

Jessica L. Mark Welch

Associate Research Scientist

Josephine Bay Paul Center, Marine Biological Laboratory, 7 MBL Street, Woods Hole, MA 02543

Telephone (508) 289-7180, e-mail jmarkwelch@mbl.edu

ADDRESS: 7 MBL Street, Woods Hole, MA 02543

EDUCATION:

- 1989 B.A. *magna cum laude*, Harvard and Radcliffe Colleges, Biology
- 1990-1992 Freie Universität Berlin, Germany. Graduate work in chemistry and biology. Advisor: Walter Sudhaus
- 2001 Ph.D., Harvard University Department of Molecular and Cellular Biology
Advisor: Matthew Meselson.
Dissertation topic: Cytological Evidence for the Absence of Meiosis in Bdelloid Rotifers.
- 2001-2006 Postdoctoral training, Marine Biological Laboratory, Woods Hole, part-time
- 2006-2009 Postdoctoral training, Marine Biological Laboratory, Woods Hole, full-time
Advisors: Matthew Meselson and Gary Borisy

PROFESSIONAL APPOINTMENTS:

- 2009 – 2015 Assistant Research Scientist, Josephine Bay Paul Center for Comparative Molecular Biology and Evolution, Marine Biological Laboratory, Woods Hole, MA; appointed to Associate Research Scientist in July 2015
- 1989 – 1990 Research Assistant, Environmental Law Institute, Washington, DC

PUBLICATIONS:

REFEREED JOURNAL ARTICLES:

Mark Welch, Jessica L., Blair J. Rossetti, Christopher W. Rieken, Floyd E. Dewhirst, and Gary G. Borisy (2016). Biogeography of a human oral microbiome at the micron scale. *Proceedings of the National Academy of Sciences (USA)* published on line before print, January 25, 2016. PNAS.1522149113

Dejea, C.M., E.C. Wick, E.M. Hechenbleikner, J.R. White, **J.L. Mark Welch**, B.J. Rossetti, S.N. Peterson, E.C. Snesrud, G.G. Borisy, M. Lazarev, E. Stein, J. Vadivelu, A.C. Roslani, A.A. Malik, J.W. Wanyiri, K.L. Goh, I. Thevambiga, K. Fu, F. Wan, N. Llosa, F. Housseau, K. Romans, X. Wu, F.M. McAllister, S. Wu, B. Vogenstein, K.W. Kinzler, D.M. Pardoll, and C.L. Sears (2014). Microbiota organization is a distinct feature of proximal colorectal cancers. *Proceedings of the National Academy of Sciences (USA)* 111: 18321-18326.

Mark Welch, Jessica L., Daniel R. Utter, Blair J. Rossetti, David B. Mark Welch, A. Murat Eren, and Gary G. Borisy (2014). Dynamics of tongue microbial communities with single-nucleotide resolution using oligotyping. *Frontiers in Microbiology* 5: 568.

Eren, A. Murat, Gary G. Borisy, Susan M. Huse, and **Jessica L. Mark Welch** (2014). Oligotyping analysis of the human oral microbiome. *Proceedings of the National Academy of Sciences (USA)* 111: E2875-E2884.

Valm, Alex M., **Jessica L. Mark Welch**, and Gary G. Borisy (2012). CLASI-FISH: Principles of Combinatorial Labeling and Spectral Imaging. *Systematic and Applied Microbiology* 35(8): 496-502. PMID: PMC3407316.

Sukenik, Assaf, Ruth N. Kaplan-Levy, **Jessica Mark Welch**, and Anton F. Post (2012). Massive multiplication of genome and ribosomes in dormant cells (akinetes) of *Aphanizomenon ovalisporum* (Cyanobacteria). *The ISME Journal* 6(3): 670-679. PMID: PMC3280138.

Valm, Alex M., **Jessica L. Mark Welch**, Christopher W. Rieken, Yuko Hasegawa, Mitchell L. Sogin, Rudolf Oldenbourg, Floyd E. Dewhirst, and Gary G. Borisy (2011). Systems-level analysis of microbial community organization through combinatorial labeling and spectral imaging. *Proceedings of the National Academy of Sciences (USA)* 108: 4152-4157.

Hasegawa, Yuko, **Jessica L. Mark Welch**, Alex M. Valm, Christopher W. Rieken, Mitchell L. Sogin, and Gary G. Borisy (2010). Imaging marine bacteria with unique 16S rRNA V6 sequences by fluorescence *in situ* hybridization and spectral analysis. *Geomicrobiology Journal* 27: 251-260.

Mark Welch, David B., **Jessica L. Mark Welch**, and Matthew Meselson (2008). Evidence for degenerate tetraploidy in bdelloid rotifers. *Proceedings of the National Academy of Sciences (USA)* 105: 5145-5149.

Mark Welch, David B., and **Jessica L. Mark Welch** (2005). The potential of genomic approaches to rotifer ecology. *Hydrobiologia* 546: 101-108.

Mark Welch, Jessica L., David B. Mark Welch, and Matthew Meselson (2004). Cytogenetic evidence for asexual evolution of bdelloid rotifers. *Proceedings of the National Academy of Sciences (USA)* 101: 1618-1621.

Mark Welch, Jessica L., and Matthew Meselson (1998). Karyotypes of bdelloid rotifers from three families. *Hydrobiologia* 387/388: 403-407.

Knoll, A.H., K. Swett, and **J. Mark** (1991). Paleobiology of a Neoproterozoic tidal flat/lagoonal complex: the Draken Conglomerate Formation, Spitsbergen. *Journal of Paleontology* 65: 531-570.

SUBMITTED ABSTRACTS SELECTED FOR ORAL PRESENTATION:

Mark Welch, Jessica L., Blair Rossetti, Livia Valverde, Steven Wilbert, and Gary G. Borisy. 2015. Spatial Organization of the Plaque Microbiome at the Micron Scale. 2015 Boston Bacterial Meeting, Cambridge, Massachusetts, June 19, 2015.

Mark Welch, Jessica L., Gary G. Borisy, Susan M. Huse, and A. Murat Eren. 2014. Differences in Biofilm Composition Among Micro-Habitats and Subjects at High Resolution Using Oligotyping. American Society for Microbiology General Meeting, Boston, Massachusetts, May 18, 2014.

Mark Welch, Jessica L., Alex M. Valm, Blair Rossetti, Carissa McKinney, Floyd E. Dewhirst, and Gary G. Borisy. 2012. Visualizing the Spatial Organization of Microbes in Biofilms using Combinatorial Labeling and Spectral Imaging – Fluorescence in situ Hybridization (CLASI-FISH). American Society for Microbiology, meeting on Biofilms, Miami, Florida, October 3, 2012.

INVITED LECTURES:

Mark Welch, Jessica L. (2015). Spatial organization of the plaque microbiome at the micron scale. Wellcome Trust / NIH-RAPIDD meeting on Unlocking the Microbiome, London, September 2, 2015.

Mark Welch, Jessica L. (2015). Architecture of Oral Microbial Biofilms with CLASI-FISH. Penn Periodontal Conference, Philadelphia, PA, June 30, 2015.

Mark Welch, Jessica L. (2015). Spatial Organization of Microbial Communities. Invited lecture in the seminar series of the University of New England, College of Pharmacy, Portland, ME, April 13, 2015.

Mark Welch, Jessica L. (2015). Analyzing Spatial Organization in the Human Microbiome using Spectral Imaging and Multiplexed Fluorescence *in situ* Hybridization. Invited lecture at Experimental Biology 2015 in Boston, MA as part of the Histochemical Society annual meeting, Stowell Symposium on Unlocking New Tools for Experimental Pathology: Advances in Detection Systems, from Super Resolution Microscopy to Whole Animal Imaging. March 28, 2015.

Mark Welch, Jessica L. (2013). Visualizing the Spatial Organization of Microbes in Oral Biofilms. Center for Biofilm Engineering, Bozeman, MT, "Montana Biofilm Meeting," July 16, 2013.

ACADEMIC HONORS:

B.A. magna cum laude in Biology, Harvard and Radcliffe Colleges, 1989

TEACHING:

Faculty in the MBL special topics course “Optical Microscopy and Imaging in the Biological Sciences”, lecturing on Multispectral Imaging, 2013 – 2014.

Guest lecturer on the Human Microbiome in Brown University course “Introduction to Microbiology,” 2010-present.

Advised Partnership Education Program undergraduate Daniel Utter (summer 2014 and 2015) and MBL Research Experiences for Undergraduates students Carissa McKinney (summer 2012) and Kurt Isaac-Elder (summer 2010) as well as summer interns Braden Tierney (summer 2010-2013) and Jake Casper (summer 2010-2011).