

SARAH R. SMITH

8272 Moss Landing Road. Moss Landing, CA 95039 • ssmith@mlml.calstate.edu

CURRENT

Assistant Professor, Moss Landing Marine Laboratories, San José State University, CA *joining: July 2021*
Assistant Professor, J. Craig Venter Institute January 2020 – July 2021

EDUCATION

Ph.D. Marine Biology 2014 Scripps Institution of Oceanography, UCSD, CA
M.S. Marine Science 2009 Moss Landing Marine Laboratories, San José State University, CA
B.S. Biology 2003 Santa Clara University, Santa Clara, CA

PROFESSIONAL APPOINTMENTS

Staff Scientist, J. Craig Venter Institute 2017 – 2020
Advisor: Dr. Andrew E. Allen, Integrative Oceanography Division/JCVI

Postdoctoral Scholar, Scripps Institution of Oceanography/JCVI 2014 – 2017
Advisor: Dr. Andrew E. Allen, Integrative Oceanography Division/JCVI

Graduate Student Researcher/NDSEG Fellow, Scripps Institution of Oceanography, UCSD 2008 – 2014
Advisor: Dr. Mark Hildebrand, Marine Biology Research Division
Dissertation: Coordinate regulation of carbon and energy metabolism at the transcript level in the diatom *Thalassiosira pseudonana*

C-MORE Summer Oceanography Course Participant, University of Hawaii 2012
Program Director: Dave Karl, University of Hawaii

Graduate Research Assistant, Moss Landing Marine Laboratories, San José State University 2005 – 2008
Advisor: Dr. Nicholas A. Welschmeyer
Thesis: Flow cytometric analysis of phytoplankton viability in Elkhorn Slough, California

Research Assistant, Monterey Bay National Marine Sanctuary 2004 – 2006
Supervisor: Dr. Andrew DeVogelaere, Monterey Bay National Marine Sanctuary

Undergraduate Research Assistant, Santa Clara University 2002 – 2003
Advisor: Dr. Elizabeth E. Dahlhoff

Visitor Programs Intern, Seymour Marine Discovery Center, UC Santa Cruz 2003

Visitor Presentations Intern, Monterey Bay Aquarium 2000

TEACHING EXPERIENCE

Fellow, "Pathways to Scientific Teaching" 2017

Volunteer Educator, League of Extraordinary Scientists 2015 - Present

Guest Lecturer, UCSD SIO 123: Microbial Environmental Systems Biology 2016

Instructor, UCSD SIO 291: Scientific Communications 2013

Fellow, UCSD Workshop: The College Classroom 2012

Teaching Assistant, UCSD ESYS 101: Environmental Systems 2010

Instructor, UCSD Academic Connections Summer Course: Microbial Oceanography 2010

Teaching Assistant, Moss Landing Marine Laboratories Various Courses 2006 – 2008

Teaching Assistant, Teacher Enhancement Program (NSF): Marine Biotechnology and Bioinformatics for Teachers 2007 - 2008

Teaching Assistant, Friday Harbor Laboratories: Pelagic Ecosystem Function 2005

SCIENTIFIC PUBLICATIONS

- Tan, M. H., **S. R. Smith**, K. K. Hixson, J. Tan, J. K. McCarthy, A. B. Kustka, A. E. Allen. 2020. The importance of protein phosphorylation for signaling and metabolism in response to diel light cycling and nutrient availability in a marine diatom. *Biology*. **9**: 155.
- Smith, S. R.**, C. L. Dupont, J. K. McCarthy, J. T. Broddrick, M. Oborník, A. Horák, Z. Füssy, J. Cihlár, S. Kleessen, H. Zheng, J. P. McCrow, K. K. Hixson, W. L. Araújo, A. Nunes-Nesi, A. Fernie, Z. Nikoloski, B. O. Palsson, A. E. Allen. 2019. Evolution and regulation of nitrogen flux through compartmentalized metabolic networks in a marine diatom. *Nature Communications*. **10**: 1-14.
- Broddrick, J. T., N. Du, **S. R. Smith**, Y. Tsuji, D. Jallet, M. A. Ware, G. Peers, Y. Matsuda, C. L. Dupont, B. G. Mitchell, B. O. Palsson, A. E. Allen. 2019. Cross-compartment metabolic coupling enables flexible photoprotective mechanisms in the diatom *Phaeodactylum tricorutum*. *New Phytologist*. **222**: 1364-1379.
- McCarthy, J. K., **S. R. Smith**, J. P. McCrow, M. Tan, H. Zheng, K. Beeri, C. Lichtle, R. Roth, U. Goodenough, C. P. Bowler, C. L. Dupont, A. E. Allen. 2017. Nitrate reductase knockout uncouples nitrate transport from nitrate assimilation and drives repartitioning of carbon flux in a model pennate diatom. *The Plant Cell*. **29**: 2047-2070.
- Davis, A. K., R. M. Abbriano, **S. R. Smith**, M. Hildebrand. 2016. Clarification of photorespiratory processes and the role of malic enzyme in diatoms. *Protist*. **168**: 134-153.
- Caron, D. A., H. Alexander, A. E. Allen, J. M. Archibald, E. V. Armbrust, C. Bachy, A. Bharti, C. J. Bell, S. T. Dyhrman, S. Guida, K. B. Heidelberg, J. Z. Kaye, J. Metzner, **S. R. Smith**, A. Z. Worden. 2017. Insights into the evolution, ecology, and physiology of marine protists from transcriptomic analyses. *Nature Reviews Microbiology*. **15**: 6-20.
- Smith, S. R.**, J. T. F. Gillard, A. B. Kustka, J. P. McCrow, J. H. Badger, H. Zheng, C. L. Dupont, T. Obata, A. R. Fernie, A. E. Allen. 2016. Transcriptional orchestration of the global cellular response of a model pennate diatom to diel light cycling under Fe limitation. *PLOS Genetics*. **12**: e1006490.
- Traller, J. C., S. J. Cokus, D. A. Lopez, O. Gaidarenko, **S. R. Smith**, J. P. McCrow, S. D. Gallaher, S. Podell, M. Thompson, O. Cook, M. Morselli, A. Jaroszewicz, E. E. Allen, A. E. Allen, S. S. Merchant, M. Pellegrini, M. Hildebrand. 2016. Genome and methylome of the oleaginous diatom *Cyclotella cryptica* reveal genetic flexibility toward a high lipid phenotype. *Biotechnology for Biofuels*. **9**: 258.
- Smith, S. R.**, C. G. Glé, R. M. Abbriano, J. C. Traller., A. K. Davis, O. C. Cook, E. M. Trentacoste, M. Vernet, A. E. Allen, and M. Hildebrand. 2016. Transcript level coordination of carbon pathways during silicon-starvation induced lipid accumulation in the diatom *Thalassiosira pseudonana*. *New Phytologist*. **12**: e1006490.
- Hildebrand, M. H., A. Davis, R. Abbriano, H. R. Pugsley, J. C. Traller, **S. R. Smith**, R. P. Shrestha, O. Cook, E. Sánchez-Alvarez, K. Manandhar-Shrestha, and B. Alderete. 2015. Applications of imaging flow cytometry for microalgae. In: Barteneva, S. N., Vorobjev, I. A., eds. *Imaging Flow Cytometry: Methods and Protocols*. New York, USA: Springer, 47-67.
- Keeling, P. J., F. Burki, H. M. Wilcox, B. Allam, E. E. Allen, L. A. Amaral-Zettler, E. V. Armbrust, J. M. Archibald, A. K. Bharti, C. J. Bell, et al. incl. **S. R. Smith**. 2014. The Marine Microbial Eukaryote Transcriptome Sequencing Project (MMETSP): Illuminating the functional diversity of eukaryotic life in the oceans through transcriptome sequencing. *PLOS Biology*. **12**: e1001889.
- Trentacoste, E. M., R. P. Shrestha, **S. R. Smith**, C. Glé, A. C. Hartmann, M. Hildebrand, and W. H. Gerwick. 2013. Metabolic engineering of lipid catabolism increases microalgal lipid accumulation without compromising growth. *Proceedings of the National Academy of Sciences*. **110**: 19748-19753.

- Hildebrand, M., R. M. Abbriano, J. E. W. Polle, J. C. Traller, E. M. Trentacoste, **S. R. Smith**, and A. K Davis. 2013. Metabolic and cellular organization in evolutionarily diverse microalgae as related to biofuels production. *Current Opinion in Chemical Biology*. **17**: 1-9.
- Smith, S. R.**, R. M. Abbriano, M. Hildebrand. 2012. Comparative analysis of diatom genomes reveals substantial differences in the organization of carbon partitioning pathways. *Algal Research*. **1**: 2-16.
- Hildebrand, M., A. K. Davis, **S. R. Smith**, J. C. Traller, and R. Abbriano. 2012. The place of diatoms in the biofuels industry. *Biofuels*. **3**: 221-240.

FELLOWSHIPS, AWARDS, AND HONORS

Western Photosynthesis Conference Invited Speaker	2018
Photosynthesis Gordon Research Conference Invited Speaker	2017
Moore Foundation Early Career Ocean Summit Invited Participant	2017
EMBO Aquatic Microeukaryotes Summit Invited Participant	2016
Early Career Award, Molecular Life of Diatoms Conference, Seattle	2015
Department of Defense National Defense Science and Engineering (NDSEG) Fellowship	2010 – 2013
Scripps Institution of Oceanography Claude E. ZoBell Fellowship	2011 – 2012
Moss Landing Marine Laboratories John H. Martin Scholarship	2008
Myers Oceanographic and Marine Biology Trust Award	2007
Sigma Xi Member	2003

LEADERSHIP/SERVICE

Review Editor, <i>Frontiers in Plant Science</i>	2019 – Present
Reviewer, <i>mSystems</i>	2020
Reviewer, <i>Algal Research</i>	2017, 2020
Reviewer, <i>Genome Biology</i>	2019
Reviewer, <i>Scientific Reports</i>	2019
Reviewer, <i>Microbial Ecology</i>	2017
Project Reviewer, DOE Bioenergy Technologies Office Project Peer Review	2017
Reviewer, <i>Philosophical Transactions of the Royal Society B</i>	2017
Committee Member, Educational Policy Committee, Scripps Institution of Oceanography	2013 – 2014
Founder, Student Genomics Group, Scripps Institution of Oceanography	2012 – 2014
Scripps Community Outreach Program for Education (SCOPE) Volunteer	2009 – 2014
Marine Biology Curricular Group Student Representative, Scripps Institution of Oceanography	2010 – 2011
National Ocean Sciences Bowl Volunteer	2009 – 2010
Committee Member, Student Dean's Advisory Board, San José State University College of Science	2007 – 2008
Docent, Moss Landing Marine Laboratories	2005 – 2008

SELECTED ORAL PRESENTATIONS

- Smith, S.R.**, A. E. Allen. 17 July 2019. Evolution and regulation of nitrogen flux through compartmentalized metabolic networks in a marine diatom. *Molecular Life of Diatoms Conference*. Norwich, UK
- Smith, S. R.** Iron limited photosynthesis and carbon metabolism over diel cycles in *Phaeodactylum tricorutum*. 20 July 2017. *Invited*. *Photosynthesis Gordon Research Conference*, Newry, ME, USA.

- Smith, S. R.** Diatom survival at low iron: What happens in the dark. 30 September 2016. *Invited*. Marine Biology Seminar Series, Scripps Institution of Oceanography, University of California, San Diego, La Jolla, CA, USA.
- Smith, S. R.,** M. Tan, M. Moosburner, J. Gillard, J. McCrow, A. E. Allen. Algal genomics and product potential. 10 March 2016. *Invited*. Food and Fuel for the 21st Century Symposium. University of California, San Diego, La Jolla, CA, USA.
- Smith, S. R.,** J. McCrow, J. Traller, M. Hildebrand, A. E. Allen. Evolutionary significance of genome organization in diatoms. 26 – 29 January 2016. EMBO/EMBL Symposium. A New Age of Discovery for Aquatic Microeukaryotes. Heidelberg, Germany.
- Smith, S. R.,** Evolutionary and functional significance of genome organization in diatoms. Molecular Life of Diatoms Conference. 8 July 2015. Seattle, WA, USA.
- Smith, S. R.,** A. E. Allen. Manipulating metabolism within diatom gene regulatory networks. 8 – 11 June 2015. The 5th International Conference on Algal Biomass, Biofuels, and Bioproducts. San Diego, CA, USA.
- Smith, S. R.** Gene regulatory networks for next-generation strain improvement. 12 March 2015. Food and Fuel for the 21st Century Symposium. University of California, San Diego, La Jolla, CA, USA.
- Smith S. R.** Characterizing regulation of algal carbon and energy metabolism for targeted metabolic engineering. 8 November 2013. *Invited*. Sapphire Energy, La Jolla, CA, USA.
- Smith, S. R.,** C. Glé, A. E. Allen, M. Hildebrand. Global regulation of carbon and energy metabolism in *Thalassiosira pseudonana*. 30 September – 3 October 2013. Algae Biomass Summit. Orlando, FL, USA.
- Smith, S. R.,** A. E. Allen, and M. Hildebrand. A global regulatory mechanism integrates carbon and energy metabolism in the diatom *Thalassiosira pseudonana*. 16-19 June 2013. The 3rd International Conference on Algal Biomass, Biofuels, and Bioproducts. Toronto, Canada.
- Smith, S. R.,** J. C. Traller, A. K. Davis, R. M. Abbriano, S. Federowicz, T. M. Norden-Krichmar, C. Glé, E. Trentacoste, A. E. Allen, and M. Hildebrand. Whole transcriptome analysis of the diatom *Thalassiosira pseudonana* reveals key aspects of carbon flux regulation for improved lipid productivity. 25-27 October 2011. Algae Biomass Summit. Minneapolis, MN, USA.