

DAVID B. MARK WELCH

Director, Josephine Bay Paul Center for
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Education

B.A. 1989 Biology, *summa cum laude*, Earlham College, Richmond IN
Ph.D. 1999 Biochemistry, Harvard University, Cambridge MA. Thesis: "*Evidence for the evolution of bdelloid rotifers without sexual reproduction or genetic exchange.*"

Academic appointments

2001–2003 Research Associate, Josephine Bay Paul Center for Comparative Molecular Biology and Evolution, Marine Biological Laboratory
2003–2006 Assistant Research Scientist, Josephine Bay Paul Center
2005–2010 Assistant Professor (MBL), Department of Ecology and Evolutionary Biology, Brown University
2006–2010 Assistant Scientist, Josephine Bay Paul Center
2010–2013 Assistant Professor (MBL), Department of Molecular Biology, Cell Biology, and Biochemistry (MCB), Brown University
2010–2015 Associate Scientist, Josephine Bay Paul Center
2013–present Associate Professor (MBL), MCB, Brown University
2015–present Senior Scientist, Josephine Bay Paul Center

Professional appointments

2013–present Director, Josephine Bay Paul Center
2014–present Associate, Center for Computational Molecular Biology, Brown University
2016–present Associate Director, The Microbiome Center, University of Chicago-MBL-Argonne National Laboratory
2017–present Interim Director of the Division of Research, Marine Biological Laboratory

Academic honors

1989 College Honors, Departmental Honors (Biology), Earlham College
1989–1992 National Science Foundation Graduate Research Fellowship Grant
1993, 2001 Derek Bok Certificate of Distinction in Teaching, Harvard University
2005 Neal Cornell Research Fellow, Marine Biological Laboratory
2007 Neal Cornell Career Development Award, Marine Biological Laboratory

Publications

refereed journal articles

Welch, D., C-H. Lee and S.H. Larsen, 1990. Detection of plasmid DNA from all *Chlamydia trachomatis* serovars with a two-step polymerase chain reaction. *Appl. Environ. Microbiol.* 56: 2494–2498.
Mark Welch, D.B., and M. Meselson, 1998. Measurements of the genome size of the monogonont rotifer *Brachionus plicatilis* and of the bdelloid rotifers *Philodina roseola* and *Habrotrocha constricta*. *Hydrobiologia* 387/388: 395–402.
Mark Welch, D.B., 2000. Evidence from a protein-coding gene that acanthocephalans are rotifers. *Invert. Biol.* 119: 17–26.

- Mark Welch, D.B., and M. Meselson, 2000. Evidence for the evolution of bdelloid rotifers without sexual reproduction or genetic exchange. *Science* 288: 1211–121.
- Mark Welch, D.B., 2001. Early contributions of molecular phylogenetics to understanding the evolution of Rotifera. *Hydrobiologia* 446/447: 315–322.
- Mark Welch, D.B., and M. Meselson, 2001. A survey of introns in three genes of rotifers. *Hydrobiologia* 446/447: 333–336.
- Mark Welch, D.B., and M. Meselson, 2001. Rates of nucleotide substitution in sexual and asexually reproducing rotifers. *Proc. Natl. Acad. Sci.* 98: 6720–6724.
- Mark Welch, D.B., and M. Meselson, 2003. Oocyte nuclear DNA content and GC proportion in rotifers of the asexually reproducing Class Bdelloidea. *Biol. J. Linn. Soc.* 79: 85–91.
- Mark Welch, D.B., M.P. Cummings, D. M. Hillis, and M. Meselson, 2004. Divergent gene copies in the asexual class Bdelloidea (Rotifera) separated before the bdelloid radiation or within bdelloid families. *Proc. Natl. Acad. Sci.* 101: 1622–1625.
- Mark Welch, J.L., D.B. Mark Welch, and M. Meselson, 2004. Cytogenetic evidence for asexual evolution of bdelloid rotifers. *Proc. Natl. Acad. Sci.* 101: 1618–1621.
- Mark Welch, D.B., 2005. Bayesian and maximum likelihood analysis of rotifer-acanthocephalan relationships. *Hydrobiologia* 546: 47–54.
- Mark Welch, D.B., and J.L. Mark Welch. 2005. The potential of genomic approaches to rotifer ecology. *Hydrobiologia* 546: 101–108.
- Sogin, M.L., H.G. Morrison, J.A. Huber, D.B. Mark Welch, S.M. Huse, P.R. Neal, J.M. Arrieta, and G.J. Herndl. 2006. Microbial diversity in the deep sea and the underexplored "rare biosphere." *Proc. Natl Acad. Sci.* 103: 12115–12120.
- Ekanayake, D.K., D.B. Mark Welch, R. Kieft, S. Hajduk and W.P.J. Dittus. 2007. Transmission dynamics of *Cryptosporidium* infection in a natural population of non-human primates at Polonnaruwa, Sri Lanka. *Am. J. Trop. Med. Hyg.* 77: 818–822.
- Suga, K., D.B. Mark Welch, Y. Tanaka, Y. Sakakura, and A. Hagiwara. 2007. Analysis of expressed sequence tags of the cyclically parthenogenetic rotifer *Brachionus plicatilis*. *PLoS ONE* 2: e671.
- Huse, S.M., J.A. Huber, H.G. Morrison, M.L. Sogin, and D.B. Mark Welch. 2007. Accuracy and quality of massively parallel pyrosequencing. *Genome Biology* 8: R143.
- Huber, J.A., D.B. Mark Welch, H.G. Morrison, S.M. Huse, P.R. Neal, D.A. Butterfield, and M.L. Sogin. 2007. Microbial population structures in the deep marine biosphere. *Science* 318: 97–100.
- Mark Welch, D.B., J.L. Mark Welch, and M. Meselson. 2008. Evidence for degenerate tetraploidy in bdelloid rotifers. *Proc. Natl. Acad. Sci (USA)* 105: 5145–5149.
- Suga, K., D.B. Mark Welch, Y. Tanaka, Y. Sakakura, and A. Hagiwara. 2008. Two circular chromosomes of unequal copy number make up the mitochondrial genome of the rotifer *Brachionus plicatilis*. *Mol. Biol. Evol.* 25: 1129–1137.
- Lasek-Nesselquist, E., R. Gast, M. Moore, D.B. Mark Welch, J. Elis, and M.L. Sogin. 2008. Molecular characterization of *Giardia intestinalis* in marine animals: variation and zoonotic potential. *Dis. Aquat. Organ.* 81: 39–51.
- Huse, S.M., L. Dethlefsen, J.A. Huber, D.B. Mark Welch, D.A. Relman, and M.L. Sogin. 2008. Exploring microbial diversity and taxonomy using SSU rRNA hypervariable tag sequencing. *PLoS Genetics* 4: e1000255.
- Huber, J.A., H.G. Morrison, S.M. Huse, P.R. Neal, M.L. Sogin, and D.B. Mark Welch. 2009. Effect of PCR amplicon size on assessments of clone library microbial diversity and community structure. *Molecular Ecology* 11:1292–1302.
- Snell, T.W., Shearer T.L., Smith H.A., Kubanek J., Gribble, K.E., and D.B. Mark Welch.

2009. Genetic determinants of mate recognition in *Brachionus manjavacas* (Rotifera). *BMC Biology* 7: 60.
- Witek, A., H. Herlyn, I. Ebersberger, D.B. Mark Welch, and T. Hankeln. 2009. Support for the monophyletic origin of Gnathifera from phylogenomics. *Mol. Phylogenet Evol* 53: 1037–1041.
- Lasek-Nesselquist, E., D.B. Mark Welch, R.C.A. Thompson, R.F. Steuart and M.L. Sogin. 2009. Genetic exchange within and between assemblages of *Giardia duodenalis*. *J Euk Microbiol.* 56: 504–518.
- Olins, A. L., G. Rhodes, D. B. Mark Welch, M. Zwerger and D. E. Olins. 2010. Lamin B receptor: Multi-tasking at the nuclear envelope. *Nucleus* 1: 53–70.
- Huse, S.M., D.B. Mark Welch, H.G. Morrison, and M.L. Sogin. 2010. Ironing out the wrinkles in the rare biosphere through improved OTU clustering. *Environ. Microbiol.* 12: 1889–1898.
- Lasek-Nesselquist, E., D.B. Mark Welch, and M.S. Sogin. 2010. The identification of a new *Giardia duodenalis* assemblage in marine vertebrates and preliminary analysis of *G. duodenalis* population biology in marine systems. *Int. J. Parasitol.* 40: 1063–1074.
- Huber, J.A., H.V. Cantin, S.M. Huse, D.B. Mark Welch, M.L. Sogin and D.A. Butterfield. 2010. Isolated communities of *Epsilonproteobacteria* in hydrothermal vent fluids of the Mariana Arc seamounts. *FEMS Microbiology Ecology* 73: 538–549.
- Gribble, K.E., T.W. Snell and D.B. Mark Welch. 2011. Gene and protein structure of the mate recognition protein gene family in *Brachionus manjavacas* (Rotifera). *Hydrobiologia* 662: 35–42.
- Smith, H.A., D.B. Mark Welch, and T.W. Snell. 2011. Molecular evolution of the membrane associated progesterone receptor within the *Brachionus plicatilis* (Rotifera) cryptic species complex. *Hydrobiologia* 662: 99–106.
- Oleksiak, M., S. Karchner, M. Jenny, D. Franks, D. Mark Welch, and M. Hahn, 2011. Transcriptomic assessment of resistance to effects of an aryl hydrocarbon receptor (AHR) agonist in embryos of Atlantic killifish (*Fundulus heteroclitus*) from a marine Superfund site. *BMC Genomics* 12: 263.
- Post, A.F., S. Penno, K. Zandbank, A. Paytan, S. Huse, and D. Mark Welch, 2011. Long term seasonal dynamics of Synechococcus population structure in the Gulf of Aqaba, Northern Red Sea. *Frontiers in Microbiology* 2: 131.
- Zinger, L., L.A. Amaral-Zettler, J.A. Fuhrman, M.C. Horner-Devine, S.M. Huse, D.B. Mark Welch, J.B.H. Martiny, M. Sogin, A. Boetius, and A. Ramette, 2011. Global patterns of bacterial beta-diversity in seafloor and seawater ecosystems. *PLoS One* 6: e24570.
- Tedom J, Penlap V, Kieft R, McArthur A, Mbacham W, Mark Welch, D.B., Hajduk, S., Titanji, V. 2012. Molecular typing of Mycobacterium tuberculosis isolates from Yaoundé reveals RIF resistance markers, clonal relatedness and mutation patterns. *Asian Pacific Journal of Tropical Disease* 2: 342–347.
- Freitas, S., S. Hatosy, J.A. Fuhrman, S.M. Huse, D.B. Mark Welch, M.L. Sogin, and A.C. Martiny. 2012. Global distribution and diversity of marine Verrucomicrobia. *ISME J.* 6: 1499–1505.
- Gribble, K.E. and D.B. Mark Welch. 2012. The role of the mate recognition protein gene family in the evolution of the cryptic species complex *Brachionus plicatilis* (Rotifera, Monogononta). *BMC Evolutionary Biology* 12: 134.
- Amend A.S., T.A. Oliver, L.A. Amaral-Zettler, A. Boetius, J.A. Fuhrman, M.C. Horner-Devine, S.M. Huse, D.B. Mark Welch, A.C. Martiny, A. Ramette, L. Zinger, M.L. Sogin and J.H. Martiny. 2012. Macroecological patterns of marine bacteria on a global scale. *Journal of Biogeography* 40: 800–811.

- Gribble, K.E. and D.B. Mark Welch. 2013. Lifespan extension by caloric restriction is determined by type and level of food reduction and by reproductive mode in *Brachionus manjavacas* (Rotifera). *J Gerontol A Biol Sci Med Sci*. 68: 349–358.
- Hanson, S.J., Schurko, A.M., B. Hecox-Lea, D.B. Mark Welch, C-P. Stelzer, and J.M. Logsdon. 2013. Inventory and phylogenetic analysis of meiotic genes in monogonont rotifers. *J. Heredity*. 104: 357–370.
- Hanson, S.J., C-P. Stelzer, D.B. Mark Welch, and J.M. Logsdon. 2013. Comparative transcriptome analysis of obligately asexual and cyclically sexual rotifers reveals genes with putative functions in sexual reproduction, dormancy, and asexual egg production. *BMC Genomics* 14: 412.
- Flot, J.-F., B. Hespels, X. Li, B. Noel, I. Arkhipova, E. G. J. Danchin, A. Hejnol, B. Henrissat, R. Koszul, J.-F. Aury, V. Barbe, R. Barthelemy, J. Bast, G. A. Bazykin, O. Chabrol, A. Couloux, M. Da Rocha, C. Da Silva, E. Gladyshev, P. Gouret, O. Hallatchek, B. Hecox-Lea, K. Labadie, B. Lejeune, O. Piskurek, J. Poulain, F. Rodriguez, J. F. Ryan, O. A. Vakhrusheva, B. Wirth, I. Yushenova, M. Kellis, A. S. Kondrashov, D. B. Mark Welch, P. Pontarotti, J. Weissenbach, P. Wincker, O. Jaillon, and K. Van Doninck. 2013. Genomic evidence for ameiotic evolution in the bdelloid rotifer *Adineta vaga*. *Nature* 500: 453–457.
- Gribble, K.E., O. Kaido, G. Jarvis, O. Kaido, and D.B. Mark Welch. 2014. Patterns of intraspecific variability in the response to caloric restriction. *Exp. Gerontology* 51: 28–37.
- Wey-Fabrizius, A.R., H. Herlyn, B. Rieger, A. Witek, D. Rosenkranz, A. Witek, D.B. Mark Welch, I. Ebersberger, and T. Hankein. 2014. Transcriptome data reveal syndermatan relationships and suggest the evolution of endoparasitism in Acanthocephala via an epizotic stage. *PLoS ONE* 9: e88618.
- Huse, S.M., D.B. Mark Welch, A. Voorhis, A. Shipunova, H.G. Morrison, A.M. Eren, and M.L. Sogin. 2014. VAMPS: a website for visualization and analysis of microbial population structures. *BMC Bioinformatics* 15: 41.
- Gribble, K.E., G. Jarvis, M. Bock, and D.B. Mark Welch. 2014. Maternal caloric restriction partially rescues the deleterious effects of advanced maternal age on offspring. *Aging Cell* 13: 623–630.
- Mark Welch, J.L., D.R. Utter, B.J. Rossetti, D.B. Mark Welch, A.M. Eren, and G.G. Borisy. 2014. Dynamics of tongue microbial communities with single-nucleotide resolution using oligotyping. *Frontiers in Microbiology* 5: 568.
- Snell, T.W., R.K. Johnston, K.E. Gribble, and D.B. Mark Welch. 2015. Rotifers as experimental tools for investigating aging. *Invert Rep Dev* 59 (sup1): 5–10.
- Sielaff, M., H. Schmidt, T.H. Struck, D. Rosenkranz, D.B. Mark Welch, T. Hankeln, and H. Herlyn. 2015. Phylogeny of Syndermata (syn. Rotifera): Mitochondrial gene order verifies epizotic Seisonidea as sister to endoparasitic Acanthocephala (thorny-headed worms) within monophyletic Hemirotifera. *Mol. Phylogenet. Evol.* 96: 79–92.
- Mills, S., J.A. Alcántara-Rodríguez, J. Ciroso-Pérez, A. Gómez, A. Hagiwara, K. Hinson Galindo, C.D. Jersabek, R. Malekzadeh-Viayeh, F. Leasi, J-S. Lee, D.B. Mark Welch, S. Papakostas, S. Riss, H. Segers, M. Serra, R. Shiel, R. Smolak, T.W. Snell, C-P. Stelzer, C.Q. Tang, R.L. Wallace, D. Fontaneto, and E.J. Walsh. 2016. Fifteen species in one: deciphering the *Brachionus plicatilis* species complex (Rotifera, Monogononta) through DNA taxonomy. *Hydrobiologia* doi:10.1007/s10750-016-2725-7.
- Kaneko G., T. Yoshinaga, K.E. Gribble, D.B. Mark Welch, H. Ushio. 2016. Measurement of survival time in *Brachionus* rotifers: synchronization of maternal conditions. *J. Vis. Exp.* (113), e54126, doi:10.3791/54126.

- Mark Welch, D.B., A. Jauch, J. Langowski, A.L. Olins and D.E. Olins. 2017. Transcriptomes reflect the phenotypes of undifferentiated, granulocyte and macrophage forms of HL-60/S4 cells. *Nucleus* 8(2): 222–237 doi:10.1080/19491034.2017.1285989.
- Teif, V.B., J-P Mallm, T. Sharma, D.B. Mark Welch, K. Rippe, R. Eils, J. Langowski, A.L. Olins, and D.E. Olins. 2017. Nucleosome repositioning during differentiation of a human myeloid leukemia cell line. *Nucleus* 8(2):188–204.
- Gribble, K.E. and D.B. Mark Welch. 2017. Genome-wide transcriptomics of aging in the rotifer *Brachionus manjavacas*, an emerging model system. *BMC Genomics* 18:217.

non-refereed journal articles

- Meselson, M and D.B. Mark Welch. 2007. Stable heterozygosity? *Science* 318: 202–203.
- Sogin, M.L., Morrison, H., McLellan, S., Mark Welch, D.B., and S.M. Huse. 2010. The rare biosphere: sorting out fact from fiction. *Genome Biology* 11 (Suppl 1): I19.
- GIGA Community of Scientists. 2014. The Global Invertebrate Genomics Alliance (GIGA): Developing community resources to study diverse invertebrate genomes. *J Hered* 105: 1–18.

chapters in books

- Mark Welch, D.B., 2002. Rotifera, pp 304–306. In: *McGraw-Hill Yearbook of Science and Technology*, McGraw-Hill, New York.
- Mark Welch, D.B. 2007. Rotifera, In: *McGraw-Hill Encyclopedia of Science and Technology*, 10th Edition.
- Mark Welch, D.B. 2007. Bdelloidea, In: *McGraw-Hill Encyclopedia of Science and Technology*, 10th Edition.
- Mark Welch, D.B., C. Ricci, and M. Meselson. 2009. Bdelloid rotifers: understanding the success of an evolutionary scandal. Pp 259–279 In: *Lost Sex: The Evolutionary Biology of Parthenogenesis*, K. Martens and I. Shoen, eds. Springer-Verlag, Heidelberg.
- Mark Welch, D.B. 2010. Monogononta, In: *McGraw-Hill Encyclopedia of Science and Technology*, 11th Edition.
- Huse, S.M. and D.B. Mark Welch. 2011. Accuracy and quality of massively parallel DNA pyrosequencing. pp 149–156 In, *Handbook of Molecular Microbial Ecology I: Metagenomics and Complementary Approaches*, de Bruijn, F.J., ed. Wiley and Sons.
- Mark Welch, D.B. and S.M. Huse. 2011. Microbial diversity in the deep sea and the underexplored “rare biosphere.” Pp 245–252 In, *Handbook of Molecular Microbial Ecology II: Metagenomics in Different Habitats*. de Bruijn, F.J., ed. Wiley and Sons.
- Mark Welch, D.B. 2012. Seisonidea, In: *McGraw-Hill Encyclopedia of Science and Technology*, 11th Edition. McGraw-Hill, New York.
- Huse, S.M., D.B. Mark Welch, and M.L. Sogin. 2013. Sequencing errors, diversity estimates and the rare biosphere. Pp 188–207 In, *The Science and Applications of Microbial Genomics: Workshop Summary*, Institute of Medicine. Washington, DC: The National Academies Press.
- Mark Welch, D.B. Using Comparative Biology to Reveal Mechanisms of Aging in Rotifers. In, *Handbook of Models of Human Aging, 2nd edition*. Conn, M and J Ram, J. editors. Academic Press/Elsevier (in press).

Presentations

a. invited presentation (university departments, professional meetings, and workshops)

- 2000 - IXth International Rotifer Symposium, Khon Kaen, Thailand
 - International Symposium on the Evolution of Sex in Memory of W.D. Hamilton, Kyushu, Japan
- 2001 - Georgia Technical Institute, Atlanta GA
 - VIIIth Congress of the European Society for Evolutionary Biology, Aarhus, Denmark
- 2002 - University of New Brunswick, Fredrickton NB, Canada
 - Dalhousie University, Halifax NS, Canada
 - Royal Entomological Society-Linnean Society Symposium on Intraclonal Genetic Variation: Ecological and Evolutionary Aspects, London, UK.
- 2003 - University of Milan, Milan, Italy
 - European Science Foundation Parthenogenesis Network Workshop: Asexuality and Timescales, Wageningen, the Netherlands
- 2004 - McGill University, Montreal, Canada
 - Imperial College, London, UK
- 2005 - University of Maryland, College Park, MD
 - University of Massachusetts, Boston, MA
 - European Science Foundation Parthenogenesis Network Workshop: The paradox of asexuality, London, UK
- 2006 - Wenner-Gren Foundation: Mutation, Selection, and Genome Evolution, Stockholm, Sweden
 - Gordon Research Conference: Meiosis, New London NH
 - Indiana University, Bloomington, IN
- 2007 - IIIth International Conference on Apomixis, Wernigerode, Germany
 - Darmstadt University, Darmstadt, Germany
- 2008 - University of Texas, Austin TX
 - University of Massachusetts, Amherst MA
 - University of Rhode Island, Kingston RI
 - Cornell University, Ithaca NY
- 2009 - American Society for Microbiology Special Colloquium on the Rare Biosphere, San Francisco CA
 - American Society for Microbiology 109th General Meeting Symposium, "The Rare Biosphere: An Emerging Paradigm for Microbiology" Philadelphia PA
 - Evolution of Sex and Recombination, University of Iowa
 - XIIth International Rotifer Symposium, Berlin Germany
 - XIIth Congress of the European Society for Evolutionary Biology, Turin Italy
 - Sloan Foundation Workshop on the Indoor Environment, Chicago
- 2010 - Annual Meeting of the Society for Molecular Biology and Evolution, Lyons
 - University of Colorado, Boulder CO
 - Sloan Foundation Workshop on Indoor Metagenomics, Indian Lakes IL
- 2011 - Darwin Day speaker, Rutgers University
- 2012 - 41th Annual Meeting of the American Aging Association, Ft Worth TX
 - Northeastern University, Boston MA
- 2014 - VII Nicaraguan Biotechnology Conference, Montelimar, Nicaragua
- 2015 - Frontiers in Aging and Regeneration Research, Woods Hole MA
- 2016 - 22nd International Congress of Zoology, Okinawa Japan
- 2017 - 8th Aquatic Animal Models of Human Disease, Birmingham AL
 - 14th International Congress on Reproduction and Development, Naples Italy

b. other presentations

- 1994 - Society for the Study of Evolution, Montreal, QC
- 1994 - VIIth International Rotifer Symposium, Mikilajki, Poland
- 1995 - New England Molecular Evolution Conference, Storrs, CT
- 1997 - VIIIth International Rotifer Symposium, Colledgeville, MN
- 2003 - Xth International Rotifer Symposium, Illmitz, Austria
- 2004 - European Science Foundation Parthenogenesis Network Workshop: Diversity in asexuals - Patterns and processes, Muenster, Germany
- 2005 - Xth Congress of the European Society for Evolutionary Biology, Krakow
- 2006 - Evolution2006 (Society for the Study of Evolution), Stony Brook, NY
- XIth International Rotifer Symposium, Mexico City
- 2007 - SIL2007 (Societas Internationalis Limnologiae), Montreal, QC
- 2010 - International Census of Marine Life, London
- 2011 - 40th Annual Meeting of the American Aging Association, Raleigh NC
- 2012 - Gordon Research Conference on the Biology of Aging, Ventura CA
- Gordon Research Conference on DNA Damage, Mutation, and Cancer
- Gordon Research Conference on the Biology of Post-Transcriptional Gene Regulation
- Cold Spring Harbor Meeting on the Molecular Genetics of Aging
- 2013 - 42nd Annual Meeting of the American Aging Association, Baltimore MD
- 2014 - Society for Molecular Biology and Evolution, San Juan, Puerto Rico
- 2015 - XIVth International Rotifer Symposium, České Budějovice, Czech Republic
- 2016 - Gordon Research Conference on Ocean Global Change Biology, Winterville Valley, NH

Research Grants

a. current grants

- NSF CCF-1539291 "CyberSEES: Type 2: Collaborative Research: A Computational and Analytic Laboratory for Modeling and Predicting Marine Biodiversity and Indicators of Sustainable Ecosystems" Principle Investigator 09/01/2015-08/31/2018 \$151,236
- NIH NIGMS R25 GM106988-01 "*Strategies and Techniques for Analyzing Microbial Population Structures*" Course co-Director (R. Nishi, PI), 09/15/2013-05/31/2018, \$673,976
- NSF DBI-1262592 "ABI Sustaining: A visualization and analysis resource for comparative microbial ecology" Principle Investigator, 9/01/13-8/31/17, \$702,633
- Smithsonian Institution "Encyclopedia of Life (EOL) SI Care Biodiversity Informatics" Principle Investigator, 2/01/2014-09/30/2017, \$500,000
- Amgen Biotech "Memorandum of Understanding between the President and Fellows of Harvard College and the Marine Biological Laboratory" 7/1/15-6/30/17 \$32,340
- NSF SES-1534188 "New Approaches to Interpreting the Development of Science at the Marine Biological Laboratory" 8/1/15-7/31/18 (J. Maeinschien, PI) \$184,671
- James S. McDonnell Foundation "Pilot project linking life science with history and philosophy of science" 12/1/16-11/30/17 (J. Maeinschien, PI) \$501,419

b. completed grants

- Arthur Vining Davis Foundation “Discover the Microbes Within! The Wolbachia Project Phase II: Introducing Pre-Service Teachers to Discovering Science” Principle Investigator, 06/01/2014–5/31/2017, \$150,000
- NIH R21 AG046899 “Novel Antioxidant Defenses and Redox Maintenance Systems in Bdelloid Rotifers” Principle Investigator, 09/01/14–05/31/17, \$431,393
- NSF DBI–1356347 “ABI Development: Global Names Discovery, Indexing, and Reconciliation Services” Principle Investigator, 08/01/14–07/31/16, \$758,188
- NIH NIA R01 AG037960-01 “*Monogonont rotifers as a model to investigate the biology of aging*” Principle Investigator on MBL subcontract (with T. Snell, PI) 09/01/10–08/31/16, \$769,875 (MBL portion)
- NSF BDI-096026 “Expanding visualization and analysis tools for comparative microbial ecology (VAMPS 2.0)” Senior personnel, (S. Huse, Principle Investigator), 08/01/10–07/30/14
- NSF DBI-1039946 “MRI: Acquisition of an Illumina GAIx for Genomics and Microbial Ecology” co-PI (with three other investigators), 08/01/10–07/31/13, \$548,090
- NSF MCB “Molecular Genetics of Bdelloid Rotifers” Principle Investigator, 09/01/09–08/31/12, \$500,000
- WHOI-OLI “Transcriptome Analysis by Pyrosequencing: A New Tool for Assessing the Response of Marine Animals to Environmental Stress” co-Principal Investigator with two others, 05/15/08–05/14/09, \$75,959.
- Sloan Foundation 2008-6-20 “The Rare Biosphere and the Human Habitat” co-Principle Investigator (with M.L. Sogin), 07/01/08–12/31/12, \$1,215,100
- NSF MCB “*Molecular Genetics of Bdelloid Rotifers*” Principle Investigator, 05/01/06–04/30/09, \$597,066
- NIH NIGMS 1R01GM079484 “Evolution of Meiotic Genes in Sexual and Asexual Rotifers” co-Investigator (with J. Logsdon), 07/01/07–06/30/13, \$750,000
- Eppley Foundation for Research ““Exploration of the innate immune response of anciently asexual animals: a potentially novel system for combating pathogens” Principle Investigator, 02/01/05–01/31/06, \$23,543
- NSF Emerging Frontiers 0412674 “Gen/En: A Biochemical, Genetic, and Genomic Investigation of the Evolution and Ecology of Sexual Reproduction” Principle Investigator with 2 others, 09/01/04–08/31/10, \$931,412 (MBL portion of a multi-institution award)
- NSF MCB “Molecular Genetics of Bdelloid Rotifers” co-Investigator, 02/01/02–01/31/06, \$629,802

c. proposals submitted

- NSF ABI “Sustaining: A Web-based Platform-independent Tool for Visualization and Analysis of Microbial Population Structures, Principle Investigator, 09/01/2017–08/31/2020, \$547,159

Service

a. to the University/MBL

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| 2004–present | MBL Corporation/Society member |
| 2008–2013 | Chair, MBL Radiation Safety Committee |
| 2008/2009 | Graduate Admissions Committee, Department of Ecology and Evolutionary Biology, Brown University |

2009–2012	MBL Committee on Awards and Scholarships
2010–2014	Chair, MBL Institutional Biosafety Committee
2010–2014	MBL Science Council
2010–2014	Chair, MBL Institutional Biosafety Committee
2011–2013	Chair, MBL-WHOI Library Users Committee
2011–2012	Graduate Admissions Committee, Department of Molecular Biology, Cell Biology, and Biochemistry, Brown University
2013	Associate Director, Josephine Bay Paul Center for Comparative Molecular Biology and Evolution
2013–present	Director, Josephine Bay Paul Center for Comparative Molecular Biology and Evolution
2015	co-Convener, MBL Vision Team, “Ecological and Evolutionary Trajectories in a Changing World”
2016–present	Associate Director, The Microbiome Center, University of Chicago-MBL-Argonne National Laboratory

b. to the profession

ad hoc Referee for the NSF, NIH, European Science Foundation, Natural Environment Research Council (UK), and the New Zealand Academy of Sciences.

Guest editor for *Proc Nat Acad Sci.*; referee of manuscripts for numerous journals including *Biol J Linn Soc*, *BMC Ecology*, *BMC Evo Biol*, *Evolution*, *Genetics*, *J Evol Biol*, *J Mol Evol*, *Mol Biol Evol*, *Mol Ecology*, *Mol Genom Evol*, *Mol Phylogenet Evol*, *Nature Letters*, *Nature Reviews Genetics*, *PLoS Biology*, *PLoS ONE*, *Proc Nat Acad Sci*, *Proc R Soc*, and *Science*.

2010 Organizer and Chair, *Alpha Diversity Working Group for the International Census of Marine Microbes*, Bremen, Germany.

2011 Co-organizer, *2nd Beta Diversity Working Group for the International Census of Marine Microbes*, Los Angeles CA

2011–present coordinator of computational resources for the MBL Special Topics Course *Workshop on Molecular Evolution*

2015 Scientific Committee, XIV International Rotifer Symposium

2017 Scientific Committee, 9th Aquatic Animal Models of Human Disease (Woods Hole MA, 2018)

9. Teaching and Training (last five years)

Undergraduate Training

2011–2012	Norian Caporale-Berkowitz, Brown/MBL Beckman Scholar and Senior Thesis advisee
2012	Oksana Kaido, Northeastern University co-operative education student
2012	George Jarvis, Northeastern University co-operative education student
2012	Justin Waraniak, REU undergraduate in MBL’s “Scientific Discovery in Woods Hole” Program
2013	Martha Brock, Northeastern University co-operative education student
2013–2014	Beverly Naigles, Brown/MBL Beckman Scholar
2014	Trevor Young, Brown/MBL Beckman Scholar
2014	Alexis White, REU undergraduate in MBL’s “Scientific Discovery in Woods Hole” Program
2014	Hollis Jones, Northeastern University co-operative education student
2015	Shannon Jones, Northeastern University co-operative education student

- 2015 Benjamin Moran, Northeastern University co-operative education student
 2015 Claudia Vesel, REU undergraduate in MBL's "Scientific Discovery in Woods Hole" Program
 2016 Isa Alvarez, University of Chicago Metcalf Scholar
 2016 Lawrence Shelven, REU undergraduate in MBL's "Scientific Discovery in Woods Hole" Program

Graduate Training: Advisees

- Anupriya Dutta, Dept of MCB, Brown University (PhD, 2013)
 Bette Hecox-Lea, Dept of Biology, Northeastern University (PhD, exp 2017)

Graduate Training: Thesis Committees

- Erica Lasek-Nesselquist, Dept EEB, Brown University (PhD, 2010)
 Hilary Smith, School of Biology, Georgia Institute of Technology (PhD, 2012)
 John Urban, Dept MCB, Brown University (PhD, 2016)
 Matthew Booker, Dept MCB, Brown University (PhD, 2016)
 Victor Schmidt, Dept EEB, Brown University (PhD, 2016)
 Matthew Hirakawa, Dept MMI, Brown University (PhD, 2017)
 John Santiago, Dept MCB, Brown University (PhD, exp 2019)

Undergraduate Teaching

- 2015 *Experimental Biology by the Sea* (BIOS17101). University of Chicago off-campus semester "The Whale: Biology, Culture, and Evolution on Nantucket Sound."
 2017 Microbiomes Across Environments (BIOS 27720). University of Chicago September MBL course.

Graduate Teaching

- 2010–2015 *Foundations for Advanced Study in Experimental Biology* (BIOL2030) Team-taught seminar course for first year graduate students in the Department of Molecular Biology, Cell Biology, and Biochemistry at Brown University
 2012–2016 *Computational Integration of Genomes, Organism and Environments* (BIOL2430) IGERT core course in reverse ecology, Brown-MBL Graduate Program

Post Graduate Teaching

- 2011– MBL, *Strategies and Techniques for Analysis of Microbial Population Structures*: co-founder and Co-Director of MBL Summer Special Topics Course for 60-65 students (graduate students, postdocs, PIs) covering bioinformatics of next-gen sequencing based molecular microbial ecology.
 2017 *Getting Involved in Microbiome Research for Clinicians: From Sequencing to Grant Writing*. Training course for physicians sponsored by The Microbiome Center.