

JACOB R. WALDBAUER

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APPOINTMENTS

2012-Present **University of Chicago, Department of the Geophysical Sciences**
Neubauer Family Assistant Professor (2012-present)
Committee on Microbiology (2016-present)

EDUCATION & EXPERIENCE

2010-2011 **California Institute of Technology, Geological & Planetary Sciences**
Postdoctoral Fellow in Geobiology
Advisors: Jess F. Adkins & Alex L. Sessions

2010 **Massachusetts Institute of Technology/Woods Hole Oceanographic Institution**
Joint Program in Oceanography
Ph.D. in Chemical Oceanography
Advisors: Sallie W. Chisholm & Roger E. Summons

2001-2004 **Stanford University, Geological & Environmental Sciences**
Lab Manager, Stable Isotope Biogeochemistry
Supervisor: C. Page Chamberlain

2001 **Dartmouth College**
A.B. in Physics & Astronomy *summa cum laude*

AWARDS & HONORS

2016-2019 Simons Foundation Early Career Investigator in Marine Microbial Ecology and Evolution

2013-2015 Alfred P. Sloan Research Fellowship

2012-2017 Neubauer Family Faculty Fellowship

2011 National Academy of Sciences Cozzarelli Prize

2010-2011 Beckman Institute Postdoctoral Fellowship

2010-2011 Stanback Postdoctoral Fellowship in Environmental Science & Engineering

2007-2009 National Science Foundation Graduate Research Fellowship

2004-2007 National Defense Science & Engineering Graduate Fellowship

SELECTED PROFESSIONAL ACTIVITIES & SERVICE

2021 Theme Co-Chair, "Geobiology: life in geological processes", Goldschmidt 2021

2020 Invited speaker, "New and Emerging Tools in Geobiology", Geobiology Gordon Research Conference

2018 Co-Convener, "Advances in Understanding the Role of Microbes and Animals in Governing Biogeochemical Fluxes at Local and Global Scales", Goldschmidt Conference 2018

2018 Working group, "Microbial Communities to Mitigate Climate Change", Marine Biological Laboratory

2017	Theme Co-Chair, “Geo-omics meets Organic Geochemistry”, Goldschmidt 2017
2015	NSF ECOGEO Research Coordination Network workshop, University of Hawaii
2014	Co-Organizer, Midwest Geobiology Symposium
2014	Working group, “Linking Marine Microbes and the Molecules of Dissolved Organic Matter”, Moore Foundation/Microsoft Research
2013	Instructor, Environmental Virology workshop, University of Arizona
2012	Biomarker Workshop, Agouron Institute
Ongoing	Reviewer for <i>PNAS</i> , <i>Nature</i> , <i>Geology</i> , <i>Organic Geochemistry</i> , <i>ISME Journal</i> , <i>Nature Communications</i> , <i>Geochimica et Cosmochimica Acta</i> , <i>FEMS Microbiology Letters</i> , <i>BioEssays</i> , <i>Environmental Microbiology</i> , <i>Chemical Geology</i> , <i>Molecular Ecology</i> , <i>PeerJ</i> , <i>Journal of Proteome Research</i> , <i>Paleobiology</i> , <i>Limnology & Oceanography</i> , <i>Nature Geoscience</i>
Ongoing	Ad hoc reviewer/panelist for NSF Biological Oceanography, Chemical Oceanography, Low Temperature Geochemistry & Geobiology; NASA Exobiology, Astrobiology; ACS Petroleum Research Fund

TEACHING & MENTORING

Courses Taught

- GEOS 23800: Global Biogeochemical Cycles
- GEOS 26600: Geobiology
- GEOS 33825: Topics in Microbial Biogeochemistry

Graduate Student Primary Advisees

- Gwendolyn Gallagher (Ph.D. in progress)
- Samuel Miller (Ph.D. awarded December 2018)
- Xiufeng Ma (Ph.D. awarded April 2018)

Other Lab Group Members

- Amy Zimmerman (Research Scientist, 2018-present)
- Lichun Zhang (Lab Manager, 2013-present)
- Adriana Rizzo (Technician, 2016-2017)
- Michael Kang (Technician, 2012-2013)

Undergraduate Researchers

- Adriana Rizzo, Kat Stevanovich, Marcus Trybula, Jacob Britz, John Lotus, Hannah Eastman (UChicago), Michael Mulligan (Notre Dame)

PUBLICATIONS

* as corresponding author † as co-first author ° trainee/lab member

Miller, S.E.[°], Colman, A.S. and **Waldbauer, J.R.*** (in revision) Metaproteomics reveals functional partitioning and vegetational variation among Arctic soil bacteria. *ISME Journal*.

Luxem, K.E., Krapiel, A.M.L., Zhang, L.[°], **Waldbauer, J.R.**, and Zhang, X. (2020) Carbon substrate re-orders relative growth of a bacterium using Mo-, V-, or Fe-nitrogenase for N₂ fixation. *Environmental Microbiology* 22: 1397-1408.

Zimmerman, A.E.[°], Howard-Varona, C., Needham, D.M., John, S., Worden, A.Z., Sullivan, M.B., **Waldbauer, J.R.**, and Coleman, M.L. (2020) Metabolic and biogeochemical consequences of viral infection in aquatic systems. *Nature Reviews Microbiology* 18: 21-34.

- Waldbauer J.R.**^{*†}, Coleman M.L.^{*†}, Rizzo A.I.[°], Campbell K.L., Lotus J.M.[°], and Zhang, L.[°] (2019) Nitrogen sourcing during viral infection of marine cyanobacteria. *Proceedings of the National Academy of Sciences* 116: 15590-15595.
- Zimmerman, A.E.[°], Bachy, C., Ma, X.[°], Roux, S., Jiang, H.B., Sullivan, M.B., **Waldbauer, J.R.**, and Worden, A.Z. (2019) Closely-related viruses of the marine picoeukaryotic alga *Ostreococcus lucimarinus* exhibit different ecological strategies. *Environmental Microbiology* 21: 2148-2170.
- Leavitt, W.D., Venceslau, S., **Waldbauer, J.R.**, Smith, D., Pereira, I.A.C., and Bradley, A.S. (2019) Proteomic and isotopic response of *Desulfovibrio vulgaris* to DsrC perturbation. *Frontiers in Microbiology* 10.3389/fmicb.2019.00658.
- Miller, S.E.[°], Rizzo A.I.[°] and **Waldbauer, J.R.**^{*} (2018) Postnovo: Post-Processing Enables Accurate and FDR-Controlled *De Novo* Peptide Sequencing. *Journal of Proteome Research*. 17: 3671-3680.
- Ma, X.[°], Coleman, M.L. and **Waldbauer, J.R.**^{*} (2018) Distinct molecular signatures in dissolved organic matter produced by viral lysis of marine cyanobacteria. *Environmental Microbiology* 20: 3001-3011.
- Waldbauer, J.R.**^{*}, Zhang, L.[°], Rizzo, A.I.[°] and Muratore, D. (2017) diDO-IPTL: A Peptide-Labeling Strategy for Precision Quantitative Proteomics. *Analytical Chemistry* 89: 11498-11504.
- Schwartz, M., **Waldbauer, J.R.**, Zhang, L.[°] and Pan, T. (2016) Global tRNA misacylation induced by anaerobiosis and antibiotic exposure broadly increases stress resistance in *Escherichia coli*. *Nucleic Acids Research* 44: 10292-10303.
- Moran, M.A., Kujawinski, E.B., Stubbins, A., Fatland, R., Aluwihare, L.I., Buchan, A., Crump, B.T., Dorrestein, P.C., Dyhrman, S.T., Hess, N., Longnecker, K., Medeiros, P.M., Niggeman, J., Obernosterer, I., Repeta, D.J. and **Waldbauer, J.R.** (2016) Deciphering Ocean Carbon in a Changing World. *Proceedings of the National Academy of Sciences* 113: 3143-3151.
- Waldbauer, J.R.**[†], Rodrigue, S.[†], Coleman, M.L. and Chisholm, S.W. (2012) Transcriptome and proteome dynamics of a light-dark synchronized bacterial cell cycle. *PLoS ONE* 7: e43432.
- Waldbauer, J.R.**, Newman, D.K. and Summons, R.E. (2011) Microaerobic steroid biosynthesis and the molecular fossil record of Archean life. *Proceedings of the National Academy of Sciences* 108: 13409-13414.
Paper awarded 2011 NAS Cozzarelli Prize in Class I (Physical and Mathematical Sciences)
- Waldbauer, J.R.**, Sherman, L.S., Sumner, D.Y. and Summons, R.E. (2009) Late Archean molecular fossils from the Transvaal Supergroup record the antiquity of microbial diversity and aerobiosis. *Precambrian Research* 169: 28-47.
- Frias-Lopez, J., Thompson, A.W., **Waldbauer, J.R.** and Chisholm, S.W. (2009) Use of stable isotope labeled cells to identify active grazers of picocyanobacteria in ocean surface waters. *Environmental Microbiology* 11: 512-525.
- Sherman, L.S., **Waldbauer, J.R.** and Summons, R.E. (2007) Improved methods for isolating and validating indigenous biomarkers in Precambrian rocks. *Organic Geochemistry* 38: 1987-2000.
- Martínez, A., Bradley, A.S., **Waldbauer, J.R.**, Summons, R.E. and DeLong, E.F. (2007) Proteorhodopsin photosystem gene expression enables photophosphorylation in a heterologous host. *Proceedings of the National Academy of Sciences* 104: 5590-5595.

- Knoll, A.H., Summons, R.E., **Waldbauer, J.R.** and Zumbege, J.E. (2007) The Geological Succession of Primary Producers in the Oceans. In *The Evolution of Primary Producers in the Sea*, P.G. Falkowski and A.H. Knoll, eds. Academic Press, p. 133-163.
- Newsome, S.D., Etnier, M.A., Kurle, C.M., **Waldbauer, J.R.**, Chamberlain, C.P. and Koch, P.L. (2007) Historic decline in primary productivity in the western Gulf of Alaska and eastern Bering Sea: isotopic analysis of northern fur seal teeth. *Marine Ecology Progress Series* 332: 211-224.
- Hayes, J.M. and **Waldbauer, J.R.** (2006) The carbon cycle and associated redox processes through time. *Philosophical Transactions of the Royal Society B* 361: 931-950.
- Summons, R.E., Bradley, A.S., Jahnke, L.L. and **Waldbauer, J.R.** (2006) Steroids, triterpenoids and molecular oxygen. *Philosophical Transactions of the Royal Society B* 361: 951-968.
- Sjostrom, D.J., Hren, M.T., Horton, T.W., **Waldbauer, J.R.**, and Chamberlain, C.P. (2006) Stable isotopic evidence for a pre-late Miocene elevation gradient in the Great Plains–Rocky Mountain region, USA. In *Tectonics, Climate, and Landscape Evolution*, S.D. Willett, N. Hovius, M.T. Brandon and D.M. Fisher, eds. Geological Society of America Special Paper 398, p. 309-320.
- Chamberlain, C.P., **Waldbauer, J.R.**, Fox-Dobbs, K., Newsome, S.D., Koch, P.L., Smith, D.R., Church, M.E., Chamberlain, S.D., Sorenson, K.J. and Risebrough, R. (2005) Pleistocene to recent dietary shifts in California condors. *Proceedings of the National Academy of Sciences* 102: 16707-16711.
- Chamberlain, C.P., **Waldbauer, J.R.** and Jacobson, A.J. (2005) Strontium, hydrothermal systems and steady-state chemical weathering in active mountain belts. *Earth and Planetary Science Letters* 238: 351-366.
- Waldbauer, J.R.** and Chamberlain, C.P. (2005) Influence of Uplift, Weathering and Base Cation Supply on Past and Future CO₂ Levels. In *A History of Atmospheric CO₂ and Its Effects on Plants, Animals, and Ecosystems*, J.R. Ehleringer, T.E. Cerling and M.D. Dearing, eds. Springer Verlag, p. 166-184.
- Abruzzese, M.J., **Waldbauer, J.R.** and Chamberlain, C.P. (2005) Oxygen and hydrogen isotopes of freshwater chert as indicators of past climate and hydrologic regime. *Geochimica et Cosmochimica Acta* 69: 1377-1390.
- Graham, S.A., Chamberlain, C.P., Yongjun, Y., Ritts, B.D., Hanson, A.D., Horton, T.W., **Waldbauer, J.R.**, Poage M.A. and Feng, X. (2005) Stable isotope records of Cenozoic climate and topography, Tibetan plateau and Tarim basin. *American Journal of Science* 305: 101-118.
- Horton, T.W., Sjostrom, D.J., Abruzzese, M.J., Poage, M.A., **Waldbauer, J.R.**, Hren, M.T., Wooden, J. and Chamberlain, C.P. (2004) Spatial and temporal variation of Cenozoic surface elevation in the Great Basin and Sierra Nevada. *American Journal of Science* 304: 862-888.
- Rubenstein, D.R., Chamberlain, C.P., Holmes, R.T., Ayres, M.P., **Waldbauer, J.R.**, Graves, G.R. and Tuross, N.C. (2002) Linking the breeding and wintering ranges of a neotropical migrant songbird using stable isotopes. *Science* 295:1062-1065.
- Waldbauer, J.R.** and Gazzaniga, M.S. (2001) The divergence of neuroscience and law. *Jurimetrics* 41: 357-364.