

**CURRICULUM VITAE**  
**John Francis Heidelberg**  
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**Professional Preparation.**

Maryville College, Maryville, TN. Biology. B.A. 1987

University of Maryland, College Park, MD. Marine-Estuarine-Environmental Sciences. Ph.D. 1997

**Professional Experience**

2019 – Present Professor, University of Southern California (USC)  
2019 – Present Interim Director, Wrigley Institute for Environmental Studies  
2016 – 2019 Associate Director, Wrigley Institute for Environmental Studies  
2015 – 2017 Section Head, Marine and Environmental Biology, University of Southern California  
2010 – 2019 Associate Professor with Tenure, University of Southern California (USC)  
2006 – 2010 Associate Professor, University of Southern California (USC)  
2006 – 2012 Adjunct Researcher, The J. Craig Venter Institute (JCVI)  
2006 – 2007 Adjunct Associate Investigator, The Institute for Genomic Research  
2004 – 2006 Associate Investigator, The Institute for Genomic Research (TIGR)  
1999 – 2004 Assistant Investigator, The Institute for Genomic Research (TIGR)  
1999-99 Collaborative Investigator, The Institute for Genomic Research (TIGR)  
1997-99 Post-Doctoral Fellow, The Institute for Genomic Research (TIGR)  
1996-96 Graduate Teaching Assistant, Department of Microbiology, UMD  
1992 –94 Faculty Research Assistant, Center for Agricultural Biotech., UMD  
1991-92 Graduate Teaching Assistant, Marine-Estuarine Environmental Sci, UMD  
1990- 91 Graduate Research Assistant, Department of Microbiology, UMD  
1987-89 Animal Program Coordinator, Brukner Nature Center, Troy Ohio

**Publications.**

1. **Heidelberg JF**, O'Neill KR, Jacobs D, Colwell RR. 1993. Enumeration of *Vibrio vulnificus* on membrane filters with a fluorescently labeled oligonucleotide probe specific for kingdom-level 16S rRNA sequences. *Appl Environ Microbiol.* 59:3474-6.
2. **Heidelberg JF**, Shahamat M, Levin M, Rahman I, Stelma G, Grim C, Colwell RR. 1997. Effect of aerosolization on culturability and viability of Gram-negative bacteria. *Appl Environ Microbiol.* 63:3585-8.

3. Nelson KE, Clayton RA, Gill SR, Gwinn ML, Dodson RJ, Haft DH, Hickey EK, Peterson JD, Nelson WC, Ketchum KA, McDonald L, Utterback TR, Malek JA, Linher KD, Garrett MM, Stewart AM, Cotton MD, Pratt MS, Phillips CA, Richardson D, **Heidelberg J**, Sutton GG, Fleischmann RD, Eisen JA, White O, Salzberg SL, Smith HO, Venter JC, Fraser CM. 1999. Evidence for lateral gene transfer between Archaea and bacteria from genome sequence of *Thermotoga maritima*. *Nature*. 399:323-9.
4. White O, Eisen JA, **Heidelberg JF**, Hickey EK, Peterson JD, Dodson RJ, Haft DH, Gwinn ML, Nelson WC, Richardson DL, Moffat KS, Qin H, Jiang L, Pamphile W, Crosby M, Shen M, Vamathevan JJ, Lam P, McDonald L, Utterback T, Zalewski C, Makarova KS, Aravind L, Daly MJ, Minton KW, Fleischmann RD, Ketchum KA, Nelson KE, Salzberg S, Smith HO, Venter JC, Fraser CM. 1999. Genome sequence of the radioresistant bacterium *Deinococcus radiodurans* R1. *Science*. 286:1571-7.
5. Read TD, Brunham RC, Shen C, Gill SR, **Heidelberg JF**, White O, Hickey EK, Peterson J, Utterback T, Berry K, Bass S, Linher K, Weidman J, Khouri H, Craven B, Bowman C, Dodson R, Gwinn M, Nelson W, DeBoy R, Kolonay J, McClarty G, Salzberg SL, Eisen J, Fraser CM. 2000. Genome sequences of *Chlamydia trachomatis* MoPn and *Chlamydia pneumoniae* AR39. *Nucleic Acids Res*. 28:1397-406.
6. Tettelin H, Saunders NJ, **Heidelberg J**, Jeffries AC, Nelson KE, Eisen JA, Ketchum KA, Hood DW, Peden JF, Dodson RJ, Nelson WC, Gwinn ML, DeBoy R, Peterson JD, Hickey EK, Haft DH, Salzberg SL, White O, Fleischmann RD, Dougherty BA, Mason T, Ciecko A, Parksey DS, Blair E, Cittone H, Clark EB, Cotton MD, Utterback TR, Khouri H, Qin H, Vamathevan J, Gill J, Scarlato V, Massignani V, Pizza M, Grandi G, Sun L, Smith HO, Fraser CM, Moxon ER, Rappuoli R, Venter JC. 2000. Complete genome sequence of *Neisseria meningitidis* serogroup B strain MC58. *Science* 287:1809-15.
7. **Heidelberg JF**, Eisen JA, Nelson WC, Clayton RA, Gwinn ML, Dodson RJ, Haft DH, Hickey EK, Peterson JD, Umayam L, Gill SR, Nelson KE, Read TD, Tettelin H, Richardson D, Ermolaeva MD, Vamathevan J, Bass S, Qin H, Dragoi I, Sellers P, McDonald L, Utterback T, Fleischmann RD, Nierman WC, White O, Salzberg SL, Smith HO, Colwell RR, Mekalanos JJ, Venter JC, Fraser CM. 2000. DNA sequence of both chromosomes of the cholera pathogen *Vibrio cholerae*. *Nature*. 2000 406:477-83.
8. Nelson KE, Paulsen IT, **Heidelberg JF**, Fraser CM. 2000. Status of genome projects for nonpathogenic bacteria and archaea. *Nat Biotechnol* 18:1049-54.
9. Eisen JA, **Heidelberg JF**, White O, Salzberg SL. 2000. Evidence for symmetric chromosomal inversions around the replication origin in bacteria. *Genome Biol*. 1:RESEARCH0011.

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12. Dziejman M, Balon E, Boyd D, Fraser CM, **Heidelberg JF**, Mekalanos JJ. 2002. Comparative genomic analysis of *Vibrio cholerae*: genes that correlate with cholera endemic and pandemic disease. Proc Natl Acad Sci U S A. 99:1556-61.
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15. Eisen JA, Nelson KE, Paulsen IT, **Heidelberg JF**, Wu M, Dodson RJ, Deboy R, Gwinn ML, Nelson WC, Haft DH, Hickey EK, Peterson JD, Durkin AS, Kolonay JL, Yang F, Holt I, Umayam LA, Mason T, Brenner M, Shea TP, Parksey D, Nierman WC, Feldblyum TV, Hansen CL, Craven MB, Radune D, Vamathevan J, Khouri H, White O, Gruber TM, Ketchum KA, Venter JC, Tettelin H, Bryant DA, Fraser CM. 2002. The complete genome sequence of *Chlorobium tepidum* TLS, a photosynthetic, anaerobic, green-sulfur bacterium. Proc Natl Acad Sci U S A. 99:9509-14.
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17. **Heidelberg JF**, Paulsen IT, Nelson KE, Gaidos EJ, Nelson WC, Read TD, Eisen JA, \*Seshadri R, Ward N, Methe B, Clayton RA, Meyer T, Tsapin A, Scott J, Beanan M, Brinkac L, Daugherty S, DeBoy RT, Dodson RJ, Durkin AS, Haft DH, Kolonay JF, Madupu R, Peterson JD, Umayam LA, White O, Wolf AM, Vamathevan J, Weidman J, Impraim M, Lee K, Berry K, Lee C, Mueller J, Khouri H, Gill J, Utterback TR, McDonald LA, Feldblyum TV, Smith HO, Venter JC, Neelson KH, Fraser CM. 2002. Genome sequence of the dissimilatory metal ion-reducing bacterium *Shewanella oneidensis*. Nat Biotechnol. 20:1118-23.
18. **Heidelberg JF**, Heidelberg KB, Colwell RR. 2002. Seasonality of Chesapeake Bay bacterioplankton species. Appl Environ Microbiol. 68:5488-97.
19. **Heidelberg JF**, Heidelberg KB, Colwell RR. 2002. Bacteria of the gamma-subclass Proteobacteria associated with zooplankton in Chesapeake Bay. Appl Environ Microbiol. 68:5498-507.
20. Paulsen IT, Banerjee L, Myers GS, Nelson KE, \*Seshadri R, Read TD, Fouts DE, Eisen JA, Gill SR, **Heidelberg JF**, Tettelin H, Dodson RJ, Umayam L, Brinkac L, Beanan M, Daugherty S, DeBoy RT, Durkin S, Kolonay J, Madupu R, Nelson W, Vamathevan J, Tran B, Upton J, Hansen T, Shetty J, Khouri H, Utterback T, Radune D, Ketchum KA, Dougherty BA, Fraser CM. 2003. Role of mobile DNA in the evolution of vancomycin-resistant *Enterococcus faecalis*. Science. 299:2071-4.
21. Read TD, Myers GS, Brunham RC, Nelson WC, Paulsen IT, **Heidelberg J**, Holtzapple E, Khouri H, Federova NB, Carty HA, Umayam LA, Haft DH, Peterson J, Beanan MJ, White O, Salzberg SL, Hsia RC, McClarty G, Rank RG, Bavoil PM, Fraser CM. 2003. Genome sequence of *Chlamydophila caviae* (*Chlamydia psittaci* GPIC): examining the role of niche-specific genes in the evolution of the Chlamydiaceae. Nucleic Acids Res. 31:2134-47.
22. \*Seshadri R, Paulsen IT, Eisen JA, Read TD, Nelson KE, Nelson WC, Ward NL, Tettelin H, Davidsen TM, Beanan MJ, Deboy RT, Daugherty SC, Brinkac LM, Madupu R, Dodson RJ, Khouri HM, Lee KH, Carty HA, Scanlan D, Heinzen RA, Thompson HA, Samuel JE, Fraser CM, **Heidelberg JF**. 2003. Complete genome sequence of the Q-fever pathogen *Coxiella burnetii*. Proc Natl Acad Sci U S A. 100:5455-60.
23. Haveman SA, Brunelle V, Voordouw JK, Voordouw G, **Heidelberg JF**, Rabus R. 2003. Gene expression analysis of energy metabolism mutants of *Desulfovibrio vulgaris* Hildenborough indicates an important role for alcohol dehydrogenase. J Bacteriol. 185:4345-53.
24. Miller ES, **Heidelberg JF**, Eisen JA, Nelson WC, Durkin AS, Ciecko A, Feldblyum TV, White O, Paulsen IT, Nierman WC, Lee J, Szczypinski B, Fraser CM. 2003. Complete genome sequence of the broad-host-range vibriophage KVP40: comparative genomics of a T4-related bacteriophage. J Bacteriol. 185:5220-33.
25. de la Torre JR, Christianson LM, Béjà O, Suzuki MT, Karl DM, **Heidelberg J**, DeLong EF. 2003. Proteorhodopsin genes are distributed among divergent marine bacterial taxa. Proc Natl Acad Sci U S A. 100:12830-5.

26. Leahy JG, Khalid ZM, Quintero EJ, Jones-Meehan JM, **Heidelberg JF**, Batchelor PJ, Colwell RR. 2003. The concentrations of hexadecane and inorganic nutrients modulate the production of extracellular membrane-bound vesicles, soluble protein, and bioemulsifier by *Acinetobacter venetianus* RAG-1 and *Acinetobacter* sp. strain HO1-N. *Can J Microbiol.* 49:569-75.
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28. \*Seshadri R, Myers GS, Tettelin H, Eisen JA, **Heidelberg JF**, Dodson RJ, Davidsen TM, DeBoy RT, Fouts DE, Haft DH, Selengut J, Ren Q, Brinkac LM, Madupu R, Kolonay J, Durkin SA, Daugherty SC, Shetty J, Shvartsbeyn A, Gebregeorgis E, Geer K, Tsegaye G, Malek J, Ayodeji B, Shatsman S, McLeod MP, Smajs D, Howell JK, Pal S, Amin A, Vashisth P, McNeill TZ, Xiang Q, Sodergren E, Baca E, Weinstock GM, Norris SJ, Fraser CM, Paulsen IT. 2004. Comparison of the genome of the oral pathogen *Treponema denticola* with other spirochete genomes. *Proc Natl Acad Sci U S A.* 101:5646-51.
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32. Moran MA, Buchan A, González JM, **Heidelberg JF**, Whitman WB, Kiene RP, Henriksen JR, King GM, Belas R, Fuqua C, Brinkac L, Lewis M, Johri S, Weaver B, Pai G, Eisen JA, Rahe E, Sheldon WM, Ye W, Miller TR, Carlton J, Rasko DA, Paulsen IT, Ren Q, Daugherty SC, Deboy RT, Dodson RJ, Durkin AS, Madupu R, Nelson WC, Sullivan SA, Rosovitz MJ, Haft DH, Selengut J, Ward N. 2004. Genome sequence of *Silicibacter pomeroyi* reveals adaptations to the marine environment. *Nature*. 432:910-3.
33. \*Seshadri R, Adrian L, Fouts DE, Eisen JA, Phillippy AM, Methe BA, Ward NL, Nelson WC, Deboy RT, Khouri HM, Kolonay JF, Dodson RJ, Daugherty SC, Brinkac LM, Sullivan SA, Madupu R, Nelson KE, Kang KH, Impraim M, Tran K, Robinson JM, Forberger HA, Fraser CM, Zinder SH, **Heidelberg JF**. 2005. Genome sequence of the PCE-dechlorinating bacterium *Dehalococcoides ethenogenes*. *Science*. 307:105-8.
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35. \*Seshadri R, **Heidelberg J**. 2005. Bacteria to the rescue. *Nat Biotechnol*. 23:1236-7.
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51. Nelson WC, Wollerman L, Bhaya D, **Heidelberg JF**. 2011 Analysis of insertion sequences in thermophilic cyanobacteria: exploring the mechanisms of establishing, maintaining, and withstanding high insertion sequence abundance. *Appl Environ Microbiol.* 77:5458-66.
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54. Tully\* BJ, Nelson WC, **Heidelberg JF**. 2012. Metagenomic analysis of a complex marine planktonic thaumarchaeal community from the Gulf of Maine. *Environ Microbiol.* 14:254-67.
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56. Tully\* BJ, **Heidelberg JF**. 2013. Microbial communities associated with ferromanganese nodules and the surrounding sediments. *Front Microbiol.* 4:161.
57. Singer E, **Heidelberg JF**, Dhillon A, Edwards KJ. 2013. Metagenomic insights into the dominant Fe(II) oxidizing Zetaproteobacteria from an iron mat at Lōʻihi, Hawaiʻi. 2013. *Front Microbiol.* 4:52
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- 63: Walworth, N., U. Pfreundt, W.C. Nelson, T. Mincer, **J.F. Heidelberg**, F. Fu, J.B. Waterbury, T. Glavina del Rio, L. Goodwin, N.C. Kyrpides, M.L. Land, T. Woyke, D.A. Hutchins, W.R. Hess, and E.A. Webb. 2015. *Trichodesmium* genome maintains abundant, widespread noncoding DNA in situ, despite oligotrophic lifestyle. *Proc Natl Acad Sci USA.* 112: 4251-4256
- 64: Tully\*, B.J. and **J.F. Heidelberg**. 2016. Potential mechanisms for microbial energy acquisition in oxic deep-sea sediments. *Appl Environ Microbiol.* 82:4232-4243



- 65: Graham\* ED, **J.F. Heidelberg**, B.J. Tully\*. 2017. BinSanity: unsupervised clustering of environmental microbial assemblies using coverage and affinity propagation. PeerJ. 5:e3035 <https://doi.org/10.7717/peerj.3035>
- 66: Tully\*, B.J., R. Sachdeva\*, E.D. Graham\*, **J.F. Heidelberg**. 2017. 290 Metagenome-assembled genomes from the Mediterranean Sea: a resource for marine microbiology. PeerJ 5:e3558 <https://doi.org/10.7717/peerj.3558>
- 67: Tully\*, B.J., E.D. Graham\*, **J.F. Heidelberg**. 2018. The reconstruction of 2,631 draft metagenome-assembled genomes from the global oceans Scientific Data 5, (170203)
- 68: Graham\*, E.D., **J.F. Heidelberg**, B.J. Tully\*. 2018. Potential for primary productivity in a globally-distributed bacterial phototroph. ISME J. (<https://doi.org/10.1038/s41396-018-0091-3>).

Submitted to Nature Microbiology: "Rare microbes ubiquitously dominate whole community activity". Sachdeva\*, R., Campbell B.J., **Heidelberg J.F.** Preprint available at <https://www.biorxiv.org/content/10.1101/636373v1>

*Senior Author on each paper is indicated by an underline  
Students and Post-doc authors are indicated with an asterisk (\*)*

***Selected Student presentations:***

Sachdeva\* R. and **Heidelberg J.F.** Multi-year patterns of high-resolution specific activities of sympatric microbial populations in an oxygen minimum zone. 16th International Symposium on Microbial Ecology. Montreal, Canada. August 2016.

BJ Tully\*, **JF Heidelberg**, B Kraft, PR Girguis, JA Huber . Metagenomic Assessment of a Dynamic Microbial Population from Subseafloor Aquifer Fluids in the Cold, Oxygenated Crust. American Geophysical Union, Ocean Sciences Meeting 2016

BJ Tully\*, JA Huber, **JF Heidelberg**. Metabolic Potential of Microbial Genomes Reconstructed from a Deep-Sea Oligotrophic Sediment Metagenome. American Geophysical Union, Ocean Sciences Meeting. 2016.

Sachdeva\*, R., **Heidelberg J.F.**, Campbell B.J. Are abundant bacteria more active than rare bacteria in the Sargasso Sea? A holistic metagenomic and metatranscriptomic approach. 15th International Symposium on Microbial Ecology (ISME-15). Seoul, South Korea. August 2014.

Sachdeva\*, R. and **Heidelberg J.F.** PhyLigo: An Integrated Approach for Binning Metagenomic Sequences and Its Practical Application to the Cosmopolitan Marine Actinobacterial Clade. Association for the Sciences of Limnology and Oceanography Ocean Sciences Meeting. Honolulu, HI. February 2014.

Sachdeva\*, R. and **Heidelberg J.F.** Metagenomic Classification and Characterization of Marine Actinobacteria from the Gulf of Maine without Representative Genomes. American Geophysical Union Fall Meeting. San Francisco, CA. December 2012.

Sachdeva\*, R. and **Heidelberg J.F.** Metagenomic binning and characterization of Marine Euryarchaea from the Gulf of Maine without a Representative Genome. American Society for Microbiology General Meeting. San Francisco, CA. May 2012.

Sachdeva\*, R **Heidelberg J.F.** Binning Metagenomic Assemblies without a Representative Genome. Classifying Euryarchaeotal Metagenomic Assemblies without a Representative Genome. Center for Environmental Genomics - Metagenomics Workshop. Lewes, DE. December 2011.

### **Select Invited Talks**

Data Management and Integration for C-DEBI Phase II. C-DEBI Annual Meeting. Marina California. October 2015

ECO-GEO Essential Variables Session. EarthCube All Hands Meeting. Washington DC. May 2015

Environmental Genomics for Microbial Ecology. Virginia Tech University. 2014

Exploring the Genomic Potential of Marine Microorganisms. EU-US Bioinformatics Workshop. University of Delaware/ DBI. June 2013

Environmental Genomics for Microbial Ecology. University of Alabama, Huntsville. October 2012.

Environmental Genomics for Microbial Ecology. Korea Microbial Ecology Workshop. February 16 - 18, 2011

Germ Warfare in a Microbial Mat Community. Annual Meeting on Microbial Ecology. Harbin Institute of Technology. Harbin, China. August 2010

Germ Warfare in a Microbial Mat Community. 2nd CRISPR Research Conference. Berkeley, CA, July 23-25 2009

Environmental Genomics for Microbial Ecology. Systems Biology 2009 - Solutions for a Changing World. May 2009

Environmental Genome Shotgun Sequencing: Microbial Populations off the Coast of Nova Scotia, Canada. The 12th International Symposium on Microbial Ecology August 2008

Genomic, Metagenomic and Functional Analyses of Cyanobacteria from Hot-Spring Microbial Mats. “Genomes to Systems Meeting” Manchester England. March 2008

The Future of Marine Science Infrastructure - A World Beyond Ships. Genomics, Metagenomics, Transcriptomics, and Marine Labs. National Association of Marine Laboratories Biennial Meeting October 2007

Exploring the Genomic Potential of Marine Microorganisms. ICoMM Meeting. Deakin University, Geelong, Australia. July 2006.

Comparative Genomics of *Vibrio cholerae*. The Biology of Vibrios: Biodiversity, Genomics, Disease/Epidemiology, and Applications. November 2005

Microbial Genomics. “Exploring the Genomic Potential of Uncultured Microorganisms”. Society for Industrial Microbiology. August 23, 2005

Microbial Genomics “Exploring Microbes From the Inside”. GLACEO Meeting. October 2004

Exploring the Genomic Potential of Marine Microorganisms. Korea Research Institute of Bioscience & Biotechnology. August 2004

Microbial Genomics. “Exploring the Genomic Potential of Uncultured Microorganisms”. John S. Boyer Symposium. June 7, 2004

Exploring the Genomic Potential of Marine Microorganisms. Carnegie Institution for Science - Department of Plant Biology. May 2004

Exploring the Genomic Potential of Marine Microorganisms. SCOPE Meeting on Microbial Environmental Genomics Lake Arrowhead, CA. April 2004

How (or better yet, WHY) Do We Study Environmental Microorganisms. Portland State University. June 2003.

Exploring Genomic Potential and Microbial Diversity of Marine Bacterioplankton Populations. Aquatic Sciences Meeting. Salt Lake City, UT. February 2003

Genome Sequencing and Assembly: “The Closure Phase”. Advances in Genome Technology and Bioinformatics. Marine Biological Laboratory. October 2002

Exploring Genomic Potential and Microbial Diversity of Uncultured Microorganisms. Its More interesting than you think, It has to be!! Hood College, April 2001

## **Current and Recent Service**

2018 – Present: President of the Southern California Marine Institute. The Southern California Marine Institute (SCMI) consortium represents a strategic alliance of 23 major universities, colleges, and foundations in Southern California. It’s mission is to foster marine research and education, focusing on urban impacts of the greater Los Angeles region on the coastal ocean. We seek to improve scientific understanding and the development of solutions that will enable coastal waters and watersheds to thrive, adapt and become resilient to ongoing environmental stressors.

2016 – Present: Associate Executive Director, Wrigley Institute for Environmental Studies (WIES). In this role I serve as the “inward” looking leader for the WIES. I direct the Wrigley Marine Science Center, develop programs that primarily involve USC Faculty, fundraise for new faculty research programs, etc.

2015 – 2017: Section Head, Marine and Environmental Biology, University of Southern California. The Biology Department in the Dornsife collage is divided in “section”. The Section Head is responsible for managing the faculty and graduate programs. The role is basically that of a Department Chair without administering and undergraduate program.

#### **Graduate Students Mentorship.**

- 1) Benjamin Tully - 2007-2013; Dissertation: Using sequencing techniques to explore microbial communities associated with ferromanganese nodules and sediment from the South Pacific Gyre. Currently Dr. Tully is C-DEBI’s Bioinformatics Specialist
- 2) Rohan Sachdeva – 2009 – 2015; Dissertation: Rare microbes from diverse Earth biomes dominate community activity. Currently Dr. Sachdeva is a staff scientist in Dr. Banfield’s lab at UC Berkeley.
- 3) Elaina Graham – 2014 – Present; Dissertation project: Potential for primary productivity in a globally-distributed bacterial phototroph.
- 4) Emily Aguirre (co-advised with Dr Carly Kenkel). 2018 – Present. Dissertation project: Bacterial biomarkers of the endangered coral, *Acropora cervicornis*

#### **Teaching:**

**BISC120: General Biology: Organismal Biology and Evolution:** In-depth survey of key topics related to advances in our knowledge of the diversity of life and evolution; origin of life; eukaryotes/prokaryotes; ecology.

Fall 2008: 218 students. Instructor Rating: 3.41	Course Rating: 3.45
Fall 2009: 231 students. Instructor Rating: 3.82	Course Rating: 3.58
Fall 2010: 254 students: Instructor Rating: 4.29	Course Rating: 3.63
Fall 2011: 298 students: Instructor Rating: 4.25	Course Rating: 3.63
Fall 2012: 305 students: Instructor Rating: 4.63	Course Rating: 3.59
Fall 2013: 255 students: Instructor Rating: 4.54	Course Rating: 3.60

**BISC300: Introduction to Microbiology:** Comparative approach to bacteria, Archaea and viruses; their structure, life cycles, geochemical activity, ecology and nutrition. Fundamentals of metabolism and microbial genetics.

Spring 2013: 82 students. Instructor Rating: 4.30	Course Rating: 3.88
Spring 2014: 85 students. Instructor Rating: 4.45	Course Rating: 3.75
Spring 2015: 75 students. Instructor Rating: 4.20	Course Rating: 3.42
Spring 2016: 58 students. Instructor Rating: 4.40	Course Rating: 3.72

**BISC431: Aquatic Microbiology -- Catalina and Maymester Semester:** Introduction to the habitat, phylogenetic, physiological and metabolic diversity of microbial life in aquatic environments.

Spring 2011: 9 students. Instructor Rating: 4.88	Course Rating: 4.63
Spring 2012: 15 students. Instructor Rating: 5.0	Course Rating: 4.7
Spring 2013: 15 students. Instructor Rating: 5.0	Course Rating: 5.0
Spring 2014: 16 students. Instructor Rating: 5.0	Course Rating: 4.75
Spring 2015: 15 students. Instructor Rating: 5.0	Course Rating: 4.7
Spring 2016: 9 students. Instructor Rating: 4.33	Course Rating: 4.67
Spring 2016: 13 students. Instructor Rating: 5	Course Rating: 4.67
Spring 2018: 9 students. Instructor Practices: 4	Course Impact: 4 (both out of 4)

**BISC455: Molecular Approaches to Microbial Diversity.** Overview and practical application of genetic and immunological techniques for examining diversity and community structure of natural microbial assemblages in aquatic ecosystems.

Fall 2007: 7 students. Instructor Rating: 3.86	Course Rating: 3.00
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**BISC499: Environmental Microbiology – Catalina Semester.** Qualitative and quantitative appraisal of microbial activities in pure and contaminated environments; microbial community and its development; interspecific relationships; effects of microorganisms on their surroundings

Fall 2006: 4 students. Instructor Rating: 4.50	Course Rating: 4.75
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**BISC584: Faculty Lecture Series:** Multi-instructor course designed to introduce students to the breadth and depth of faculty interests within the MEB Section of Biological Sciences and the Natural History Museum.

Spring 2009: 9 students (not evaluated)  
Spring 2010: 14 students (not evaluated)  
Spring 2011: 19 students (not evaluated)

**BISC583: Evolution and Adaptation of Marine Organisms.** Fundamentals of evolutionary patterns and processes in the marine environment, with emphasis on rates of adaptation to a changing ocean

Spring 2010: 11 students. Instructor Rating: 4.20	Course Rating: 4.40
Spring 2012: 11 students. Instructor Rating: 5.0	Course Rating: 4.71
Spring 2014: 10 students. Instructor Rating: 4.83	Course Rating: 4.33
Spring 2016: 4 students. Instructor Rating: 4.33	Course Rating: 4.67
Spring 2017: 3 students. Instructor Rating: 5.0	Course Rating: 5.0
Spring 2018: 8 students. Instructor Practices: 3.56	Course Impact: 3.56 ( <b>both out of 4</b> )

**BISC599: Special Topics – Microbial Genomics:** Introduction to the tool and methods of microbial genomics.