FRANK JAMES STEWART

ADDRESS

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PROFESSIONAL

Assistant Professor, School of Biology, Georgia Institute of Technology, Jan. 2011
Postdoctoral associate, Massachusetts Institute of Technology, 2008-2010

EDUCATION

Ph.D. Harvard University, Biology, 2008
A.M. Harvard University, Biology, 2005
M.S. University of Nevada-Reno, Environmental Science, 2002
B.A. Middlebury College, Biology, minor in Religion, summa cum laude, 2000

FELLOWSHIPS AND HONORS

Sloan Fellowship – Ocean Sciences, 2012
Class of 1969 Teaching Fellow, Georgia Tech, 2011
Harvard NSF IGERT Fellowship - Biomechanics, 2007
NIH Genetics Training Grant, 2003-2005
Phi Kappa Phi induction, 2002
NASA Spacegrant Fellowship, 2001-2002
Governor Kenny Guinn Environmental Research Fellowship, 2001-2002
Outstanding Student Poster Award - 2001 ASLO Aquatic Sciences Meeting, 2001
Sierra Pacific Fellowship, 2000-2001
Phi Beta Kappa induction, 2000
Barry Goldwater Scholarship, 1999-2000
HHMI Undergraduate Research Fellowship, 1998
Paul W. Ward Memorial Writing Award, Honorable Mention, Middlebury College, 1997

RESEARCH INTERESTS

Marine microbiology and deep-sea biology
Marine oxygen minimum zones
Genome evolution and ecology of microbial symbioses
Functional diversity and gene expression in natural microbial communities
Molecular evolution through genomics

RESEARCH EXPERIENCE

Postdoctoral Associate, Civil and Environmental Engineering Department, MIT (advisor: Ed DeLong), 1) Meta-transcriptomics of bacterioplankton from an Oxygen Minimum Zone in the eastern South Pacific, 2) Sample-specific methods for rRNA subtraction in environmental metatranscriptomics

Ph.D Student, Organismic and Evolutionary Biology Department, Harvard University (advisor: Colleen Cavanaugh), Thesis: "Evolution of chemosynthetic endosymbionts of deep-sea clams," 2003-2008

Lab Technician, Microbial Systems Laboratory, Desert Research Institute, PI: Christian H. Fritsen and Alison E. Murray, Project: DGGE/clone library analysis of sea ice prokaryotic diversity, Jan-Aug 2003

M.S. Student, Microbial Systems Laboratory, Desert Research Institute (advisor: C.H. Fritsen), Project: "Winter Distribution and Activities of Sea Ice Microbial Communities in the Western Antarctic Peninsula Region," Southern Ocean Global Ocean Ecosystems Dynamics (SO GLOBEC) program, 2000-2002

Research Assistant, Crary Science Laboratory, McMurdo Station, Antarctica, PI: C.H. Fritsen, Project: "Microbial Life within the Extreme Environment Posed by Permanent Antarctic Lake Ice," Life in Extreme Environments (LExEn) Project - NSF, Dec 1999-Feb 2000

REU Intern, Microbial Systems Laboratory, Desert Research Institute, PI: C.H. Fritsen, Project: enumeration and microscopy of sea ice bacteria, summer 1999

HHMI Intern, Biology Department, Middlebury College, PI: Matthew Dick, Primary project: scanning electron microscopy of Bering Sea bryozoans, summer 2008

TEACHING EXPERIENCE

Microbial Symbiosis as Biological Innovation, BIOL 4083, Georgia Tech, 2012-13 (spring)

Introductory Microbiology, BIOL 3380, Georgia Tech, 2011-13 (fall)

Introductory Microbiology lab, BIOL 3381, Georgia Tech, 2012 (fall)

Symbiomics Field Workshop, HYDRA Institute of Marine Science, Elba, Spring 2012

Biology of Symbiosis, OEB 123, Harvard University, Teaching Fellow, 2007

Topics in Organismic and Evolutionary Biology, OEB 399, Harvard University, Teaching Fellow, 2006

Genetics and Genomics, BS 50, Harvard University, Teaching Fellow, 2005

Harvard Microbial Sciences Initiative - Summer Teachers Workshop, Lab Instructor, 2007, 2008

Aquatic Ecology, University of Nevada-Reno, Lab Instructor, 2002

Genetics, Genomics, and Evolution, Life Sciences 1b, Harvard University, Grader, 2007, 2008

OCEANOGRAPHIC CRUISES

R/V New Horizon, OMZ NSF project, Eastern Tropical North Pacific OMZ, 2013, 2014
R/V Cape Hatteras, OMZ NSF project, Louisiana Shelf, Gulf of Mexico, 2012
R/V Vidal Gormaz, Agouron-OMZ project, eastern South Pacific, Chilean coast, 2010
R/V Vidal Gormaz, Agouron-OMZ project, eastern South Pacific, Chilean coast, 2009
R/V Atlantis, "Extreme 2004" cruise, East Pacific Rise, 2004
R/V Atlantis, "Extreme 2003" cruise, East Pacific Rise, 2003
R/V Nathaniel B. Palmer, SO GLOBEC program, Western Antarctic Peninsula, 2002
R/V Nathaniel B. Palmer, SO GLOBEC program, Western Antarctic Peninsula, 2001
R/V Laurence M. Gould, SO GLOBEC program, Western Antarctic Peninsula, 2001
F/V *Arcturas,* NMFS bottom-fish/invertebrate trawl survey, Bering sea, 1998

FIELD EXPERIENCE

Benthic invertebrate sampling, *Solemya* sp., US Atlantic coast, summer 2005, 2006

Monthly periphyton sampling, Truckee River Biomass Monitoring (TRBM) project, 2000-2001

Terrestrial lake ice sampling, LExEN project, McMurdo Dry Valleys, Antarctica, 1999-2000

PUBLICATIONS

Parris DJ, Ganesh S, Edgcomb VP, DeLong EF, **Stewart FJ**. 2014. Microbial eukaryote diversity in the marine oxygen minimum zone off northern Chile. Frontiers in Microbiology. *in press.*

Dalsgaard T, **Stewart FJ,** Thamdrup B, De Brabandere L, Revsbech NP, Ulloa O, Canfield DE, DeLong EF. Oxygen at nanomolar levels reversibly suppresses process rates and gene expression of anammox and denitrification in the oxygen minimum zone off northern Chile. mBio. *In press.*

Dmytrenko O, Russel SL, Loo WT, Fontanez KM, Liao L, Roeselers G, Sharma R, **Stewart FJ**, Newton ILG, Woyke T, Wu D, Lang JM, Eisen JA, Cavanaugh CM. The genome of the intracellular bacterium of the coastal bivalve *Solemya velum*: A blueprint for thriving in and out of symbiosis. BMC Genomics. *In press.*

Sarode N, Parris DJ, Ganesh S, Seston SL, **Stewart FJ**. 2014. Generation and analysis of microbial metatranscriptomes. Manual of Environmental Microbiology, Fourth Edition. *In press.*

Lee FJ, Rusch D, **Stewart FJ**, Mattila HR, Newton ILG. Saccharide breakdown and fermentation by the honey bee gut microbiome. Environmental Microbiology. *In press.* DOI: 10.1111/1462-2920.12526

Lin Y, Cradick TJ, Brown MT, Deshmukh H, Ranjan P, Sarode N, Wile BM, Vertino PM, **Stewart FJ**, Bao G. 2014. CRISPR/Cas9 systems have off-target activity with insertions or deletions between target DNA and guide RNA sequences. Nucleic Acids Research. 42: 7473–7485.

Stewart FJ, Ulloa O. 2014. Microbial metagenomics of oxygen minimum zones. Marco D (ed.) Metagenomics of the Microbial Nitrogen Cycle: Current innovations and future trends. Horizon Scientific Press.

Ganesh S, Parris DJ, DeLong EF, **Stewart FJ**. 2014. Metagenomic analysis of size-fractionated picoplankton in a marine oxygen minimum zone. ISME J. 8: 187-211.

Cavanaugh CM McKiness ZP, Newton ILG, **Stewart FJ**. 2013. Marine chemosynthetic symbioses" in E. Rosenberg et al., Eds., The Prokaryotes 1: 579-607. Springer-Verlag, New York, Online: http://link.springer.com/book/10.1007/978-3-642-30194-0

Stewart FJ. 2013. Commentary: Where the genes flow. Nature Geoscience. 6: 688-690.

Stewart FJ. 2013. Preparation of microbial community cDNA for metatranscriptomic analysis in marine plankton. Methods Enzymol. 531: 187-218.

Sanders JG, Beinart RA, **Stewart FJ**, DeLong EF, Girguis PR. 2013. Metatranscriptomics reveal differences in in situ energy and nitrogen metabolism among hydrothermal vent snail symbionts. ISME J. 7: 1556-1567.

Dimond JL, Kerwin AH, Rotjan R, Sharp K, **Stewart FJ**, Thornhill DJ. 2013. A simple temperature-based model predicts the upper latitudinal limit of the temperate coral *Astrangia poculata*. Coral Reefs. 32: 401-409.

Ulloa O, Canfield DE**,** DeLong EF, Letelier RM, **Stewart FJ**. 2012. Perspective: Microbial oceanography of anoxic oxygen minimum zones. PNAS. 109: 15996-16003.

Stewart FJ, Dalsgaard T, Thamdrup B, Revsbech NP, Ulloa O, Canfield DE, and DeLong EF. 2012. Experimental perturbation and oxygen addition elicit profound changes in community transcription in OMZ bacterioplankton. PLoS ONE. 7: e37118

Bryant JA, **Stewart FJ**, Eppley JM, and DeLong EF. 2012. Microbial community phylogenetic and trait diversity decline steeply with depth in a marine oxygen minimum zone. Ecology. 93:1659-1673.

Stewart FJ, Ulloa O, DeLong EF. 2012. Microbial metatranscriptomics in a permanent marine oxygen minimum zone. Environ. Microbiol. 14:23-40.

Stewart FJ. 2011. Dissimilatory sulfur cycling in oxygen minimum zones: an emerging metagenomics perspective. Biochem. Soc. Trans. 39: 1859-63.

Stewart FJ, Dmytrenko O, DeLong EF, Cavanaugh CM. 2011. Metatranscriptomic analysis of sulfur oxidation genes in the endosymbiont of *Solemya velum*. Front. Microbiol. 2:134. doi:10.3389/fmicb.2011.00134

Stewart FJ, Cavanaugh CM. Pyrosequencing analysis of endosymbiont diversity. 2011. In: de Bruijn FJ (ed.). Handbook of Molecular Microbial Ecology II: Metagenomics in Different Habitats. Wiley-Blackwell.

Stewart FJ, Sharma AK, Bryant JA, Eppley JM, DeLong EF. 2011. Community transcriptomics reveals universal patterns of protein sequence conservation in microbial communities. Genome Biol. 12:R26.

Canfield DE, **Stewart FJ**, Thamdrup B, De Brabandere L, Dalsgaard T, DeLong EF, Revsbech NP, Ulloa O. 2010. A cryptic sulfur cycle in oxygen-minimum zone waters off the Chilean Coast. Science. 330: 1375-1378.

Stewart FJ, Ottesen EA, DeLong EF. 2010. Development and quantitative analyses of a universal rRNA-subtraction protocol for microbial metatranscriptomics. ISME J. 4: 896-907.

Roeselers G, Newton ILG, Woyke T, Auchtung TA, Dilly GF, Dutton RJ, Fisher MC, Fontanez KM, Lau E, **Stewart FJ**, Richardson P, Barry K, Saunders E, Detter JC, Wu D, Eisen JA, Cavanaugh CM. Complete genome sequence of Candidatus Ruthia magnifica. Stan. Genomic. Sci. 3:163-173.

Stewart FJ, Baik AHY, Cavanaugh CM. 2009. Genetic subdivision of chemosynthetic endosymbionts of *Solemya velum* along the southern New England coast. Appl. Environ. Microbiol. 75:6005-6007.

Stewart FJ, Cavanaugh CM. 2009. Pyrosequencing analysis of endosymbiont population structure: co-occurrence of divergent symbiont lineages in a single vesicomyid host clam. Environ. Microbiol. 11:2136-2147.

Stewart FJ, Young CR, Cavanaugh CM. 2009. Evidence for homologous recombination in intracellular chemosynthetic clam symbionts. Mol. Biol. Evol. 26:1391-1404.

Fritsen CH, Memmott JC, **Stewart FJ**. 2008. Inter-annual sea ice dynamics and micro-algal biomass in winter pack ice: Marguerite Bay, Antarctica. Deep-Sea Res. Pt II. 55:2059-2067.

Stewart FJ, Young CR, Cavanaugh CM. 2008. Lateral symbiont acquisition in a maternally transmitted chemosynthetic clam endosymbiosis. Mol. Biol. Evol. 25:673-687.

Stewart FJ, Cavanaugh CM. 2007. Intragenomic variation and evolution of the internal transcribed spacer of the rRNA operon in Bacteria. J. Mol. Evol. 65:44-67.

Newton ILG, Woyke T, Auchtung TA, Dilly GF, Dutton RJ, Fisher MC, Fontanez KM, Lau E, **Stewart FJ**, Richardson PM, Barry KW, Detter JC, Wu D, Eisen JA, Cavanaugh CM. 2007. The *Calyptogena magnifica* chemoautotrophic symbiont genome. Science. 315:998-1000.

Stewart FJ, Cavanaugh CM. 2006. Bacterial endosymbioses in *Solemya* (Mollusca, Bivalvia): model systems for studies of symbiont-host adaptation. Anton. Leeuw. Int. J. G. 90:343-360.

Cavanaugh CM, McKiness ZP, Newton ILG, **Stewart FJ**. 2006. Marine chemosynthetic symbioses. In: Dworkin M, Falkow S, Rosenberg E, Schleifer KH, Stackebrandt E (eds.). *The Prokaryotes. Third Edition. A Handbook on the Biology of Bacteria:Symbiotic Associations, Biotechnology, Applied Microbiology*. Springer, New York.

Mix LJ, Armstrong JC, Mandell AM, Mosier AC, Raymond J, Raymond SN, **Stewart FJ**, von Braun K, Zhaxybayeva O (eds.). 2006. The Astrobiology Primer: An outline of general knowledge. Astrobiology. 6(5):735-813.

Stewart FJ, Cavanaugh CM. 2005. Symbiosis of thioautotrophic bacteria with *Riftia pachyptila*. In: Overmann, J. (ed.). *Molecular Basis of Symbiosis*. Springer-Verlag, Berlin. p.197-225.

Stewart FJ, Newton ILG, Cavanaugh CM. 2005. Chemosynthetic endosymbioses: adaptations to oxic-anoxic interfaces. Trends Microbiol. 13(9): 439-448.

Stewart FJ, Fritsen CH, Garrison DL. 2005. Bacteria-algae associations in the sea ice and upper water column of the Ross Sea in late austral summer. Antarct. J. US. 33: 38-41.

Stewart FJ, Fritsen CH. 2004. Bacteria-algae relationships in Antarctic sea ice. Antarct. Sci. 16(2): 143-156.

MANUSCRIPTS IN REVIEW / REVISION

Ganesh S, Bristow LA, Larsen M, Sarode N, Thamdrup B, **Stewart FJ**. Size-fraction partitioning of community gene transcription and rates of nitrogen metabolism in a marine oxygen minimum zone. *in review*

Glass JB, Kretz CB, Ganesh S, Ranjan P, Seston SL, Buck KN, Landing WM, Morton PL, Moffett JW, Giovannoni SJ, Vergin KL, Beszteri B, **Stewart FJ**. Marine metal availability predicts microbial community gene composition. *in review*

Moisander PH, Lazzara CS, Valery CM, Parris DJ, **Stewart FJ**, Montoya JP. Taxon-specific distributions of diazotrophs in the Mississippi River plume. *in review*

Ramirez-Flandes S, Bertagnolli AD, **Stewart FJ**, Ulloa O. Functional exploration of microbial environmental sequence data. Microbiology-Open. *in review*

MANUSCRIPTS IN PREPARATION

Bristow LA, Sarode N, Cartee J, Thamdrup B, **Stewart FJ**. Metagenomics and biogeochemical analysis of nitrite accumulation in the Gulf of Mexico hypoxic zone. In prep for L&O

Bristow LA, **Stewart FJ**, Ulloa O, DeLong EF, Altabet MA. Nitrogen isotopes and microbial community gene content and expression support a role for nitrite oxidation throughout the permanent oxygen minimum zone off northern Chile. In prep for ISME

Seston SL, Beinart RA, Sarode N, Shockey AC, Ranjan P, Ganesh S, Girguis PR, **Stewart FJ**. Comparative metatranscriptomic analysis of *Ifremeria nautilei* endosymbionts in multiple individuals under different electron donating conditions. In prep for ISME.

POSTERS, PRESENTATIONS, CONFERENCE PROCEEDINGS

Garcia-Robledo E, Revsbech NP, Tiano L, Paulmier A, Stewart F, Lehner P, Klimant I. 2015. Secondary chlorophyll maximum in oxygen minimum zones: Photosynthesis and aerobic respiration at nanomolar oxygen levels. ASLO Aquatic Sciences.

Kretz CB, Reese BK, Sarode ND, **Stewart FJ**, Glass JB. 2014. Microbial diversity and distribution in deep subsurface Hydrate Ridge sediments. C-DEBI Annual Meeting.

Padilla CC, Bristow LA, Benson CR, Sarode N, Girguis PR, Glass JB, DiChristina TJ, Thamdrup B, **Stewart FJ**. 2014. NC10 bacteria in a marine oxygen minimum zone. AGU Annual Meeting.

Glass JB, Reed BC, Bray M, Sarode N, Kretz CB, DiChristina TJ, **Stewart FJ**, Fowle DA, Crowe SA. 2014. Isolation and characterization of microbes mediating thermodynamically favorable coupling of anaerobic oxidation of methane and metal reduction. AGU Annual Meeting.

Glass JB, Kretz CB, Ganesh, S, Ranjan P, Seston SL, **Stewart FJ**. 2014. Abundance and taxonomy of microbial genes encoding iron and copper-binding proteins in oxygen minimum zones: Integrating marine metagenomics and geochemistry. GRC Marine Microbes.

Seston SL, Shockey AC, Beinart RA, Sarode N, Ganesh S, Girguis PR, Stewart FJ. 2014. Comparative metatranscriptomic analysis of Ifremeria nautilei endosymbionts in multiple individuals under different electron donating conditions. Poster. ASM Annual Meeting.

Bristow LA, Ganesh S, Larsen M, Parris DJ, **Stewart FJ**, Thamdrup B. 2014. Size fractionated process rates and omics of key nitrogen cycling processes in a marine oxygen minimum zone. ASLO Ocean Sciences.

Caro-Qunitero A, Sarode N, Parris DJ, Ganesh S, **Stewart FJ**. 2014. Metagenomics of microbial communities in the Louisiana Shelf hypoxic zone. ASLO Ocean Sciences.

Ganesh S, Bristow LA, Thamdrup B, **Stewart FJ**. 2014. Metatranscriptomics identifies metabolic partitioning among microbial size fractions in a marine oxygen minimum zone. ASLO Ocean Sciences.

Glass J, Buck K, Bristow L, Thamdrup B, **Stewart FJ**. 2014. Bioessential trace metal and nitrogen cycling in the Eastern Tropical North Pacific oxygen minimum zone. ASLO Ocean Sciences.

Parris DJ, Ganesh S, DeLong EF, Edgcomb V, **Stewart FJ**. 2014. Microbial eukaryote diversity in the marine oxygen minimum zone off northern Chile. ASLO Ocean Sciences.

Schwenck SM, Brum JR, **Stewart FJ**, Sullivan MB. 2014. When the oxygen minimum zone and euphotic zone collide, viral communities are altered. ASLO Ocean Sciences.

Beckler J, Rabouille C, **Stewart F**, Taillefert M. 2013. Formation of soluble organic-Fe(III) complexes in sedimentary environments. ACS National Meeting.

Bristow L, **Stewart FJ**, Parris DJ, Ganesh S, Thamdrup B. 2013. How do we explain nitrite accumulation in the hypoxic bottom waters of the Gulf of Mexico. ASLO Aquatic Sciences.

Stewart FJ. 2013. Chemosynthesis in the global ocean: emerging perspectives from marine oxygen minimum zones. (Invited). ASLO Aquatic Sciences.

Dalsgaard T, **Stewart FJ**, De Brabandere L, Thamdrup B, Revsbech NP, Canfield DE, Bristow L, Ulloa O, Young CR, DeLong EF. 2013. Effect of oxygen on process rates and gene expression of anammox and denitrifcation in the Eastern South Pacific oxygen minimum zone. ASLO Aquatic Sciences.

Ganesh, S. Parris DJ, DeLong EF, **Stewart FJ**. 2013. Metagenomic analysis of size-fractionated picoplankton in a marine oxygen minimum zone. 2012. ASLO Aquatic Sciences.

Moisander PH, Valery C, Parris DJ, **Stewart FJ**, Montoya JM, Subramaniam A. 2013. Diversity and distribution of diazotrophs on the Mississippi River Plume. ASLO Aquatic Sciences.

Sanders JG, Beinart RA, **Stewart FJ**, DeLong EF, Girguis PR. 2012. Differences in energy metabolism among symbionts of hydrothermal vent gastropods relates to geochemical niche. ASM Beneficial Microbes.

Stewart FJ, Dalsgaard T, Thamdrup B, Revsbech NP, Ulloa O, Canfield DE, and DeLong EF. Experimental

perturbation and oxygen addition elicit profound changes in community transcription in OMZ bacterioplankton. Presentation. 2012 Ocean Sciences.

Ganesh S, Parris DJ, DeLong EF, **Stewart FJ**. Metagenomic analysis of size-fractionated picoplankton in a marine oxygen minimum zone. 2012. Georgia Tech Research and Innovation Conference.

Biddle J, Guigo R, Peplies J, **Stewart F**. 2011. Training Marine Microbiologists Today: Culturing Versus Unix. In: US-EU Task Force on Biotechnology Research, EC-US Workshop on Marine Genomics.

Kerwin A, Rotjan R, Dimond J, Thornhill D, **Stewart F**, Distel D, Sharp K. 2011. Variation in bacterial assemblages associated with different symbiotic states of the facultatively symbiotic coral, *Astrangia poculata*. Boston Bacterial Meeting.

Mondav R, Tyson G, **Stewart F**, Schmidt S. 2010. Metatranscriptomic comparison of an agricultural and a forest soil. Poster. Soil Metagenomics 2010.

Bristow LA, Altabet MA, **Stewart FJ**, DeLong EF, Ulloa O. 2010. Enriched nitrate and depleted nitrite isotopic signatures in the OMZ off Northern Chile. Poster. 2010 AGU Fall Meeting.

Stewart FJ, Young CR, Cavanaugh CM. 2008. Pyrosequencing analysis of endosymbiont population structure: co-occurrence of divergent bacterial symbiont lineages in a single host clam. Poster. ASM Annual Meeting, and Boston Bacterial Meeting.

Newton ILG, **Stewart FJ**, Woyke T, Richardson PM, Barry KW, Detter JC, Bruce DC, Eisen JA, Cavanaugh CM. 2006. The *Calyptogena magnifica* symbiont draft genome: an obligate, maternally transmitted endosymbiont with extensive metabolic capabilities. Poster. ASM Annual Meeting.

Fritsen CH, **Stewart FJ**, Stammerjohn S, Smith R. 2004. Winter sea ice biota and environmental change along the Western Antarctic Peninsula. Poster. 2004 Ocean Sciences.

Stewart FJ, Fritsen CH, Murray AE, Carter BJ. 2003. Prokaryotes in Antarctic sea ice: richness and assemblage composition. Presentation. Life in Ice session. ASLO Aquatic Sciences.

Fritsen CH, Stewart FJ, Marschall SM, Memmot JC, Hartsough PC, Cunningham LM, Boc J, Blees MK, Adkins P. 2003. Interannual variation in winter sea ice biota: response to interannual variability in sea ice formation along the Western Antarctic Peninsula. Presentation. ASLO Aquatic Sciences.

Stewart FJ, Fritsen CH, Marschall SM, Memmott JM. 2002. Sea ice and water column microbial biomass and activity during the fall-winter transition west of the Antarctic Peninsula. Poster. 2002 Ocean Sciences.

Stewart FJ, Fritsen CH, Garrison DL, Gibson AH. 2001. Bacteria-algae associations in the sea ice and upper water column of the Ross Sea in the late austral summer. Poster. ASLO Aquatic Sciences.

PROPOSALS FUNDED

Characterization of microbes mediating anaerobic oxidation of methane coupled to iron reduction from an ancient ocean analogue. NASA-Exobiology, 2014-2017, Co-PI, $799,858

Microbial and viral regulation of community carbon cycling across diverse low-oxygen zones. DOE JGI Community Science Program, 2014-2017, PI

Microbial sulfur cycling in marine oxygen minimum zones. The Alfred P. Sloan Foundation, 09/15/2012 - 09/15/2014, $50,000, PI

CAREER: A phylogenetic and functional understanding of microbial sulfur cycling in oxygen minimum zones. NSF Biological Oceanography, 02/15/12 - 01/31/17, $1,210,901, PI

Getting the 411 on 454: Evaluating the efficacy of DNA pyrosequencing in microbial diversity studies. Harvard University Center for the Environment (HUCE) Seed Grant. co-written with PI Colleen Cavanaugh, 2008

Virulence and cell division genes in mutualistic bacterial endosymbionts: Insights into animal cell invasion and intracellular growth via comparative genomics. Merck. co-written with PI Colleen Cavanaugh, 2005

Nomination of the Proteobacterial symbiont of the hydrothermal vent clam *Calyptogena magnifica* for genome sequencing by the Department of Energy. DOE Microbial Genomes. co-written with PI Colleen Cavanaugh, 2004

PROPOSALS IN REVIEW

RUI: Collaborative Proposal: Effects of *Symbiodinium* density on mucus-associated microbial communities in a model multipartite coral symbiosis (*Astrangia poculata*), NSF IOS, PI

Collaborative Research: Symbiont gene expression and activity in response to environmental fluctuation in an experimentally tractable chemosynthetic symbiosis. NSF IOS, PI

Collaborative Research: Influence of nitrogen and trace metal availability on pathways of marine nitrous oxide production. NSF OCE, Co-PI

Biogeochemical impact of the Mekong River Plume on nutrient dynamics and plankton in the South China Sea. NSF Biological Oceanography, Co-PI

INVITED TALKS

LSU, Systematics, Ecology and Evolution Seminar Series, October 2014
Marine Microbes, Gordon Research Conference, Bentley University, June 2014
UBC, Microbiology and Immunology Seminar Series, March 2014
NSF Microbial Community 'Omics Cyberinfrastructure Meeting, Catalina Island, Aug. 2013
OMZ Symposium, Working group leader, Santa Cruz, Chile, March 2013
ASLO Aquatic Sciences Meeting, Tutorial lecture on Chemosynthesis, New Orleans, Feb. 2013
University of Florida, Microbiology and Cell Science Seminar Series, Feb. 2013
Symbiomics Field Workshop, HYDRA Institute of Marine Science, Elba, May 2012
Emory University, PBEE Seminar Series, March 2012
University of Georgia, Marine Science Seminar Series, March, 2012
New Mexico State University, HHMI Invited Speaker, Nov. 2011
University of Indiana, Microbiology Seminar Series, Sept. 2011
European N-Cycle meeting, Plenary address, Nijmegen, The Netherlands, July 2011
Georgia Tech, REU Aquatic Chemical Ecology summer program, June 2011
Georgia Tech, Integrative BioSystems Institute (IBSI) chalk talk, May 2011
J. Craig Venter Institute, San Diego, Symposium: “Paleobiology During the Genomics Era”, May 2011
University of Michigan, MACEPID Symposium – “Water, Microbes, and the Environment”, School of Public Health, April 2011
US-EC Workshop on Marine Genomics, Washington DC, Oct. 2010
Georgia Tech, School of Biology Seminar Series, Feb. 2010
Northwestern University, CEE Dept. Seminar Series, Feb. 2010

PROFESSIONAL ACTIVITIES AND ASSOCIATIONS

Coordinating committee, Ph.D. Program in Ocean Sciences & Technology, Georgia Tech, 2014-
Steering committee, Southeastern Biogeochemistry Symposium, 2013-
Undergraduate education committee, Georgia Tech, 2013-
Faculty search committee, Georgia Tech, 2013
Editorial Board, *Microbiome*
Review Editor, *Frontiers in Evolutionary and Genomic Microbiology*
Review Editor, *Frontiers in Microbial Symbioses*
Guest Editor, *PLoS Genetics*
Panel reviewer: NASA Astrobiology Program, 2012
Panel reviewer: Ridge 2000 Program, NSF, 2010
Member: American Society of Microbiology
Member: American Association for the Advancement of Science
Coordinator: Georgia Tech School of Biology Seminar Series

ADVISEES

Georgia Tech: Niko Alexandre (U, ACE REU), Catherine Benson (U, ACE REU), Alejandro Caro-Quintero (postdoc, April-Aug 2011), Jack Cartee (U), Natalie Chilcutt (U), Simon Chow (U), Nolan Fenzl (U), Sangita Ganesh (G), James Parker (U), Cory Padilla (G), Josh Parris (G), Piyush Ranjan (G), Neha Sarode (postdoc), Sherry Seston (Visiting Professor, Alverno College), Raghav Sharma (G), Abigail Shockey (U), Keerti Surapaneni (G), LaTrice Swain (high school science teacher, Arabia Mountain High School, GT GIFT Internship), Doug Terry (U), Arpita Yadav (U), Sarah York (U, ACE REU), Juliette Zerick (G); **MIT**: Jessica A. Bryant (tech); **Harvard**: Alan Baik (U), Oleg Dmytrenko (G), Jessica Thompson (U)