

Curriculum Vitae

MERCER ROBERT BRÜGLER

American Museum of Natural History
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EDUCATIONAL BACKGROUND

American Museum of Natural History (AMNH): New York, NY (January 2011 - present)

Gerstner Scholar and Postdoctoral Fellow, AMNH Molecular Systematics Laboratory

Mentor: Dr. Estefanía Rodríguez (Assistant curator of the Cnidaria)

Project: Development of genetic tools for sea anemones: delineating species boundaries using novel nuclear markers & phylogenetic reconstruction of the order Actiniaria using newly-sequenced complete mitochondrial genomes

University of Louisiana at Lafayette: Lafayette, LA (2004-2011)

Doctor of Philosophy, Environmental and Evolutionary Biology (GPA: 4.00)

Dissertation: Molecular evolution in black corals (Cnidaria: Anthozoa: Hexacorallia):

Implications for antipatharian systematics (<http://gradworks.umi.com/34/59/3459755.html>)

Advisor: Dr. Scott France

College of Charleston: Charleston, SC (2001-2004)

Master of Science, Marine Science/Biology (GPA: 3.81)

Thesis: The complete mitochondrial DNA sequence of the black coral *Chrysopathes formosa* (Antipatharia) and six non-contiguous mitochondrial genes of the tube anemone

Ceriantheopsis americanus (Ceriantharia): Implications for cnidarian phylogeny

Advisor: Dr. Scott France

University of Miami: Coral Gables, Florida (1997-2001)

Bachelor of Science, Marine Science/Biology, Chemistry minor (GPA: 3.77)

Saltwater Semester Project: Diurnal effects on fish abundance and diversity in the seagrass beds of Bimini, Bahamas, and Long Key, Florida (*unpublished*)

RESEARCH INTERESTS

- Deep-sea biology
- Evolution and diversity of marine invertebrates, with particular interest in cnidarians
- Effects of dispersal and gene flow on the genetic structure of deep-sea populations
 - Current focus: extreme environments (Antarctica; chemosynthetic vents and seeps)
- Molecular systematics and evolutionary history of the Class Anthozoa (Phylum Cnidaria)
 - Current focus: sea anemones (actinarians) and black corals (antipatharians)
- Evolution of mitochondrial (mt) gene order, gene content, and genome architecture
- Tools: morphology, mt/nuclear DNA, molecular morphometrics, gene order, next-gen sequencing
- Specific information regarding my postdoctoral research at the AMNH can be found at:
http://rggs.amnh.org/pages/academics_and_research/gerstner_scholars/gerstner_scholars

PUBLICATIONS

- 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.
- 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.
- 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.
- Daly M, **Brugler MR**, Cartwright P, Collins AG, Dawson MN, Fautin DG, France SC, McFadden CS, Opresko DM, Rodriguez 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.
- PUBLICATIONS (accepted or in prep)**
- MacIsaac KG, Best M, Kenchington ELR, Anstey LJ, Jordan T, **Brugler MR**, *accepted with minor revisions*. *Telopathes magna* gen. nov., spec. nov. (Cnidaria: Anthozoa: Antipatharia: Schizopathidae) from the continental slope off Nova Scotia, western North Atlantic. *Zootaxa*.
- Sanchez JA, **Brugler MR**, Miller K, Umana C, Dueñas LF, Opresko DM, *in prep*. A phylogenetic reconstruction of the order Antipatharia (black corals) based on the predicted secondary structure of nuclear ITS2.
- Brugler MR**, France SC, Opresko DM, *in prep*. A historical review of the order Antipatharia with presentation of novel DNA-based phylogenetic reconstructions: Implications for black coral systematics (Cnidaria: Anthozoa: Hexacorallia).
- Brugler MR**, Grajales A, Rodríguez E, *in prep*. Distribution and phylogenetic signal of a novel mitochondrial group I intron encoding a putative homing endonuclease within the order Actiniaria.

Brugler MR, González-Muñoz RE, Rodríguez E, Simoes N, *in prep.* Evaluation of intraspecific variation within the sea anemone *Phymanthus crucifer* (Cnidaria: Anthozoa: Actiniaria) using morphology and novel nuclear DNA markers.

Rodríguez E, Barbeitos MS, **Brugler MR**, Crowley L, Daly M, Grajales A, *in prep.* Are sea anemones (Cnidaria, Actiniaria) monophyletic? A new order of hexacorals and the first phylogenetic higher-level classification for the order Actiniaria.

Thoma JN, **Brugler MR**, France SC, *in prep.* The complete mitochondrial genome of the scleraxonian *Paragorgia coralloides* (Cnidaria: Anthozoa: Octocorallia): Novel genome rearrangement via intramitochondrial recombination.

Opresko DM, **Brugler MR**, *in prep.* Reevaluation of the family Aphanipathidae (Cnidaria: Anthozoa: Antipatharia) based on morphological and molecular data.

Brugler MR, France SC, Opresko DM, *in prep.* Mitochondrial genomics of the black coral family Leiopathidae Haeckel, 1896.

Rodríguez E, **Brugler MR**, Grajales A, Erby M, Lara A, *in prep.* Elucidating the evolutionary history of sea anemones collected from newly discovered hydrothermal vents in Antarctica.

Grajales A, **Brugler MR**, Rodríguez E, *in prep.* Anemone-specific primers for amplification of the nuclear ribosomal cistron in hosts that contain *Symbiodinium*, a dinoflagellate symbiont.

Brugler MR, Lara A, Rodríguez E, *in prep.* Evaluation of intraspecific variation within the deep-sea / Antarctic sea anemone genus *Actinostola* (Cnidaria: Anthozoa: Actiniaria) using morphology and novel nuclear DNA markers.

GRANTS / FELLOWSHIPS

- Grant from the Canadian Department of Fisheries and Oceans. February 15, 2012. \$1,828.
- Gerstner Family Foundation Scholarship (AMNH). March 1, 2011. \$50,000
- Two-year Postdoctoral Fellowship (AMNH). January 18, 2011. \$42,000 per year
- Grant to attend the 4th Int'l Symposium on Deep-Sea Corals: Wellington, New Zealand. NZ \$4,000
- Subcontract from the Continental Shelf Associates (contact: S. Viada). Title: Mitochondrial genome studies of the black coral *Leiopathes*. January 11, 2008. \$4,570
- Louisiana's Board of Regent's (BoR) NSF EPSCoR Links with Industry, Research Centers, and National Laboratories (LINK) program. June 1, 2007. \$2,000. NSF(2007)-LINK-24
- Louisiana BoR 4-year Support Fund Fellowship. March 1, 2004. LEQSF(2004-2009)-GF-21
- Slocum-Lunz Foundation Grant. May 19, 2003. \$600
- Joanna Deepwater Fellowship Award. April 8, 2003. \$3,033

NEXT-GENERATION SEQUENCING

- Operate a Roche 454 GS Junior for the AMNH (wet chemistry and bioinformatic pipeline)
-Includes whole genome shotguns, transcriptomics, amplicon libraries & multiplexed mt genomes
- Collaborating with PacBio, Illumina, Weill Cornell Medical College and the Sackler Institute for Comparative Genomics to sequence the complete genome and full transcriptome of a bed bug, cockroach, dragonfly, European medicinal leech, King bird-of-paradise, precious pink coral (*Corallium*), Antarctic sea anemone and a representative of a new order of Anthozoa (Cnidaria)

- Developed a ‘Next-Generation Sequencing’ course (Spring 2013) with Drs. Mark Siddall (Curator of Annelida and Protozoa) and Rob DeSalle (Curator of Entomology and Editor-in-Chief of *Mitochondrial DNA*) for the AMNH’s Richard Gilder Graduate School PhD program (includes theory, literature discussions, wet chemistry [DNA/RNA extraction, cDNA library construction, cloning, 454 sample prep and loading] and creating bioinformatic pipelines)
-Lead instructor; syllabus and budget available upon request

TEACHING EXPERIENCE

Full Instructor (UL Lafayette) - ‘Biological Principles and Issues I’ for non-majors (BIOL 121)

- Fall 2010 (150 students), Summer 2009 (85 students) and Spring 2009 (259 students)
- Textbook: *Biology, Life on Earth with Physiology* (8th & 9th ed.) by Audesirk, Audesirk and Byers
- Contacts: Pegge Alciatore (pla7994@louisiana.edu) and Lewis Deaton (led9784@louisiana.edu)

Full Instructor (UL Lafayette) - ‘Fundamentals of Biology I’ for biology majors (BIOL 110)

- Fall 2009 (305 students)
- Textbook: *Biology* (1st ed.) by Brooker, Widmaier, Graham and Stiling
- Contact: Pegge Alciatore

Teaching Assistant (UL Lafayette) - Advanced Invertebrate Zoology Laboratory (BIOL 319/519)

- Fall 2008 and 2006
- Contacts: Drs. Scott France (france@louisiana.edu) and Raymond Bauer (rtbauer@louisiana.edu)

Teaching Assistant (College of Charleston) - Human Physiology Laboratory (BIOL 201)

- Fall 2001 through Spring 2003
- Contact: Dr. Duncan Munro (munrod@cofc.edu)

Teaching Assistant (University of Miami) - Evolution and Biodiversity Workshop (BIOL 374)

- Fall 1998
- Contact: Dr. Dana Krempels (dana@miami.edu)

TRAINING / MENTORING EXPERIENCE

- Fall 2012-Spring 2013: Hosting two NYC high school students (Alexandria Tricoche and Nadia Bahadur) as part of the AMNH’s NSF-funded Science Research Mentoring Program.
- Taught REU student Ilana Arbisser (Univ. Pennsylvania) how to sequence the complete mitochondrial genome of *Allonauutilus scrobiculatus* on the AMNH’s 454 GS Junior
- Summer 2012: Hosted two NSF-funded REU students (Matthew Erby [Univ. of Rochester]; Adolfo Lara [Univ. of Houston Downtown]) and a NYC high school student (Ashley Paynter).
- Taught genetic techniques and analysis of molecular data to Mary Allison Manning (undergraduate, UL Lafayette [ULL]), Didi Kpaduwa (undergraduate, ULL), Steve Allen (technician, ULL), Jana Thoma (graduate student, ULL), Eric Pante (graduate student, ULL), Joris van der Ham (postdoctorate, ULL), Marisol Mendoza (visiting undergraduate from the Benemérita Universidad Autónoma de Puebla [Mexico]; AMNH) and Ricardo E. González-Muñoz (visiting PhD student from the Universidad Nacional Autónoma de México [UNAM]; AMNH).
- Training has directly resulted in two peer-reviewed primary literature articles: Thoma et al. (2009) and Van der Ham et al. (2009).

FIELD EXPERIENCE

- The Drake; Cruise 11-03; ‘Historic perspectives on climate & biogeography from deep-sea corals in the Drake Passage;’ Participating scientist; *R/V Nathaniel B Palmer*; May 9-June 11, 2011.
- 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*; September 11-16, 2005.
- New England Seamounts; Cruise 05-03, Leg 2; ‘Deep North Atlantic Stepping Stones;’ Participating scientist; *R/V Ronald Brown / ROVs Hercules & Argus*; August 2-September 4, 2005.
- 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*; May 8-24, 2004.
- 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, 1644 meters depth, Bear Seamount); July 11-19, 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*; May 26-June 17, 2003.
- Guaymas Basin; Cruise 07, Leg 11; ‘The Fate of NH_4^+ in Hydrothermal Plumes;’ Participating scientist; *R/V Atlantis / DSV Alvin*; **Alvin dive** (Dive 3778, May 4th, 2011 meters depth); April 26-May 11, 2002.
- Bimini, Bahamas; ‘Saltwater Semester’ undergraduate project: Rosenstiel School of Marine and Atmospheric Science, University of Miami, Florida. Participating scientist; *R/V Coral Reef II*; April 2-8, 2000.

PROFESSIONAL ACTIVITIES

REFEREE (journals)

- ICES Journal of Marine Science
- Marine Ecology Progress Series
- Molecular Ecology Resources
- The Italian Journal of Zoology
- Molecular Phylogenetics and Evolution
- Zootaxa

REFEREE (grants and proposals)

- AMNH Lerner Gray Marine Research Grants
- West Coast & Polar Regions Undersea Research Center
- NSF’s Research Experiences for Undergraduates (REU), Biology & Physical Sciences Programs

INVITED DEPARTMENTAL SEMINARS

- **Rivier University** (Nashua, NH), Department of Biology Seminar. October 19, 2012.
Oral presentation: *Molecular evolution in black corals and sea anemones, with an introduction to the world’s largest environment – the deep sea*
- **Richard Gilder Graduate School’s Comparative Biology Seminar Series**. February 14, 2011.
Oral presentation: *Molecular evolution in black corals (Cnidaria: Anthozoa: Hexacorallia: Antipatharia)*

INVITED LECTURES

- **TRUST Summer Institute in Life Science** (included teachers from Brooklyn, Lehman & Hunter College). Held Aug. 10, 2011 at the Gottesman Center for Science Teaching & Learning (AMNH).
Oral presentation: *Why is biodiversity important?*

- **Coral: Symbol, Substance & Significance.** Held from October 29-31, 2009 at The Graduate School, The City University of New York: NY. Hosted by Initiatives in Art & Culture.
Oral presentation: *What is a coral?*

PRESENTATIONS / MEETINGS / WORKSHOPS / LECTURES

- **NESCent (National Evolutionary Synthesis Center) Academy Next-Generation Sequence Analysis Course.** Held from June 11-19, 2012 in Durham, NC.
Developed bioinformatic pipelines for 454 and Illumina sequence data
- **Deep Metazoan Phylogeny 2011: New Data, New Challenges.** Held from October 11-14, 2011 in Munich, Germany.
Poster presentation: *Anthozoans are characterized by extremely low rates of mitochondrial DNA sequence evolution and variable nuclear markers remain elusive*
- **Coral Identification Seminar/Workshop.** Held on December 8, 2008 at the National Institute of Water and Atmospheric Research (NIWA): Wellington, New Zealand. Speakers included S. Cairns (Scleractinia and Stylasteridae), D. Opresko and T. Molodtsova (Antipatharia), & J. Sanchez, L. Watling, A. Matsumoto and S. France (Octocorallia).
- **2008 4th International Symposium on Deep-Sea Corals.** Held from December 1-5, 2008 in Wellington, New Zealand, and hosted by NIWA.
Poster presentations:
 - 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* (co-author with Thoma JN, Pante E, and France SC)
- **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.** Held from July 19-24, 2008 at the Hotel Los Arcos: La Paz, Mexico.
Oral presentation: *Progress in antipatharian phylogenetics and mitogenomics*
- **8th Annual Department of Biology Graduate Student Symposium.** Held on November 16, 2007 at the University of Louisiana at Lafayette: Lafayette, LA.
Oral presentation: *Black coral phylogenetics: utilizing molecular morphometrics of the internal transcribed spacer 2 (ITS2, rDNA)*
- **A Short-Course in Taxonomy and Ecology of Gorgonians and Black Corals.** Held from July 23-August 2, 2007 at the Smithsonian Tropical Research Institute's Bocas del Toro research station: Bocas del Toro, Panama; hosted by Dr. Rachel Collin (collinr@si.edu).
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*
- **7th Annual Department of Biology Graduate Student Symposium.** Held on October 13, 2006 at the University of Louisiana at Lafayette: Lafayette, LA.
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.** Held from June 28-29, 2006 at SUNY Stony Brook: Stony Brook, NY.

- **2006 Evolution.** Held from June 23-27, 2006 at SUNY Stony Brook: Stony Brook, NY.
 Poster presentation (co-author): *Deep-sea bamboo corals break rank: Mitochondrial gene order is not conserved among octocorals (Cnidaria Anthozoa: Octocorallia: Isididae)*
 Oral presentation: *Have we discovered a "fountain of variation?" An analysis of non-coding regions within the black coral (Cnidaria: Anthozoa) mitochondrial genome*
- **2005 3rd International Symposium on Deep-Sea Corals.** Held from November 28-December 2, 2005 at the Rosenstiel School of Marine and Atmospheric Science: Miami, FL.
 Poster presentation (co-author): *Distribution and abundance of black corals (Antipatharia) in relation to depth and topography on the New England Seamounts (Northwest Atlantic)*
 Oral presentation (co-author): *Low sequence variability within anthozoan mitochondrial genomes: Are antipatharian non-coding regions the exception?*
- **8th Annual Sigma Xi Student Research Symposium** (UL Lafayette Chapter). Held on March 14, 2005 at the University of Louisiana at Lafayette: Lafayette, LA.
 Oral presentation: *The mitochondrial genome of an antipatharian (black coral) and ceriantharian (tube anemone): Implications for Cnidarian phylogeny* (received 1st place award)
- **2005 Graduate Student Symposium.** Held from January 28-30, 2005 at LUMCON (Louisiana Universities Marine Consortium): Cocodrie, LA.
 Oral presentation: *The mitochondrial genome of an antipatharian (black coral) and ceriantharian (tube anemone): Implications for Cnidarian phylogeny*
- **5th Annual Department of Biology Graduate Student Symposium.** Held from October 21-22, 2004 at the University of Louisiana at Lafayette: Lafayette, LA.
 Oral presentation: *The mitochondrial genome of an antipatharian (black coral) and ceriantharian (tube anemone): Implications for Cnidarian phylogeny* (received 1st place award)
- **10th Deep-Sea Biology Symposium.** Held from August 25-29, 2003 at Southwestern Oregon Community College: Coos Bay, OR.
 Poster presentation: *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** (Graduate Program in Marine Biology, College of Charleston, Grice Marine Laboratory). Held from February 21-22, 2003 at the 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.** Held from September 20-22, 2002 at Duke's Marine Laboratory: Beaufort, N.C.
 Oral presentation (co-author): France SC, LePard A, Barkes MC, Hoover L, Brugler MR, College of Charleston: Charleston, S.C.
Analyses of mitochondrial genes of deep-sea corals: low mutation rates and conserved ORF provide evidence for a functional DNA mismatch repair gene

RESEARCH EXPERIENCE

Research Assistant (UL Lafayette) - Spring 2010; Summer and Spring 2004

-*Job Description:* Performing molecular work on deep-sea anthozoans for Dr. Scott France

Research Assistant (College of Charleston's Grice Marine Laboratory) - Fall 2003

-*Job Description:* Maintaining Hollings Marine Lab project database and Grice Marine Lab wet-lab

-Contact: Dr. Louis Burnett (burnettl@cofc.edu)

Research Assistant (College of Charleston's Grice Marine Laboratory) - Summer 2003

-*Job Description:* Performing molecular work on deep-sea anthozoans for Dr. Scott France

MUSEUM RESEARCH EXPERIENCE

- National Institute of Water and Atmospheric Research (NIWA) - Invertebrate Collection: Wellington, New Zealand. Priority: species identifications and subsampling for genetic voucher preservation. Dec. 6-9, 2008 (funded by sponsors of the 4th Int'l Symposium on Deep-Sea Corals)
- Smithsonian Institution's National Museum of Natural History: Washington, D.C. Priority: species descriptions and SEM analyses of black corals. June 12-21, 2008 (funded by Continental Shelf Associates) and June 16-July 2, 2007 (funded by the LA BoR EPSCoR LINK grant).

COMMUNITY SERVICE / OUTREACH

- AMNH Educator Evening. Engaged 400+ NYC teachers in table conversations related to a new exhibit entitled 'Creatures of Light: Nature's Bioluminescence.' September 28, 2012.
- Lang Science Program (AMNH): Oral presentation to 30 high school students and 5 educators. Title: Exploring Deep-Sea Coral Communities. August 16, 2012.
- King-Chavez Summer Conservation Academy (San Diego, CA.): Oral presentation to 20 6-8th grade students. Title: Exploring Deep-Sea Coral Communities. March 9, 2012.
- Invited evaluator. Richard Gilder Graduate School Comparative Biology Ph.D. Program's Third Annual Student Symposium. Held in the Linder Theater at the AMNH on September 22, 2011.
- Behind-the-scenes in the Invertebrate Zoology Department: Science-at-work tour and luncheon (AMNH). Oral presentation to 22 donors. Presentation title: What are sea anemones? May 4, 2011.
- Saltz Internship Program (AMNH): Oral presentation to 15 high school interns. Title: What is a coral? March 21, 2011.
- Served as an expert adviser in a U.S. Department of Justice case that convicted two individuals of illegally trading CITES-protected black corals (<http://www.justice.gov/opa/pr/2010/June/10-enrd-733.html>)
- Milton Elementary/Middle School (Lafayette, LA.): Oral presentation to 200+ 7th and 8th grade students. Title: Exploring Deep-Sea Coral Communities. April 4, 2008.
- Louisiana Region VI Science Fair Judge (Environmental Science, senior division). March 1, 2008.
- Comeaux High School 11th grade science fair judge (Lafayette, LA.). February 15, 2008.
- Provided three oral presentations to 10th-grade science classes (Lafayette High School, Lafayette, LA.). Title: Exploring Deep-Sea Coral Communities. December 11, 2007.
- Hosted three 10th grade high school students from Comeaux High School (Lafayette, LA.). They loaded, ran, and visualized DNA on an agarose gel, viewed a PowerPoint presentation on the deep-sea, and were introduced to deep-sea invertebrates, with emphasis on corals. April 25, 2007.
- Louisiana Region VI Science Fair Judge (Cellular & Molecular Biology, junior & senior division). March 3, 2007.
- Oral presentation on the deep-sea environment, Comeaux High School biology & chemistry classes, grades 11-12, Lafayette, LA. December 4, 2006.
- Louisiana Region VI Science Fair Judge (Environmental Science, senior division, grades 9-12). March 4, 2006.
- Designed and led the 'Disease Detective' event for the 2005 Science Olympiad held at UL Lafayette. February 19, 2005.
- Hosted an 8th grade student (Nathaniel Faulk) from L.J. Alleman Middle School; introduced Nathaniel to deep-sea corals and basic molecular lab techniques. February 4, 2005.

MEMBERSHIPS / ASSOCIATIONS

- **College of Charleston: Charleston, South Carolina:** Sigma Xi - The Scientific Research Society
- **University of Miami: Coral Gables, Florida:** Honors Program, Resident Assistant (Stanford Residential College), Mu Alpha Theta (Freshman Honor Society), Golden Key National Honor Society, Rho Rho Rho Marine Science Honor Society, Phi Kappa Phi National Honor Society

JOURNAL SUBSCRIPTIONS

Nature, Science, Evolution, Systematic Biology, American Scientist, Marine Technology Reporter

RELEVANT COURSEWORK

DOCTORAL DEGREE

Advanced Microscopy (SEM), Advanced Problems in Zoology, Deep-Sea Biology, Environmental Change (Coastal Plant Ecology), Evolutionary Ecology, Evolutionary Processes, Molecular Biology, Molecular Evolution, Statistical Ecology, Analytical Techniques, Systematic Methods

MASTER'S DEGREE

Biometry, Ecology of Marine Organisms, Graduate Core Seminar, Marine Invertebrate Zoology, Physical Oceanography, Physiology and Cell Biology of Marine Organisms, Population Genetics, Bioethics, Deep-Sea Biology, and Evolution of Marine Diseases

SKILLS / ABILITIES

FIELD / LAB

- SCUBA diving (PADI: advanced open-water certified, NAUI: nitrox certified).
- Knowledge of basic lab chemistry, reagent preparation, DNA extraction and isolation of animal tissue, polymerase chain reaction (PCR), thermal cyclers, gel electrophoresis, fluorometry, PCR purification, cycle sequencing, DNA sequencing using Applied Biosystems (ABI) and Beckman chemistry, gas chromatography (GC), high pressure/performance liquid chromatography (HPLC), spectrometry, and 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 (RNA 6000 Nano & High Sensitivity DNA kits).
- Can operate traditional Sanger sequencers (Beckman Coulter CEQ 8000 and ABI 3100/3130xl) and scanning electron microscopes (Hitachi S-3000N Thermionic SEM; 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).
- Basic knowledge of the Unix command line.

PERTINANT PAST EMPLOYMENT

The Dallas World Aquarium, *Aquarist and Life Support* (May - August, 2000 and 2001)
Contact: Daryl Richardson, 1801 North Griffin, Dallas, TX. 75202; (214) 720-2224

U.S. Army Corps of Engineers - Lewisville Aquatic Ecosystem Research Facility, *Restoration and Maintenance* (December, 1998 - January, 1999 and May - August, 1999)
Contact: Michael Smart, RR3 Box 446, Lewisville, TX. 75056; (972) 436-2215

RESEARCH-RELATED REFERENCES

Dr. Estefanía Rodríguez American Museum of Natural History (212) 769-5244
Postdoctoral Advisor Division of Invertebrate Zoology erodriguez@amnh.org
Central Park West at 79th Street
New York, NY. 10024

Dr. Mark Siddall American Museum of Natural History (212) 769-5638
Next-Gen Sequencing Mentor Division of Invertebrate Zoology siddall@amnh.org

Dr. Rob DeSalle American Museum of Natural History (212) 769-5670
Mentor / Collaborator Sackler Institute for Comparative Genomics desalle@amnh.org

TEACHING REFERENCE

Dr. Pegge Alciatore University of Louisiana at Lafayette (337) 482-5234
Assistant Department Head / Dept. of Biology - Billeaud Hall pla7994@louisiana.edu
Supervisor for BIOL110 & 121 P.O. Box 42451
Lafayette, LA. 70504

DISSERTATION CHAPTERS

- Examination of the level of genetic variation in the black coral mitochondrial (mt) genome using sequence data from the two longest intergenic regions and *cox1*
 - Anthozoans in general have shown unusually slow mtDNA evolution; however, antipatharian mtDNA has not been surveyed
- Utilization of the mt sequences obtained from the first objective, in addition to sequence data from the complete nuclear rDNA cistron (18S-ITS1-5.8S-ITS2-28S), to construct a phylogeny of the order Antipatharia
- Development of novel species-specific genetic markers for inter- and intraspecific level resolution
 - Little is currently known about the genetic population structure of deep-sea corals and the extent to which they maintain interbreeding populations
- Morphological descriptions of novel deep-sea taxa
- Video analysis of deep-diving submersible transect data to characterize and subsequently predict the distribution and abundance of deep-sea corals in relation to habitat and environmental variables
- Sequencing of six complete *Leiopathes* (black coral) mt genomes to characterize genetic variation at the whole genome level (as compared to single gene sequences) and determine what degree of genetic variability correlates with morphologically-defined species