-Doherty Earth Observatory, Columbia University), DJ Fornari (WHOI), & **MR Brugler**. Co-PI: J Herter (Office of Planning & Development, NY Department of State). Submitted to Schmidt Ocean Institute on 06/20/16. Budget: \$209,900. Declined on 11/02/16.
- *Exploring environmental, biological, and ecological diversity across the mesophotic to deep-sea transition zone in the Caribbean U.S. EEZ*. PI: A Quattrini (Harvey Mudd). Collaborator: **MR Brugler**. Submitted to NOAA's Office of Ocean Exploration & Research on 01/08/16. Budget: \$850,360. Declined on 05/31/16.

Peer-Reviewed Primary Literature Articles

- Stampar SN, Broe MB, MacRander J, Reitzel AM, **Brugler MR**, Daly M, 2019. Linear mitochondrial genome in Anthozoa (Cnidaria): A case study in Ceriantharia. *Scientific Reports* 9(1): 6094 (Impact Factor [IF]: 4.609)
- Siddall ME, Barkdull M, Tessler M, **Brugler MR**, Borda E, Hekkala E, 2019. Ideating iDNA: Lessons and limitations from leeches in legacy collections. *PLoS ONE* 14(2): e0212226 (IF: 2.766)
- Bo M, Barucca M, Biscotti MA, **Brugler MR**, Canapa A, Canese S, Lo Iacono C, Bavestrello G, 2018. Phylogenetic relationships of Mediterranean black corals (Cnidaria) and implications for classification within the order Antipatharia. *Invertebrate Systematics* 32: 1102-1110 (IF: 1.651)
- Brugler MR**, Aguado MT, Tessler M, Siddall ME, 2018. The transcriptome of the Bermuda fireworm *Odontosyllis enopla* (Annelida: Syllidae): A unique luciferase gene family and putative epitoky-related genes. *PLoS ONE* 13(8): p.e0200944.
- Brugler MR**, González-Muñoz RE, Tessler M, Rodríguez E, 2018. An EPIC journey to locate single-copy nuclear markers in sea anemones. *Zoologica Scripta* 47(6): 756-776 (IF: 3.057)
- Quattrini AM, Faircloth BC, Dueñas LF, Bridge TCL, **Brugler MR**, Calixto-Botía IF, DeLeo DM, Foret S, Herrera S, Lee SMY, Miller DJ, Prada C, Rádis-Baptista G, Ramírez-Portilla C, Sánchez JA, Rodríguez E, McFadden CS, 2018. Universal target-enrichment baits for anthozoan (Cnidaria) phylogenomics: New approaches to long-standing problems. *Molecular Ecology Resources* 18(2): 281-295 (IF: 7.059)
- Simon S, Sagasser S, Saccenti E, **Brugler MR**, Schranz ME, Hadrys H, Amato G, DeSalle R, 2017. Comparative transcriptomics reveal developmental turning points during embryogenesis of a hemimetabolous insect, the damselfly *Ischnura elegans*. *Scientific Reports* 7(1): 13547.
- Tessler M, Neumann JS, Afshinnekoo E, Pineda M, Hersch R, Velho LF, Segovia BT, Lansac-Toha FA, Lemke M, DeSalle R, Mason CE, **Brugler MR**, 2017. Large-scale differences in microbial biodiversity discovery between 16S amplicon and shotgun sequencing. *Scientific Reports* 7(1): 6589.
- Marlow J, Borrelli C, Jungbluth SP, Hoffman C, Marlow J, Girguis PR, **AT-36 Team***, 2017. Opinion: Telepresence is a potentially transformative tool for field science. *Proceedings of the National Academy of Sciences* 114(19): 4841-4844 (IF: 9.661)
- Tessler M*, **Brugler MR***, DeSalle R, Hersch R, Velho LFM, Segovia BT, Lansac-Toh FA, Lemke MJ, 2017. A global eDNA comparison of freshwater bacterioplankton assemblages focusing on large-river floodplain lakes of Brazil. *Microbial Ecology* 73(1): 61-74 (IF: 3.614) *Equal contribution
- Kolokotronis S-O*, Foux J*, Rosenfeld JA, **Brugler MR**, Reeves D, Benoit JB, Booth W, Robison G, Steffen M, Sakas Z, Palli SR, Schal C, Richards S, Narechania A, Baker RH, Sorkin LN, Amato G, Mason CE, Siddall ME, DeSalle R, 2016. The mitogenome of the bed bug *Cimex lectularius* (Hemiptera: Cimicidae). *Mitochondrial DNA Part B: Resources* 1:1, 425-427 (IF: 0.486) *Equal contribution
- Rosenfeld JA, Reeves D, **Brugler MR**, Narechania A, Simon S, Durrett R, Foux J, Shianna K, Schatz MC, Gandara J, Afshinnekoo E, Lam ET, Hastie AR, Chan S, Chao H, Saghbini M, Kentsis A, Planet PJ, Kholodovych V, Tessler M, Baker R, DeSalle R, Sorkin L, Kolokotronis S-O, Siddall ME, Amato G, Mason CE, 2016. Genome assembly and geospatial phylogenomics of the bedbug *Cimex lectularius*. *Nature Communications* 7, 10164 (IF: 12.353)
- Siddall ME, **Brugler MR**, Kvist S, 2016. Comparative transcriptomic analyses of three species of *Placobdella* (Rhynchobdellida: Glossiphoniidae) confirms a single origin of blood feeding in leeches. *Journal of Parasitology* 102(1): 143-150. (IF: 1.395)
- Foux J, **Brugler MR**, Siddall ME, Rodriguez E, 2015. Multiplexed pyrosequencing of nine sea anemone (Cnidaria: Anthozoa: Hexacorallia: Actiniaria) mitochondrial genomes. *Mitochondrial DNA Part A* 27(4): 2826-2832. (IF: 0.575)
- MacRander J, **Brugler MR**, Daly, M, 2015. An RNA-seq approach to identify putative toxins from acrorhagi in aggressive and non-aggressive *Anthopleura elegantissima* polyps. *BMC Genomics* 16:221. (IF: 3.729)

*AT-36 Team: Dekas A, Skarke A, Blackman D, Fornari D, Soule A, Van Dover C, Bagge L, Barco R, Boulahanais B, Bowman K, **Brugler MR**, Bush S, Djurhuus A, Fernandez J, Fulweiler R, Kinsey J, Kocot K, McVeigh D, Navarro M, Netburn A, Pasulka A, Twing K, Wagner A, Zambon J

- González-Muñoz R, Simões N, Mascaró M, Tello-Musi JL, **Brugler MR**, Rodríguez E, 2014. Morphological and molecular variability of the sea anemone *Phymanthus crucifer* (Cnidaria, Anthozoa, Actiniaria, Actinoidea). *Journal of the Marine Biological Association of the UK* 95: 69-79. (IF: 1.403)
- Rodríguez E, Barbeitos MS, **Brugler MR**, Crowley L, Grajales A, Gusmao L, Haussermann V, Reft A, Daly M, 2014. Hidden among sea anemones: The first comprehensive phylogenetic reconstruction of the order Actiniaria (Cnidaria, Anthozoa) reveals a novel group of hexacorals. *PLoS ONE* 9(5): e96998
- Kvist S, **Brugler MR**, Goh TG, Giribet G, Siddall ME, 2014. Pyrosequencing the salivary transcriptome of *Haemadipsa interrupta* (Annelida: Clitellata: Haemadipsidae): anticoagulant diversity and insight into the evolution of anticoagulation capabilities in leeches. *Invertebrate Biology* 133(1): 74-98. (IF: 1.333)
- Brugler MR**, France SC, Opresko DM, 2013. The evolutionary history of the order Antipatharia (Cnidaria: Anthozoa: Hexacorallia) as inferred from mitochondrial and nuclear DNA: Implications for black coral taxonomy and systematics. *Zoological Journal of the Linnean Society* 169: 312-361. (IF: 2.685)
- MacIsaac KG, Best M, **Brugler MR**, Kenchington ELR, Anstey LJ, Jordan T, 2013. *Telopathes magna* gen. nov., spec. nov. (Cnidaria: Anthozoa: Antipatharia: Schizopathidae) from deep waters off Atlantic Canada and the first molecular phylogeny of the deep-sea family Schizopathidae. *Zootaxa* 3700(2): 237-258. (IF: 0.931)
- Lauretta D, Häussermann V, **Brugler MR**, Rodríguez E, 2013. *Isoparactis fionae* sp. nov. (Cnidaria: Anthozoa: Actiniaria) from Southern Patagonia with a discussion of the family Isanthidae. *Organisms Diversity and Evolution* 14: 31-42. (IF: 2.369)
- Opresko DM, Wagner D, Montgomery AD, **Brugler MR**, 2012. Discovery of *Aphanipathes verticillata* (Cnidaria: Anthozoa: Antipatharia: Aphanipathidae) in the Hawaiian Islands. *Zootaxa* 3348: 24-39.
- Wagner D, **Brugler MR**, Opresko DM, France SC, Montgomery AD, Toonen RJ, 2010. Using morphometrics, *in situ* observations and genetic characters to distinguish among commercially valuable Hawaiian black coral species; a redescription of *Antipathes grandis* Verrill, 1928 (Antipatharia: Antipathidae). *Invertebrate Systematics* 24: 271-290.
- Thoma JN, Pante EG, **Brugler MR**, France SC, 2009. Deep-sea octocorals and antipatharians show no evidence of seamount-scale endemism in the NW Atlantic. *Marine Ecology Progress Series* 397: 25-35. (IF: 2.619)
- Van der Ham J, **Brugler MR**, France SC, 2009. Exploring the utility of an indel-rich, mitochondrial intergenic region as a molecular barcode for bamboo corals (Octocorallia: Isididae). *Marine Genomics* 2 (3-4): 183-192. (IF: 1.937)
- Brugler MR**, France SC, 2008. The mitochondrial genome of a deep-sea bamboo coral (Cnidaria, Anthozoa, Octocorallia, Isididae): genome structure and putative origins of replication are not conserved among octocorals. *Journal of Molecular Evolution* 67: 125-136. (IF: 1.863)
- Daly M, **Brugler MR**, Cartwright P, Collins AG, Dawson MN, Fautin DG, France SC, McFadden CS, Opresko DM, Rodríguez E, Romano S, Stake J, 2007. The phylum Cnidaria: A review of phylogenetic patterns & diversity three hundred years after Linnaeus. *Zootaxa* 1668: 127-182.
- Brugler MR**, France SC, 2007. The complete mitochondrial genome of the black coral *Chrysopathes formosa* (Cnidaria: Anthozoa: Antipatharia) supports classification of antipatharians within the subclass Hexacorallia. *Molecular Phylogenetics and Evolution* 42(3): 776-788. (IF: 4.018)

Peer-Reviewed Primary Literature Article (In Review)

- Lansac-Tôha FM, Bini LM, Meira BR, Segovia BT, Pavanelli CS, Bonecker CC, de Deus CP, Benedito E, Alves GM, Manetta GI, Higuti J, Dias JD, Vieira LCG, Rodrigues LC, Roberto MdC, **Brugler MR**, Lemke MJ, Tessler M, DeSalle R, Mormul RP, Amadio S, Lolis SF, Jati S, Siqueira T, Silva WM, Lansac-Tôha FA, Martens K, Velho LFM. Scale-dependent patterns of metacommunity structuring in aquatic organisms across floodplain systems. *Global Ecology & Biogeography*. (IF: 5.273)

Peer-Reviewed Primary Literature Articles (In Prep)

- Brugler MR**, Opresko DM, France SC. Mitogenomics of the black coral family Leiopathidae (Cnidaria: Anthozoa: Hexacorallia: Antipatharia).

Quattrini AM, Rodriguez E, Faircloth B, **Brugler MR**, Kitahara M, Morrison C, Paz-Garcia D, Reimer J, Sanchez JA, McFadden CS. Timing and diversification of the coral tree of life: insights into skeletal evolution across paleoclimate conditions.

Opresko DM, **Brugler MR**, Stewart R, Voza T, Tracey D. New genus and species of black corals from the SW Pacific and Antarctica (Cnidaria: Anthozoa: Antipatharia: Schizopathidae).

Handbook

A handbook on mentoring students in undergraduate research: proven strategies for success. Completed in collaboration with City Tech's Undergraduate Research Committee. Released 10/26/16. ISBN-10: 0-692-78964-2; ISBN-13: 978-0-692-78964-3.

Textbook Chapter (In Review; First Draft Submitted on October 15, 2018)

The Invertebrate Tree of Life, to be published by CRC Taylor & Francis. Editors: Bernd Schierwater and Rob DeSalle. Chapter 10: *The Anthozoa*. Co-authors: Andrea Quattrini (Harvey Mudd) & Danielle DeLeo (FIU).

Teaching (Full Instructor)

- ***The Life Aquatic (EEEEB-S1115)*** (25 students) – Columbia University (E3B Program)
Starting July 8, 2019
- ***Evolution (BIO-2250)*** (24 students) - NYC College of Technology (CUNY)
SP19 (1 section), SP18 (1)
- ***Darwin to DNA: An Overview of Evolution (SCNC1-UC3218)*** (24 students) - NYU-SPS DAUS
SP19 (1), FA18 (1), SP18 (1), SP17 (1), FA16 (1), SP16 (1)
- ***Natural History of New York City (SCNC1-UC3290)*** (10 students) - NYU-SPS Access Program
FA17 (1)
- ***General Biology I (BIO-1101)*** (48 students) - NYC College of Technology (CUNY)
FA18 (1), FA16 (1), SP16 (1), FA15 (1)
- ***General Biology II (BIO-1201)*** (48 students) - NYC College of Technology (CUNY)
SP17 (1), FA16 (1), SP16 (1), FA15 (1), SP15 (2), FA14 (1)
- ***General Biology II laboratory (BIO-1201L)*** (24 students) - NYC College of Technology (CUNY)
SP18 (2), SP17 (2), FA16 (1), SP16 (1), FA15 (1), SP15 (2), FA14 (2), Summer 2014 (1)
- ***Next-Generation DNA Sequencing lecture/lab*** - AMNH's Richard Gilder Graduate School
SP14 & 13 (included PhD students from the AMNH, NYU, Columbia & CUNY)
Developed course; held at the New York Genome Center; co-instructed with Dr. Mark Siddall
- ***Biological Principles and Issues I*** (non-majors) - UL Lafayette
FA10 (150 students), SU09 (85 students), SP09 (259 students)
- ***Fundamentals of Biology I*** (biology majors) - UL Lafayette
FA09 (305 students)

Newly-Developed Courses

- ***Unseen Oceans In-Exhibition Course*** – AMNH. January 15 - February 12, 2019.
- ***Oceans Sci Viz Course***. AMNH Education Department Youth Initiatives Program. April 22-26, 2019.
- ***New York City's Natural & Urban Environment*** - NYU-SPS DAUS (will be offered in Fall 2020)

Teaching Assistantships

- ***Advanced Invertebrate Zoology Laboratory*** - UL Lafayette; Fall 2008 & 2006
- ***Human Physiology Laboratory*** - College of Charleston; Fall 2001 through Spring 2003
- ***Evolution and Biodiversity Workshop*** - University of Miami; Fall 1998

Teaching Improvement Activities

- City Tech GenEdge Pedagogy Workshop: When You Look, What Do You See? How Can Teaching the Skill of Observation Influence Inquiry Across Disciplines? March 7, 2017
- City Tech Workshop: Writing Across the Curriculum: Assisting ESL Writers; March 31, 2016
- CUNY Workshop: Research in the Classroom – Integrating Authentic Research into the Undergraduate Curriculum; March 11, 2016
- NYU Workshop: Teaching Effectiveness, Part II; Feb 26, 2016
- NYU Workshop: Making It Stick - Effective Strategies for Teaching & Learning; Feb 26, 2016
- NYU Workshop: Teaching Effectiveness, Part I; Feb 19, 2016
- City Tech Workshop: Knowing Brooklyn Through Place-Based Open Digital Pedagogy; Feb 18, 2016
- City Tech Workshop: Writing Across the Curriculum: The Creative Classroom; Dec 10, 2015
- AMNH Scientific Teaching Workshop: Expanding Your Teaching Toolbox; an introduction to active and scientific teaching approaches; April 10, 2015
- City Tech Workshop: Bridging the Gap: Cognitive Research & Instructional Practice; 6-part study group; March & April 2015
- City Tech OpenLab Training Workshop (Getting Started - Feb 5; Blogging w/ Students - March 5, 2015)
- City Tech 'A Living Laboratory' Associate Fellowship (Spring 2015); learned general education outcomes (Kuh's High Impact Educational Practices, place-based learning, open pedagogy and assessment)
- McGraw-Hill Education Training Courses; Oct 27 & Nov 11, 2014
- Blackboard version 9.1 Assessment Tool Workshop; Oct 8, 2014

Student Training / Mentoring at the AMNH

- Fall 2018. Accepted one AMNH Helen Fellow (Madelyne Xiao from Stanford University)
- Summer 2018. Accepted one NSF REU student (Laura Blum from Middlebury College)
- Spring 2018 - *present*. Mentoring three postbacs (Vanessa Van Deusen [Barnard College], Horia Lee Popa [Stony Brook University] and Colin Joseph [City Tech]), nine City Tech undergraduates (Nadia Alomari, Raven Johnson, Naomi Chery, Myisha Thasin, Gurjot Nijjar, Katherine Parra, Rachael Ross, Emmanuelle Sanon and Frederick Sekyere), two NYU-SPS undergraduates (Michelle Yip and Danny Vasquez), one University of Maryland undergraduate (Samantha Goldman), one Rutgers undergraduate (Daniel Kourehjan), one Irvington high school student (Annie Horowitz), one Frank McCourt high school student (Angela Vasovic), one Fairfield Prep high school student (Ben Short), two Urban Barcode students (Kristina Chen and Anjali Dutt), two AMNH SRMP students (Madeleine Voiklis and Janelle Chen), and one science educator (Shelley Richards [John Dewey High School]).

Research Cruises

- September 21-26, 2017. Flower Garden Banks National Marine Sanctuary; Cruise DFH-32; *NW GOMEX Expansion Sites I 2017*; Participating Scientist; *R/V Manta & ROV Mohawk*. Invited one City Tech student.
- July 26-August 8, 2016. UNOLS Early Career Co-Chief Scientist Deep-Submergence Training Cruise; Cruise AT-36. Utilized the *DSV Alvin* (9 dives) and *AUV Sentry* to explore deep-sea canyons and methane seeps along the North Atlantic Margin of the United States. The cruise was telepresence enabled.
- July 19-24, 2015. Flower Garden Banks National Marine Sanctuary; Cruise DFH-28; *Stetson Mesophotic Monitoring Cruise 2015*; Participating scientist; *R/V Manta & ROV Mohawk*. Invited one City Tech student.
- May 9-June 11, 2011. The Drake; Cruise 11-03; *Historic perspectives on climate & biogeography from deep-sea corals in the Drake Passage*; Participating scientist; *RVIB Nathaniel B Palmer*.
- September 11-16, 2005. Flower Garden Banks National Marine Sanctuary; Cruise DFH-11; *Flower Garden Banks ROV surveys: ground-truthing bathymetry data and collecting antipatharians for genetic analysis*; Participating scientist; *M/V Spree*.
- August 2-September 4, 2005. New England Seamounts; Cruise 05-03, Leg 2; *Deep North Atlantic Stepping Stones*; Participating scientist; *R/V Ronald Brown & ROVs Hercules + Argus*.

- May 8-24, 2004. New England Seamounts; Cruise 04-04; *Mountains in the Sea II - New England Seamount Chain Expedition*; Participating scientist; *R/V Ronald Brown & ROVs Hercules + Argus*.
- July 11-19, 2003. New England Seamounts; Cruise AT-8; *Mountains in the Sea - Exploring the New England Seamount Chain*; Participating scientist; *R/V Atlantis & DSV Alvin*; **ALVIN DIVE** (Dive 3906, July 18th, 1644m, Bear Seamount).
- May 26-June 17, 2003. New England Seamounts; Cruise AT7-35; *Collaborative Research: Ocean Ventilation Rates and Rapid Climate Change Recorded by Deep-Sea Corals: An Alvin and ABE Program to the New England Seamounts*; Participating scientist; *R/V Atlantis & DSV Alvin*.
- April 26-May 11, 2002. Guaymas Basin; Cruise 07-11; *The Fate of NH₄⁺ in Hydrothermal Plumes*; Participating scientist; *R/V Atlantis & DSV Alvin*; **ALVIN DIVE** (Dive 3778, May 4th, 2011m).
- April 2-8, 2000. Bimini, Bahamas; Saltwater Semester: Rosenstiel School of Marine and Atmospheric Science, University of Miami, FL. Participating scientist; *R/V Coral Reef II*.

NOAA-Funded Research Cruises for Undergraduates

- September 5-10, 2018. Flower Garden Banks National Marine Sanctuary; Cruise DFH-37; *NW GOMEX Expansion Sites II 2018*; *R/V Manta & ROV Mohawk*. Sent two students to collect black corals.
- July 21-26, 2018. Flower Garden Banks National Marine Sanctuary; Cruise DFH-35; *NW GOMEX Expansion Sites I 2018*; *R/V Manta & ROV Mohawk*. Sent two students to collect black corals.
- September 28-October 3, 2017. Flower Garden Banks National Marine Sanctuary; Cruise DFH-33; *NW GOMEX Expansion Sites II 2017*; *R/V Manta & ROV Mohawk*. Sent two students to collect black corals.
- September 21-26, 2017. Flower Garden Banks National Marine Sanctuary; Cruise DFH-32; *NW GOMEX Expansion Sites I 2017*; *R/V Manta & ROV Mohawk*. Sent one student to collect black corals.
- September 3-8, 2016. Flower Garden Banks National Marine Sanctuary; Cruise DFH-30; *Northwestern Gulf of Mexico Cruise 2016*; *R/V Manta & ROV Mohawk*. Sent two students to collect black corals.
- July 19-24, 2015. Flower Garden Banks National Marine Sanctuary; Cruise DFH-28; *Stetson Mesophotic Monitoring Cruise 2015*; *R/V Manta & ROV Mohawk*. Sent one student to collect black corals.

Workshops (Designed & Taught)

- **Black Coral Morphology and Molecular-Based Identification Workshop.** June 2-4, 2015. National Institute of Water & Atmospheric Research (NIWA) in Wellington, New Zealand. Co-instructed by Dr. Dennis Opresko (Smithsonian Institution) and hosted by Di Tracey (NIWA).
- **“(Phylogenetic) Tree Thinking” Workshop.** August 26, 2014. Richard Gilder Graduate School, American Museum of Natural History. Participants: RGGGS PhD candidates and SICG staff.

Workshops (Attended)

- **NGS Summer Course 2015: Analyzing Next-Generation Sequencing Data.** August 10-21, 2015; W.K. Kellogg Biological Station (Michigan State University), Hickory Corners, MI.
- **UNOLS Deep Submergence Science Committee (DeSSC) New-User (Early Career Scientist) Program.** December 13-14, 2014; Golden Gate University, San Francisco, CA.
- **Next Generation Population Genomics for NonModel Taxa: A Hands-on Workshop.** July 23-24, 2013; Cornell University, Ithaca, NY.
- **NESCent (National Evolutionary Synthesis Center) Academy Next-Generation Sequence Analysis Course.** June 11-19, 2012; Durham, NC.
- **Coral Identification Seminar/Workshop.** December 8, 2008; National Institute of Water and Atmospheric Research (NIWA): Wellington, New Zealand.
- **A Short-Course in Taxonomy and Ecology of Gorgonians and Black Corals.** July 23-August 2, 2007; Smithsonian Tropical Research Institute, Bocas del Toro, Panama. Oral presentations. 1) *Order Antipatharia (black corals): Analysis of mitochondrial variation and the development and application of novel genetic markers.* 2) *SEM photomicrographs of deep-sea black coral spines.*

Professional Activities

Moderator

World Oceans Week 2018 - Coral Reefs Panel; June 7, 2018 at The Explorer's Club (New York City)

Panelist

NASA Exobiology Program - Advanced Life (NNH18ZDA001N-EXO); August 5-10, 2018 (San Diego, CA)

Honors

Associate Fellowship: "A Living Laboratory (Brooklyn's Waterfront): Revitalizing General Education for a 21st-Century College of Technology;" a major initiative funded by the U.S. Department of Education's Strengthening Hispanic-Serving Institutions (Title V) program. May 15, 2015: *Awarded first place for the most engaging open pedagogical practices in a course segment or assignment.*

Referee: Peer-Reviewed Journals

Coral Reefs, *Frontiers in Marine Science* (Marine Systematics & Taxonomy), *Gene*, *ICES Journal of Marine Science*, *Journal of the Marine Biological Association of the United Kingdom*, *Limnology and Oceanography*, *Marine Biodiversity*, *Marine Ecology Progress Series*, *Mediterranean Marine Science*, *Mitochondrial DNA*, *Molecular Ecology Resources*, *Molecular Phylogenetics and Evolution*, *Museum of Comparative Zoology at Harvard University*, *The Italian Journal of Zoology*, *Zootaxa*

Referee: Grants and Proposals

AMNH Lerner Gray Marine Research Grants, NOAA's Ocean Exploration & Research (OER), NSF's Research Experiences for Undergraduates (Biology & Physical Sciences), Schmidt Ocean Institute, West Coast & Polar Regions Undersea Research Center

Reviewer: Textbooks

Biology: Life on Earth by Audesirk, Audesirk & Byers (11th Edition)

Invited Seminars / Lectures

- **Smithsonian Institution's National Museum of Natural History.** *Envisioning the future of science at the NMNH through an invertebrate lens.* April 24, 2019.
- **NYU Liberal Studies.** *Molecular and morphological mysteries of deep-sea black corals.* March 11, 2019.
- **Biology on Tap - Commotion Under the Ocean.** The Way Station (Brooklyn, NY). August 15, 2018.
- **AMNH Discovery Room Meet the Scientist Program.** AMNH Discovery Room. June 2, 2018.
- **Unseen Oceans Trivia Night at the AMNH** (part of the World Science Festival). AMNH Hall of Ocean Life. May 31, 2018.
- **39th New York State Marine Education Association's (NYSMEA) Conference.** Kingsborough Community College. May 19, 2018. Keynote speaker.
- **Harvard University** (Cambridge, MA). *"It's just a flesh wound": Minimally-destructive genomics in the deep sea.* Harvard's Soft Robotics Lab. May 4, 2018.
- **New York Taste of Science Festival – Hidden Depths.** Flagship Brewery, Staten Island. April 28, 2018.
- **Wildlife Conservation Society's Hudson Canyon Professional Development Training Course.** New York Aquarium. April 2, 2018.
- **Person, Place, Thing with Randy Cohen** (live podcast). AMNH Linder Theater. March 29, 2018.
- **Milstein Science Series: Ocean Technology.** AMNH Hall of Ocean Life. February 25, 2018.
- **Submerge! Marine Science Festival.** Hudson River Park (Pier 26). September 16, 2017.
- **NYC Atheists Organization.** SLC Conference Center (New York City). \$10 admission. April 27, 2017.
- **AMNH Content Seminar for the Unseen Oceans exhibit.** Lead Curator: John Sparks. April 18, 2017.
- **Exploring New York Waters: Hudson Canyon.** New York Aquarium (Professional Development Course for high school teachers; sponsored by the Wildlife Conservation Society & NY Seascape). April 10, 2017.
- **The Metropolitan Society of Natural Historians: Notes from the Field.** AMNH. December 4, 2016.
- **The Secret Science Club** (Brooklyn, NY). Bell House. September 20, 2016.
- **NYC College of Technology (CUNY)** (Brooklyn, NY). Biological Science Dept. April 4, 2014.
- **Pace University** (Pleasantville, NY), Department of Biology. March 5, 2014.
- **Mercyhurst University** (Erie, PA), Department of Biology. February 26, 2014.
- **California State University Fullerton**, Department of Biological Science. February 19, 2014.

- **Brooklyn College (CUNY)** (Brooklyn, NY), Biology Department. February 5, 2014.
- **Rivier University** (Nashua, NH), Department of Biology. October 19, 2012.
- **AMNH Richard Gilder Graduate School Comparative Biology Seminar Series**. Feb 14, 2011.
- **TRUST Summer Institute in Life Science**. August 10, 2011; Gottesman Center for Science Teaching & Learning (AMNH). *Why is biodiversity important?*
- **Coral: Symbol, Substance & Significance**. October 29-31, 2009; The Graduate School, The City University of New York: NY. Hosted by Initiatives in Art & Culture. *What is a coral?*

Conferences / Symposia / Seminars

- **15th Deep-Sea Biology Symposium**. September 9-14, 2018; Monterey, CA. Poster. *Partnering with the Ocean Genome Legacy to Advance our Understanding of Black Corals (Order Antipatharia)*.
- **4th Annual National Ocean Exploration Forum (Beyond the Ships: 2020-2025)**. October 20-21, 2016. Hosted by The Rockefeller University (NYC). We published a 34-page report based on our discussions on February 23, 2017. Invited by Dr. Alan Curry on 10/06/16.
- **6th International Symposium on Deep-Sea Corals**. September 11-16, 2016; Boston, Massachusetts. Posters. 1) *Molecular characterization of the black coral *Telopathes cf. magna* from deep waters around New Zealand, Antarctica (Ross and Somov Seas) and Hawai'i*. 2) *Molecular characterization of mesophotic black corals (antipatharians) from the NW Gulf of Mexico*.
- **Evolution 2015**. June 26-30, 2015; Guarujá, Brazil. Oral presentation. *Sequencing the genome of *Relicanthus daphneae* (Cnidaria:Anthozoa:Hexacorallia:incerti ordinis)*. Poster. *Phylogenomics of the Anthozoa (Cnidaria): new approaches to long-standing problems*.
- **The Society for Integrative & Comparative Biology (SICB) Annual Meeting**. January 3-7, 2014; Austin, Texas. Oral presentation. *Next-gen sequencing of legacy collections at the American Museum of Natural History*. Poster. *Evaluation of intra- and interspecific variation within the Antarctic sea anemone genus *Actinostola* (Cnidaria: Anthozoa: Actiniaria) using morphology and novel nuclear DNA markers*.
- **Evolution 2013**. June 21-25, 2013; Snowbird, Utah. Oral presentation. *Evaluation of nuclear introns in sea anemones (Cnidaria: Anthozoa: Hexacorallia: Actiniaria)*. Poster. *A nuclear intron reveals population-level variation within deep-sea black corals (Cnidaria: Antipatharia)*.
- **Deep Metazoan Phylogeny 2011: New Data, New Challenges**. October 11-14, 2011; Munich, Germany. Posters. 1) *Anthozoans are characterized by extremely low rates of mitochondrial DNA sequence evolution and variable nuclear markers remain elusive*. 2) *Are sea anemones (Cnidaria, Actiniaria) monophyletic? First phylogenetic higher-level classification for the order*. Abstracts published in *Zitteliana* (Series B30).
- **4th International Symposium on Deep-Sea Corals**. December 1-5, 2008; Wellington, New Zealand. Posters. 1) *Mitochondrial genome studies of the black coral family *Leiopathidae* Haeckel, 1896*. 2) *Deep-sea corals show no evidence of endemism on northwestern Atlantic seamounts*.
- **UL Lafayette Biology Department Seminar**. September 25, 2008. Oral presentation. *Progress in antipatharian (black coral) phylogenetics and mitogenomics*.
- **2008 Cnidarian Tree of Life Annual Meeting**. July 19-24, 2008; Hotel Los Arcos, La Paz, Mexico. Oral presentation. *Progress in antipatharian phylogenetics and mitogenomics*.
- **8th Annual Department of Biology Graduate Student Symposium**. November 16, 2007; University of Louisiana at Lafayette, Lafayette, LA. Oral presentation. *Black coral phylogenetics: utilizing molecular morphometrics of the internal transcribed spacer 2 (ITS2, rDNA)*.
- **7th Annual Department of Biology Graduate Student Symposium**. October 13, 2006; University of Louisiana at Lafayette. Oral presentation. *Analyzing complete mitochondrial genomes: advantages of gene order and genome content when inferring ancient evolutionary relationships*.
- **2006 Cnidarian Tree of Life Annual Meeting**. June 28-29, 2006 at SUNY Stony Brook (NY).
- **Evolution 2006**. June 23-27, 2006; SUNY Stony Brook, Stony Brook, NY. Oral presentation. *Have we discovered a "fountain of variation?" An analysis of non-coding regions within the black coral (Cnidaria: Anthozoa) mitochondrial genome*. Poster. *Deep-sea bamboo corals break rank: Mitochondrial gene order is not conserved among octocorals (Cnidaria: Octocorallia: Isididae)*.

- **3rd International Symposium on Deep-Sea Corals.** November 28-December 2, 2005; Rosenstiel School of Marine and Atmospheric Science, Miami, FL. Oral presentation. *Low sequence variability within anthozoan mitochondrial genomes: Are antipatharian non-coding regions the exception?* Poster. *Distribution and abundance of black corals (Antipatharia) in relation to depth and topography on the New England Seamounts (Northwest Atlantic).*
- **8th Annual Sigma Xi Student Research Symposium** (UL Lafayette Chapter). March 14, 2005; University of Louisiana at Lafayette, Lafayette, LA. Oral presentation (1st place award). *The mitochondrial genome of an antipatharian (black coral) and ceriantharian (tube anemone): Implications for cnidarian phylogeny.*
- **2005 Graduate Student Symposium.** January 28-30, 2005; LUMCON (Louisiana Universities Marine Consortium), Cocodrie, LA. Oral presentation. *Mitochondrial genome of an antipatharian (black coral) & ceriantharian (tube anemone): Implications for cnidarian phylogeny.*
- **5th Annual Dept of Biology Graduate Student Symposium.** October 21-22, 2004; UL Lafayette, Lafayette, LA. Oral presentation (1st place award). *The mitochondrial genome of an antipatharian (black coral) & ceriantharian (tube anemone): Implications for cnidarian phylogeny.*
- **10th Deep-Sea Biology Symposium.** August 25-29, 2003; Southwestern Oregon Community College, Coos Bay, OR. Poster. *Do antipatharians belong in the subclass Ceriantipatharia? Inferring phylogeny from mitochondrial gene order of a deep-sea black coral.*
- **Marine Biology Graduate Student Research Colloquium** (Grice Marine Laboratory). February 21-22, 2003; Department of Natural Resources, Charleston, S.C. Oral presentation. *Sequencing the complete mitochondrial genome of an antipatharian (black coral) and a ceriantharian (tube anemone) for use in phylogenetics of the class Anthozoa.*
- **Annual Meeting of the South Eastern Population Ecology and Genetics Group.** September 20-22, 2002; Duke Marine Laboratory, Beaufort, N.C.

Community Service / Outreach

- AMNH Marine Biology Internship Program: Presentation to 30 students from Frank McCourt HS. 12/19/18.
- Lang Science Program: Presentation to 25 high school students about how to communicate concepts about deep-sea biology through show-&-tell carts in the AMNH's Hall of Ocean Life. 12/14/18.
- Ran a deep-sea themed booth at the AMNH's 25th Annual Family Party (afterhours fundraiser). 10/16/18.
- Lang *Unseen Oceans* Course: Presentation to 40 HS students (How scientists study the ocean). 07/17/18.
- Participated in the opening ceremony of the NY Aquarium's *Ocean Wonders: Sharks!* exhibit. 06/28/18.
- Hosted a live telepresence event that connected audience members at the AMNH's 2016 Annual REU Symposium to scientists on the research vessel *Atlantis* (who were using the submersible *Alvin* to explore deep-sea canyons and seamounts in the NW Atlantic Ocean) and scientists at the University of Rhode Island's Inner Space Center; the latter included Robert Ballard, the founder of the *RMS Titanic*. 08/04/16.
- Presentation & show-and-tell to ~60 2nd grade students and 15 educators from NY Public School 234 in Tribeca. Held in the AMNH's Linder Theater on 4/15/16. Title: Exploring Deep-Sea Coral Communities.
- AMNH's Ocean Adventures Summer Camp. Presentation to 30 2nd and 3rd grade students and 10 educators. Title: Exploring Deep-Sea Coral Communities. 07/16/15, 08/25/15 & 02/16/16.
- Milstein Science Series: Incredible Oceans (in conjunction with the *Life at the Limits* exhibit). Held in the AMNH's Hall of Ocean Life on April 19 from 11:00am-4:30pm. Created and implemented a hands-on activity for >4,500 visitors that featured actual animals from the museum's collection.
- Lang Science Program (AMNH): Presentation to 30 high school students and 5 educators Title: Exploring Deep-Sea Coral Communities. 08/16/12.
- King-Chavez Summer Conservation Academy (San Diego, CA.): Presentation to 20 6-8th grade students. Title: Exploring Deep-Sea Coral Communities. 03/09/12.
- Saltz Internship Program (AMNH): Presentation. Title: What is a coral? 03/21/11.
- Regularly identify illegally imported precious red coral and black coral for the US Fish & Wildlife Service
- Expert adviser in a U.S. Department of Justice case that convicted two individuals of illegally trading CITES-protected black corals (www.justice.gov/opa/pr/taiwanese-couple-sentenced-prison-illegally-trading-protected-black-coral)
- Judge at the NYC Science & Engineering Fair (NYCSEF). Finals round. Held annually at the AMNH.

- Judge at NYCSEF. Preliminary round. Held annually at The City College of NY (CUNY).
- Judge at the 47th Annual Fall Metropolitan Association of College & University Biologists (MACUB) Conference. Held annually at Molloy College in Rockville Centre, NY.

City Tech Library Exhibits

- Showcased the entire range of undergraduate research at City Tech; June - September 2018
- Showcased undergraduate research cruises; March - April 2017

Skills / Abilities

Next-Generation DNA Sequencing

- 2011-2015: Operated a Roche 454 GS Junior for the AMNH (wet chemistry and bioinformatic pipeline; included whole genome shotguns, transcriptomics, amplicon libraries & multiplexed mitogenomes)

Field / Lab

- SCUBA diving (PADI: advanced open-water certified, NAUI: nitrox certified).
- Knowledge of basic lab chemistry, reagent preparation, histological techniques, DNA extraction, polymerase chain reaction, thermal cyclers, gel electrophoresis, fluorometry, PCR purification, cycle sequencing, sequencing using Applied Biosystems/Beckman chemistry, gas chromatography, high performance liquid chromatography, spectrometry, & GC-mass spectrometry.
- Experienced in RNA isolation, first/second strand cDNA synthesis and cloning using Invitrogen's TOPO TA system (blue/white colony screening using ampicillin selection).
- Proficient using the Agilent 2100 BioAnalyzer.
- Can operate traditional Sanger sequencers (Beckman Coulter CEQ 8000 and ABI 3100/3130xl), Next-Gen sequencers (e.g., 454) and scanning electron microscopes (Hitachi S-3000N Thermionic; AMRAY 1810).

Software

- Proficient on both Mac and PC operating systems; MS Word, Excel, and PowerPoint; File Maker Pro 5; ABI and Beckman Coulter CEQ 8000 Genetic Analysis System software; various phylogenetic analysis software programs (e.g., Sequencher, SeqApp, Se-Al, BioEdit, PAUP*, Clustal-X, MAFFT, Muscle, MrBayes, Phylobayes, RAxML, PhyML) and databases (GenBank).
- Intermediate knowledge of the Unix command line and R.

Certifications

- Responsible Conduct of Research (RCR) for CUNY Researchers. Online coursework provided by the Collaborative Institutional Training Initiative (CITI Program) - Univ of Miami. Completed 12/01/2015.

Pertinent Past Employment

- **The Dallas World Aquarium, Aquarist and Life Support** (May - August 2000 and 2001)
- **U.S. Army Corps of Engineers - Lewisville Aquatic Ecosystem Research Facility, Restoration and Maintenance** (December 1998 - January 1999, May - August 1999)

Research-Related References

Dr. Estefanía Rodríguez <i>Postdoctoral Advisor</i>	American Museum of Natural History Division of Invertebrate Zoology	(212) 769-5244 erodriguez@amnh.org
Dr. Mark Siddall <i>Mentor / Collaborator</i>	American Museum of Natural History Division of Invertebrate Zoology	(212) 769-5638 siddall@amnh.org
Dr. Rob DeSalle <i>Mentor / Collaborator</i>	American Museum of Natural History Sackler Institute for Comparative Genomics	(212) 769-5670 desalle@amnh.org

Professional Reference

Dr. Meg Daly <i>Mentor / Collaborator</i>	The Ohio State University Dept of Evol, Ecol & Organismal Biology	(614) 247-8412 daly.66@osu.edu
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Teaching Reference

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