

Gregory L. Rorrer

Professor

School of Chemical, Biological, and Environmental Engineering
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EDUCATION

Ph.D. Chemical Engineering, Michigan State University, East Lansing, 1989
M.S. Chemical Engineering, Michigan State University, East Lansing, 1985
B.S. Chemical Engineering, University of Michigan, Ann Arbor, 1983

ACADEMIC POSITIONS

Fulbright Visiting Professor, University of Applied Sciences Austria, Sept. 2022 - March 2023
Professor, School of Chemical, Biological, and Environmental Engineering (CBEE), Oregon State University, September 2005-present
Professor & Head, School of CBEE, Oregon State University, Sept. 2011- Feb. 2014
Associate Professor, Oregon State University, 1995-2005
Assistant Professor, Oregon State University, 1989-1995

NON-ACADEMIC POSITIONS

Program Director, National Science Foundation (NSF), Division of Chemical, Bioengineering, Environmental, and Transport Systems, Energy for Sustainability Program, 2009-2011; 2014-2016
Visiting Scientist, Renewable Bioproducts Institute (formally IPST), Georgia Tech, Atlanta GA 1999
Visiting Scientist, Phycogen, Nahant MA 1998-99
Research Engineer, General Motors Research Laboratories, Warren, MI 1985

AWARDS

Alfred H. White Memorial Scholarship, College of Engineering, University of Michigan, 1981-1983
Graduate Fellowship Supplement, 3M and Union Carbide Corporations, 1985-1989
Outstanding Graduate Student Award, College of Engineering, Michigan State University, 1988
Lloyd Carter Award for Outstanding and Inspirational Teaching, College of Engineering, Oregon State University, 1993
Research (Superior Paper) Award, Aquacultural Engineering Society, 2006
Research Award, College of Engineering, Oregon State University, 2006
James & Shirley Kuse Chair in Chemical Engineering, 2012-2014
U.S. State Department Fulbright Scholar, University of Applied Sciences, Austria, 2022-2023

PUBLICATIONS

Textbooks (G.L. Rorrer as co-author)

Welty, J.R., Wilson, R.E., Wicks, C.E., Rorrer, G.L. *Fundamentals of Momentum, Heat and Mass Transfer* (4th Edition), John Wiley & Sons (2000).
Welty, J.R., Wilson, R.E., Wicks, C.E., Rorrer, G.L. *Fundamentals of Momentum, Heat and Mass Transfer* (5th Edition), John Wiley & Sons (2008).
Welty, J.R., Foster, D.G., Rorrer, G.L. *Fundamentals of Momentum, Heat and Mass Transfer* (6th Edition), John Wiley & Sons (2015).
Welty, J.R., Foster, D.G., Rorrer, G.L. *Fundamentals of Momentum, Heat and Mass Transfer* (7th Edition), John Wiley & Sons (2019).

Peer-Reviewed Publications (reverse chronological order)

109. Rorrer*, G.L., Krail, J., Piringer, Roither, M. “Integration of broader impacts and international perspectives into a sustainable energy engineering course.” *Education for Chemical Engineers*, 45, 52-60 (2023). 10.1016/j.ece.2023.07.005.
108. Gale, D.K., and Rorrer, G.L.* “Enhanced Photoluminescence Detection of Immunocomplex Formation by Antibody-Functionalized, Ge-Doped Biosilica from the Diatom *Cyclotella* sp.” *Nanomaterials*, 13, 1950 (2023). 10.3390/nano13131950
107. Kraai, J.A., and Rorrer, G.L.* “High density cultivation and CO₂ uptake by panel arrays of the macrophytic red alga *Gracilaria vermiculophylla* in a 100 L raceway pond.” *Algal Research*, 65, 102726 (2022). 10.1016/j.algal.2022.102726.
106. Evans, S., Rorrer, G.L.*, Langdon, C.J. “Cultivation of the macrophytic red alga *Palmaria mollis* (Pacific dulse) on vertical arrays of mesh panels in aerated tanks.” *Journal of Applied Phycology* 33, 3915-3926 (2021). 10.1007/s10811-021-02582-1.
105. Kraai, J.A., and Rorrer, G.L. “Immobilized cultivation of the red macroalga *Ochtodes secundiramea* via fluid injection of clonal shoot tissues onto porous mesh panels.” *Algal Research*, 55, 102287 (2021). 10.1016/j.algal.2021.102287.
104. Kraai, J.A., and Rorrer, G.L.* “Immobilization and growth of clonal tissue fragments from the macrophytic red alga *Gracilaria vermiculophylla* on porous mesh panels.” *Journal of Applied Phycology* 33, 2407–2414 (2021), 10.1007/s10811-021-02436-w.
103. Ramanan, S., and Rorrer, G.L.* “Limits to biomass productivity during fed-batch cultivation of *Laminaria saccharina* female gametophyte cells in a stirred-tank photobioreactor.” *Journal of Applied Phycology*, 33, 1011–1019 (2021).
102. Squire, K.J., Sivashanmugan, K., Zhang, B., Kraai, J., Rorrer, G.L., and Wang, A.X. “Multiscale Photonic Crystal Enhanced Core–Shell Plasmonic Nanomaterial for Rapid Vapor-Phase Detection of Explosives.” *ACS Applied Nano Materials*, 3, 1656-1665 (2020). 10.1021/acsnm.9b02399.
101. Kraai, J.A., Wang, A.X., Rorrer, G.L.* “Photonic crystal enhanced SERS detection of analytes separated by ultrathin layer chromatography using a diatom frustule monolayer.” *Advanced Materials Interfaces*, 7, 2000191 (2020). 10.1002/admi.202000191.
100. Jarrett, H., Wade, M., Kraai, J., Rorrer, G.L., Wang, A.X., Tan, H. “Self-powered microfluidic pump using evaporation from diatom biosilica thin films.” *Microfluidics and Nanofluidics*, 24:36 (2020).
99. Ford, N.R., Xiong, Y., Hecht, K.A., Squire, T.C., Rorrer, G.L., and Roesijadi, G. “Optimizing the Design of Diatom Biosilica-Targeted Fusion Proteins in Biosensor Construction for *Bacillus anthracis* Detection.” *Biology*, 9, 14 (2020).
98. Squire, K.J., Zhao, Y., Tan, A., Sivashanmugan, K., Kraai, J.A., Rorrer, G.L., Wang, A.X. “Photonic crystal-enhanced fluorescence imaging immunoassay for cardiovascular disease biomarker screening with machine learning analysis.” *Sensors & Actuators: B. Chemical*, 290, 118–124 (2019).

97. LeDuff, P., and Rorrer, G.L.* “Soluble germanium addition to silicon-starved cultures of the diatom *Cyclotella* sp. limits β -chitin nanofiber formation.” *Journal of Applied Phycology* **32**, 901-907 (2020).
96. LeDuff, P., and Rorrer, G.L.* “Formation of extracellular β -chitin nanofibers during batch cultivation of marine diatom *Cyclotella* sp. at silicon limitation.” *Journal of Applied Phycology*, **31**, 3479–3490 (2019).
95. Sivashanmugan, K., Squire, K., Kraai, J. A., Tan, A., Zhao, Y., Rorrer, G. L., and Wang, A. X. “Biological Photonic Crystal-Enhanced Plasmonic Mesocapsules: Approaching Single-Molecule Optofluidic-SERS Sensing.” *Advanced Optical Materials*, **7**, 1900415 (2019).
94. Kraai, J.A., Rorrer, G.L.* , Wang, A.X. “Highly-porous diatom biosilica stationary phase for thin-layer chromatography.” *Journal of Chromatography A*, **1591**, 162–170 (2019).
93. Mancera-Andradea, E.I., Parsaeimehra, A., Ruiz-Ruiza, F, Rorrer, G.L., González-Valdeza, J., Iqbala, H.M.N., and Parra-Saldivara, R. “Sorhamnetin encapsulation into biogenic silica from *Cyclotella* sp. using a microfluidic device for drug delivery applications.” *Biocatalysis and Agricultural Biotechnology* **19**, 101175 (2019).
92. Chiriboga, O., and Rorrer, G.L.* “Phosphate addition strategies for enhancing the co-production of lipid and chitin nanofibers during fed-batch cultivation of the diatom *Cyclotella* sp.” *Algal Research*, **38**, 101403 (2019).
91. Rorrer, G.L.* “Biosynthesis and Extrusion of β -Chitin Nanofibers by Diatoms.” In: *Enzymatic Technologies for Marine Polysaccharides*, A. Trincone, Ed., CRC Press Taylor & Francis Publishers, Boca Raton, FL (2019), pp. 129-150.
90. Chiriboga, O.G., LeDuff, P., and Rorrer, G.L.* “Extracellular Chitin Nanofibers from Marine Diatoms.” In: *Encyclopedia of Marine Biotechnology*, S.-K. Kim, Ed., John Wiley & Sons (2020, 10.1002/9781119143802.ch43), pp. 1083-1092.
89. Squire, K., Kong, X., LeDuff, P., Rorrer, G.L., and Wang, A.X. “Photonic crystal enhanced fluorescence immunoassay on diatom biosilica.” *Journal of Biophotonics*, **11**, e201800009 (2018).
88. Polzin, J., and Rorrer, G.L.* “Selective production of the acyclic monoterpene β -myrcene by microplantlet suspension cultures of the macrophytic marine red alga *Ochtodes secundiramea* under nutrient perfusion cultivation with bromide-free medium.” *Algal Research*, **36**, 159-166 (2018).
87. Chiriboga, O., and Rorrer, G.L.* “Effects of nitrogen delivery on chitin nanofiber production during batch cultivation of the diatom *Cyclotella* sp. in a bubble column photobioreactor.” *Journal of Applied Phycology*, **30**, 1575-1581 (2018).
86. Rorrer, G.L.* “Functionalization of Frustules from Diatom Cell Culture for Optoelectronic Properties.” In: *Diatom Nanotechnology, Progress and Emerging Applications. Nanoscience & Nanotechnology Series No. 44*, D. Losic, Ed., Royal Society of Chemistry Press, London, UK (2018), pp. 79-110.
85. Kong, X., Xi, Y., Le Duff, P., Chong, X., Li, E., Ren, F., Rorrer, G.L., and Wang, A.X. “Detecting explosive molecules from nanoliter solution: A new paradigm of SERS sensing on hydrophilic photonic crystal biosilica”. *Biosensors and Bioelectronics*, **88**, 63-70 (2017).

84. Ozkan, A., and Rorrer, G.L.* “Lipid and Chitin Nanofiber Production during Cultivation of the Marine Diatom *Cyclotella* sp. to High Cell Density with Multistage Addition of Silicon and Nitrate.” *Journal of Applied Phycology*, 29, 1811–1818 (2017).
83. Chiriboga, O., and Rorrer, G.L.* “Control of Chitin Nanofiber Production by the Lipid-Producing Diatom *Cyclotella* sp. through Fed-Batch Addition of Dissolved Silicon and Nitrate in a Bubble-Column Photobioreactor.” *Biotechnology Progress*, 33, 407-415 (2017).
82. Ozkan, A., and Rorrer, G.L.* “Effects of Light Intensity on the Selectivity of Lipid and Chitin Nanofiber Production during Photobioreactor Cultivation of the Marine Diatom *Cyclotella* sp.” *Algal Research*, 25, 216–227 (2017).
81. Ozkan, A., and Rorrer, G.L.* “Effects of CO₂ Delivery on the Production of Fatty Acids and Chitin Nanofibers during Photobioreactor Cultivation of the Marine Diatom *Cyclotella* sp.” *Algal Research*, 26, 422-430 (2017).
80. Ford, N.R., Hecht, K.A., Hu, D., Orr, G., Xiong, Y., Squier, T.C., Rorrer, G.L., and Roesijadi, G. “Antigen Binding and Site-Directed Labeling of Biosilica-Immobilized Fusion Proteins Expressed in Diatoms.” *ACS Synthetic Biology*, 5, 193-199 (2016).
79. Kong, X., Squire, K., Li, E., Rorrer, G.L., Tang, S., McKay, C.P., Navarro-Gonzalez, R., and Wang, A.X. “Chemical and Biological Sensing Using Diatom Photonic Crystal Biosilica with In-Situ Growth Plasmonic Nanoparticles.” *IEEE Transactions on NanoBioscience*, 15, 828-834 (2016).
78. Rorrer, G.L.* and Wang, A.X. “Nanostructured diatom frustule immunosensors.” *Frontiers in Nanoscience and Nanotechnology*, 2, 128-130 (2016).
77. Kong, X., Xi, Y., LeDuff, P., Li, E., Liu, Y., Cheng, L.-J., Rorrer, G.L., Tan, H., and Wang, A.X. “Optofluidic sensing from inkjet-printed droplets: the enormous enhancement by evaporation-induced spontaneous flow on photonic crystal biosilica.” *Nanoscale*, 8, 17285-17294 (2016).
76. Rorrer, G.L.* , Torres, J.A., Durst, R., Kelly, C., Gale, D., Maddux, B., and Ozkan, A. “The Potential of a Diatom-Based Photosynthetic Biorefinery for Biofuels and Valued Co-Products.” *Current Biotechnology*, 5, 237-248 (2016).
75. LeDuff, P., Roesijadi, G., and Rorrer, G.L.* “Micro-photoluminescence of single living diatom cells.” *The Journal of Chemical and Biological Luminescence*, 31, 1379-1383 (2016).
74. Zhen, L., Ford, N., Gale, D.K., Roesijadi, G., and Rorrer, G.L.* “Photoluminescence detection of 2,4,6-trinitrotoluene (TNT) binding on diatom frustule biosilica functionalized with an anti-TNT monoclonal antibody fragment.” *Biosensors and Bioelectronics*, 79, 742–748 (2016).
73. Pérez-López P., Jeffryes, C., Agathos, S., Feijoo, G., Rorrer, G., María Teresa Moreira, M.T. “Environmental Life Cycle Optimization of Essential Terpene Oils Produced by the Macroalga *Ochtodes secundiramea*.” *Science of the Total Environment*, 542, 292–305 (2016).
72. Jeffryes, C., Agathos, S., and Rorrer, G. “Biogenic Nanomaterials from Photosynthetic Microorganisms.” *Current Opinion in Biotechnology*, 33, 23-31 (2015).
71. Rorrer, G.L.* “Bioprocess Engineering of Phototrophic Marine Organisms.” In: *Springer Handbook of Marine Biotechnology*, S.-K. Kim, Ed., Springer Publishing, Heidelberg (2015), pp. 257-294.

70. Yang, J., Zhen, L., Ren, F., Campbell, J., Rorrer, G.L., and Wang, A.X. "Ultra-Sensitive Immunoassay Biosensors using Hybrid Plasmonic-Biosilica Nanostructured Materials." *Journal of Biophotonics*, 8, 611-687 (2015).
69. Ren, F., Campbell, J., Rorrer, G.L., and Wang, A.X. "Surface-Enhanced Raman Spectroscopy Sensors from Nanobiosilica with Self-Assembled Plasmonic Nanoparticles." *IEEE Journal of Selected Topics in Quantum Electronics*, 20, 6900806 (2014).
68. Li, H., Jiang, B., Yang, X., Eastman, M., Liu, Y., Wang, L., Campbell, J., Lampert, L., Wang, R.K., Rorrer, G.L., and Jiao, J. "Near-Infrared Selective and Angle-Independent Backscattering from Magnetite Nanoparticle-Decorated Diatom Frustules." *ACS Photonics*, 1 (6), 477-482 (2014).
67. Ren, F., Campbell, J., Wang, X., Rorrer, G.L., and Wang, A.X. "Enhancing Surface Plasmon Resonances of Metallic Nanoparticles by Diatom Biosilica." *Optics Express*, 21, 15308-15013 (2013).
66. Jeffryes, C., Rosenburger, J., and Rorrer, G.L.* "Fed-Batch Cultivation and Bioprocess Modeling of *Cyclotella sp.* for Enhanced Fatty Acid Production by Controlled Silicon Limitation." *Algal Research*, 2, 16-27 (2013).
65. Jeffryes, C., Campbell, J., Li, H., Jiao, J., and Rorrer, G.L.* "The Potential of Diatom Nanobiotechnology for Applications in Solar Cells, Batteries, and Electroluminescent Devices." *Energy & Environmental Science*, 4, 3930-3941 (2011).
64. Gale, D.K., Jeffryes, C., Gutu, T., Jiao, J., Chang, C., and Rorrer, G.L.* "Thermal Annealing Activates Amplified Photoluminescence of Germanium Metabolically Doped in Diatom Biosilica." *Journal of Materials Chemistry*, 21, 10658-10665 (2011). *Selected for Cover Image.*
63. Goodwin, A.K., and Rorrer, G.L.* "Modeling of Supercritical Water Gasification of Xylose to Hydrogen-Rich Gas in a Hastelloy Microchannel Reactor." *Industrial and Engineering Chemistry Research*, 50, 7172-7182 (2011).
62. Goodwin, A.K., and Rorrer, G.L.* "Reaction Rates for Supercritical Water Gasification of Xylose in a Micro-Tubular Reactor." *Chemical Engineering Journal*, 163, 10-21 (2010).
61. Goodwin, A.K., and Rorrer, G.L.* "Conversion of Xylose and Xylose-Phenol Mixtures to Hydrogen-Rich Gas by Supercritical Water in an Isothermal Microtube Flow Reactor." *Energy & Fuels*, 23, 3818-3825 (2009).
60. Christensen, K.M., and Rorrer, G.L.* "Equilibrium Partitioning Behavior of Naphthalene and Phenanthrene with Axenic Microplantlets of the Temperate Green Seaweed *Acrosiphonia coalita*." *Chemosphere*, 76, 1135-1142 (2009).
59. Gutu, T., Gale, D.K., Jeffryes, C., Wang, W., Chang, C.-H., Rorrer, G.L., and Jiao, J. "Electron Microscopy Characterization of Nanocrystalline Cadmium Sulphide Deposited on the Patterned Surface of Diatom Biosilica." *Journal of Nanomaterials*, 2009, Article ID 860536, 7 pages.
58. Wang, W., Gutu, T., Gale, D.K., Jiao, J., Rorrer, G.L., and Chang, C.H. "Self Assembly of Nanostructured Diatom Microshells into Patterned Arrays Assisted by Polyelectrolyte Multilayer Deposition and Inkjet Printing." *JACS Communications*, 131, 4178-4179 (2009).

57. Gale, D.K., Gutu, T., Jiao, J., Chang, C.-H., and Rorrer, G.L.* “Photoluminescence Detection of Biomolecules by Antibody-Functionalized Diatom Biosilica.” *Advanced Functional Materials*, 19, 926-933 (2009). *Selected for Cover Image*.
56. Jeffryes, C., Gutu, T., Jiao, J., and Rorrer, G.L.* “Metabolic Insertion of Nanostructured TiO₂ into the Patterned Biosilica of the Diatom *Pinnularia sp.* by a Two-Stage Bioreactor Cultivation Process.” *ACS Nano*, 2, 2103-2112 (2008).
55. Jeffryes, C., Gutu, T., Jiao, J., and Rorrer, G.L.* “Peptide-Mediated Deposition of Nanostructured TiO₂ into the Periodic Structure of Diatom Biosilica.” *Journal of Materials Research*, 23, 3255-3262 (2008).
54. Lee, D.-H., Wang, W., Gutu, T., Jeffryes, C., Rorrer, G.L., Jiao, J., and Chang, C.-H. “Biogenic Silica Based Zn₂SiO₄:Mn²⁺ and Y₂SiO₅:Eu³⁺ Phosphor Layers Patterned by Inkjet Printing Process.” *Journal of Materials Chemistry*, 18, 3633–3635 (2008).
53. Qin, T., Gutu, T., Jiao, J., Chang, C.-H., and Rorrer, G.L.* “Biological Fabrication of Photoluminescent Nanocomb Structures by Metabolic Incorporation of Germanium into the Biosilica of the Diatom *Nitzschia frustulum*.” *ACS Nano*, 2, 1296-1304 (2008).
52. Jeffryes, C., Solanki, R., Rangineni, D.-H., Wang, W., Chang, C.-H., and Rorrer, G.L.* “Electroluminescence and Photoluminescence from Nanostructured Diatom Frustules Containing Metabolically Inserted Germanium.” *Advanced Materials*, 20, 2633–2637 (2008).
51. Goodwin, A.K., and Rorrer, G.L.* “Conversion of Glucose to Hydrogen-Rich Gas by Supercritical Water in a Microchannel Reactor.” *Industrial & Engineering Chemistry Research*, 47, 4106–4114 (2008).
50. Qin, T., Gutu, T., Jiao, J., Chang, C.-H., and Rorrer, G.L.* “Photoluminescence of Silica Nanostructures from Bioreactor Culture of Marine Diatom *Nitzschia frustulum*.” *Journal of Nanoscience and Nanotechnology*, 8, 2392-2398 (2008).
49. Jeffryes, C., Gutu, T., Jiao, J., and Rorrer, G.L.* “Two-Stage Photobioreactor Process for the Metabolic Insertion of Nanostructured Germanium into the Silica Microstructure of the Diatom *Pinnularia sp.*” *Materials Science and Engineering C: Biomimetic and Supramolecular Systems*, 28, 107-118 (2008).
48. Lee, D.-H., Gutu, T., Jeffryes, C., Rorrer, G.L., Jiao, J., and Chang, C.-H. “Nanofabrication of Green Luminescent Zn₂SiO₄:Mn using Biogenic Silica.” *Electrochemical and Solid-State Letters*, 10(7), K13-K16 (2007).
47. Cruz-Uribe, O., Cheney, D.P., and Rorrer, G.L.* “Comparison of TNT Removal from Seawater by Three Marine Macroalgae.” *Chemosphere*, 67, 1469–1476 (2007).
46. Lotufo, G.R., Lydy, M.J., Cruz-Uribe, O., Cheney, D.P., and Rorrer, G.L. “Bioconcentration, Bioaccumulation, and Biotransformation of Explosives and Related Compounds in Aquatic organisms.” In: *Ecotoxicology of Explosives*, G.I. Sunahara, J.A. Hawari, G.R. Lotufo, R.G. Kuperman, Eds., CRC Press, Boca Raton, FL (2009), pp. 135-155.
45. Cruz-Uribe, O., and Rorrer, G.L.* “Uptake and Transformation of 2,4,6-Trinitrotoluene (TNT) from Seawater by Microplantlet Suspension Cultures of the Marine Red Macroalga *Portieria hornemannii*.” *Biotechnology & Bioengineering*, 93, 401-412 (2006).

44. Rorrer, G.L.*, Chang, C.-H., Jiao, J., Liu, S.-H., Hedberg, A., and Jeffryes, C. "Biosynthesis of Silicon-Germanium Oxide Nanocomposites by the Marine Diatom *Nitzschia frustulum*." *Journal of Nanoscience and Nanotechnology*, 5, 41-49 (2005).
43. Rorrer, G.L.*, and Cheney, D.P. "Bioprocess Engineering of Cell and Tissue Cultures for Marine Seaweeds." *Aquacultural Engineering*, 32, 11-41 (2004).
42. Tramper, J., Battershill, C., Brandenburg, W., Burgess, G., Hill, R., Luiten, E., Müller, W., Osinga, R., Rorrer, G., Tredici, M., Uriz, M., Wright, P., and Wijffels, R. "What to do in Marine Biotechnology?" *Biomolecular Engineering*, 20, 467-471 (2003).
41. Polzin, J.J., and Rorrer, G.L.* "Metabolic Flux Analysis of Halogenated Monoterpene Biosynthesis in Microplantlets of the Macrophytic Red Alga *Ochtodes secundiramea*." *Biomolecular Engineering*, 20, 205-215 (2003).
40. Barahona, L.F., and Rorrer, G.L.* "Isolation of Halogenated Monoterpenes from Bioreactor Cultured Microplantlets of the Macrophytic Red Algae *Ochtodes secundiramea* and *Portieria hornemannii*." *Journal of Natural Products*, 66, 743-751 (2003).
39. Huang, Y.M., and Rorrer, G.L.* "Cultivation of Microplantlets Derived from the Marine Red Alga *Agardhiella subulata* in a Stirred Tank Photobioreactor." *Biotechnology Progress*, 19, 418-427 (2003).
38. Polzin, J.J., and Rorrer, G.L.* "Halogenated Monoterpene Production by Microplantlets of the Marine Red Alga *Ochtodes secundiramea* within an Airlift Photobioreactor under Nutrient Medium Perfusion." *Biotechnology and Bioengineering*, 82, 415-428 (2003).
37. Yantasee, W., and Rorrer, G.L.* "Comparison of Ion Exchange and Donnan Equilibrium Models for the pH-Dependent Adsorption of Sodium and Calcium Ions onto Kraft Wood Pulp Fibers." *Journal of Wood Chemistry and Technology*, 22, 157-185 (2002).
36. Wise, M.L., Rorrer, G.L., Polzin, J.J., and Croteau, R. "Biosynthesis of Marine Natural Products: Isolation and Characterization of a Myrcene Synthase from Cultured Tissues of the Marine Red Alga *Ochtodes secundiramea*." *Archives of Biochemistry and Biophysics*, 400, 125-132 (2002).
35. Huang, Y.M., and Rorrer, G.L.* "Optimal Temperature and Photoperiod for Cultivation of *Agardhiella subulata* Microplantlets in a Bubble-Column Photobioreactor." *Biotechnology & Bioengineering*, 79, 135-144 (2002).
34. Huang, Y.M., and Rorrer, G.L.* "Dynamics of Oxygen Evolution and Biomass Production During Cultivation of *Agardhiella subulata* Microplantlets in a Bubble-Column Photobioreactor under Medium Perfusion." *Biotechnology Progress*, 18, 62-71 (2002).
33. Maliakal, S., Cheney, D.P., and Rorrer, G.L.* "Halogenated Monoterpene Production in Regenerated Plantlet Suspension Cultures of the Macrophytic Red Alga *Ochtodes secundiramea*." *Journal of Phycology*, 37, 1010-1019 (2001).
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31. Rudie, A., Puckett, A., and Rorrer, G.L. "NPE Modeling of a Laboratory Bleach Filtrate Recycle Experiment." In: *Fundamentals and Numerical Modeling of Unit Operations in the Forest*

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- Products Industries*, B.N. Brogdon, S.J. Severtson and C.C. Walker, Eds. *AIChE Symposium Series 324, Vol. 96*, American Institute of Chemical Engineers, New York (2000), pp. 53-65.
30. Rorrer, G.L.* "Cell and Tissue Cultures of Marine Seaweeds." In: *Encyclopedia of Cell Technology*, R.E. Spier, Ed., John Wiley & Sons, Inc. (2000), pp. 1105-1116.
 29. Rorrer, G.L.*, and Mullikin, R.K. "Modeling and Simulation of a Tubular Recycle Photobioreactor for Macroalgal Suspension Cultures." *Chemical Engineering Science*, 54, 3153-3162 (1999).
 28. Rorrer, G.L.*, Mullikin, R.K., Huang, B., Gerwick, W.H., Maliakal, S., and Cheney, D.P. "Production of Bioactive Metabolites by Cell and Tissue Cultures of Marine Macroalgae in Bioreactor Systems." In: *Plant Cell and Tissue Culture for the Production of Food Ingredients*, T.-J. Fu, G. Singh, and W.R. Curtis, Eds., Kluwer Academic / Plenum Publishing, New York (1999), pp. 165-184.
 27. Mullikin, R.K., and Rorrer, G.L.* "A Tubular Recycle Photobioreactor for Macroalgal Suspension Cultures." In: *BioHydrogen*, O.R. Zaborsky, Ed., Plenum Press, New York (1998), pp. 403-414.
 26. Huang, Y.M., Maliakal, S., Cheney, D.P., and Rorrer, G.L.* "Comparison of Development and Photosynthetic Growth for Filament Clump and Regenerated Microplantlet Cultures of *Agardhiella subulata* (Rhodophyta, Gigartinales)." *Journal of Phycology*, 34, 893-901 (1998).
 25. Rorrer, G.L.* "Removal of Heavy Metal Ions from Waste Water." In: *Encyclopedia of Environmental Analysis and Remediation, Vol. 4*, R.A. Meyers, Ed., John Wiley & Sons, Inc. (1998), pp. 2102-2125.
 24. Rorrer, G.L.*, Yoo, H.D., Huang, B., Hayden, C., and Gerwick, W.H. "Production of Hydroxy Fatty Acids by Cell Suspension Cultures of the Marine Brown Alga *Laminaria saccharina*." *Phytochemistry*, 46, 871-877 (1997).
 23. Hsien, T.Y., and Rorrer, G.L.* "Heterogeneous Crosslinking of Chitosan Beads: Kinetics, Modeling, and Influence on Cadmium Ion Adsorption Capacity." *Industrial and Engineering Chemistry Research*, 36, 3631-3638 (1997).
 22. Lourvanij, K., and Rorrer, G.L.* "Reaction Rates for the Partial Dehydration of Glucose to Organic Acids in Molecular Sieve Catalyst Powders." *Journal of Chemical Technology and Biotechnology*, 69, 35-44 (1997).
 21. Rorrer, G.L.* "An Ode to Distillation and other Poetry - A Creative Writing Assignment for Chemical Engineering Undergraduates." *Chemical Engineering Education*, 30, 180-183 (1996).
 20. Zhi, C., and Rorrer, G.L.* "Photolithotrophic Cultivation of *Laminaria saccharina* Gametophyte Cells in a Bubble-Column Bioreactor." *Enzyme and Microbial Technology*, 18, 291-299 (1996).
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3. Li, H. Jeffryes, C., Gutu, T., Jiao, J., Rorrer, G.L. "Peptide-Mediated Deposition of Nanostructured TiO₂ into the Periodic Structure of Diatom Biosilica and its Integration into the Fabrication of a Dye-Sensitized Solar Cell Device." In: Synthesis of Bioinspired Hierarchical Soft and Hybrid Materials, F. Meldrum, S. Yang, N. Kotov, C. Li (Eds.), *Materials Research Society (MRS) Symposium Proceedings*, 1189E, MM02-05.1-8 (2009).
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4. Rorrer, G.L., Gerwick, W.H., Cheney, D.P. "Production of Bioactive Compounds by Cell and Tissue Cultures of Marine Seaweeds in Bioreactor Systems." In: *New Developments in Marine Biotechnology*, Y. Le Gal and H.O. Halvorson (Eds.) Plenum Press, New York, 1998, pp. 65-68.
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Patent Applications

1. Rorrer, G.L., and Chang, C.-H. Method for Making Metal Oxides. 90 Claims. Submitted to U.S. Patent Office on November 11th, 2005, U.S. Provisional Patent Application No. 60/735,350. Revised application filed November 10th, 2006.

PRESENTATIONS

Invited and Peer-Selected Conference & Workshop Presentations

G.L. Rorrer was the speaker on all presentations listed.

75. Kraai, J.A., and Rorrer, G.L. (speaker). "High Density Cultivation and CO₂ Uptake by Panel Arrays of the Macrophytic Red Alga *Gracilaria vermiculophylla* in a Raceway Pond." World Aquaculture Society (WAS) *Aquaculture 2022*, Session on Macroalgae Aquaculture – Supporting and Emerging Industry, March 1, 2022, San Diego, CA.

74. Kraai, J.A., and Rorrer, G.L. (speaker). “Intensified production of the macrophytic red alga *Gracilaria vermiculophylla* on porous mesh panels in a raceway pond.” *Algae Biomass Summit 2021*, Session on Current Progress in Macroalgae Cultivation, October 19, 2021. Virtual.
73. Chiriboga, O., and Rorrer, G.L. (speaker). “Phosphate addition strategies for enhancing the co-production of biofuel lipids and N-acetyl glucosamine nanofibers by the diatom *Cyclotella*.” *Algae Biomass Summit 2019*, Session on Cultivation Strategies for Improved Productivity, September 19, 2019, Orlando, FL.
72. Rorrer, G. (speaker), Wang, A.X., LeDuff, P., Kraai, J. “Nanostructured Diatom Biosilica for Photoluminescence and SERS Enabled Sensing Applications.” *International Conference on Advances in Functional Materials (AFM-19)*, Session on Advances in Biosensors and Biomaterials, July 23, 2019, Washington, DC.
71. Chiriboga, O., and Rorrer, G.L. (speaker). “Phosphate addition strategies for enhancing the co-production of biofuel lipids and N-acetyl glucosamine nanofibers by the diatom *Cyclotella*.” *9th International Conference on Algal Biomass, Biofuels, and Bioproducts*, Session 2A: Metabolic Regulation of Algae for Biofuels & High-Value Products Paper O1.07, June 17th, 2019, Boulder, CO.
70. Rorrer, G.L. (speaker) and Ozkan, A. “Real-Time Assessment of CO₂ Capture and Conversion to Energy-Dense Lipid Molecules & Biopolymer Nanofibers by Diatom Algae.” *American Chemical Society 23rd Annual Green Chemistry and Engineering Conference*, Session: Carbon Dioxide - Closing the Loop on the Ultimate Raw Material, Paper GCE-GSC 141, June 12, 2019, Reston, VA.
69. Rorrer, G.L. (invited speaker) and Chiriboga, O. “Phosphate addition strategies for enhancing the co-production of biofuel lipids and N-acetyl glucosamine nanofibers by the diatom *Cyclotella*.” *41st Symposium on Biotechnology for Fuels & Chemicals*, Session 4: Lipid Production and Processing, Paper 4-1, April 29, 2019, Seattle, WA.
76. Rorrer, G.L. (speaker), Polzin, J.J. “Selective Production of C₁₀ Hydrocarbons by Microplantlets of the Macrophytic Marine Red Alga *Ochtodes secundiramea*.” World Aquaculture Society (WAS) Aquaculture America 2018, Macroalgae Session, February 22, 2018, Las Vegas, NV.
67. Rorrer, G.L. (speaker), Polzin, J.J. “Selective Production of C₁₀ Hydrocarbons by Microplantlets of the Macrophytic Marine Red Alga *Ochtodes secundiramea*.” *The 8th International Conference on Algal Biomass, Biofuels and Bioproducts*, Paper O2.09, Session 3B: Bioproducts from algae, June 11th, 2018, Seattle, WA
66. Rorrer, G.L. (speaker), Torres, J.A., Maddux, B., Chiriboga, O., LeDuff, P., Ozkan, A. “Controlled Biosynthesis and Extrusion of Pure N-Acetyl Glucosamine Nanofibers from Photosynthetic Diatom Algae”. *11th Algae Biomass Summit*, Focus Topic - Beyond Fuels: Opportunities in Agriculture and Chemicals. October 31, 2017, Salt Lake City, UT.
65. Rorrer, G.L. (speaker), Torres, J.A., Maddux, B., Chiriboga, O., Hoke, M., LeDuff, P., Ozkan, A. “Controlled Biosynthesis & Extrusion of N-acetyl Glucosamine Nanofibers from Photosynthetic Diatom Algae.” *American Chemical Society (ACS) 21st Green Chemistry & Engineering Conference*, Session on Sustainable Design of Polymers & Polymer Composites from Xylochemicals, Paper GC&E 28, June 13, 2017, Reston VA.
64. Rorrer, G.L. (invited speaker). “Nanomaterials from Photosynthetic Microorganisms.” *SRC/IBM Workshop on Biological pathways for electronic nanofabrication and materials*, Session 3 - Biological Nanofabrication and Cellular Factories, November 16, 2016, IBM Almaden Research Center, San Jose, CA.

63. Rorrer, G.L. (speaker), Torres, J.A., Durst, Kelly, C., Maddux, B., Xiang, X., Chiriboga, O., LeDuff, P., Ozkan, A. "Bioprocessing Strategies for Engineered Coproduction of Biofuels & Medical Biopolymers from Diatom Microalgae." *2016 Annual Meeting of the American Institute of Chemical Engineers (AIChE)*, Paper 771b, Session 772: Advances in Algal Biorefineries II, November 18, 2016, San Francisco, CA.
62. Rorrer, G.L. (speaker), Torres, J.A., Durst, Kelly, C., Maddux, B., Xiang, X., Chiriboga, O., LeDuff, P., Ozkan, A. "Bioprocessing Strategies for Coproduction of Biofuels and Value-added Biopolymers from Diatom Microalgae". *10th Algae Biomass Summit*, Track 2 – Engineering Analysis & Bioproduct Innovations, October 24, 2016, Phoenix, AZ.
61. Rorrer, G.L. (speaker), Torres, J.A., Durst, Kelly, C., Maddux, B., Xiang, X., Chiriboga, O., LeDuff, P., Ozkan, A. "Bioprocessing Strategies for Enhanced Production of Biofuels and Amine Biopolymers from Diatom Microalgae." *11th International Marine Biotechnology Conference*, Session on Marine Bioenergy and Algal Biofuels, August 31, 2016, Baltimore, MD.
60. Rorrer, G.L. (speaker), Torres, J.A., Durst, Kelly, C., Maddux, B., Xiang, X., Chiriboga, O., LeDuff, P., Ozkan, A. "Strategies for Controlled Biosynthesis of Biofuels and Valued Co-Products from Diatom Microalgae." *The 6th International Conference on Algal Biomass, Biofuels and Bioproducts*, Paper O1.45, Session 8A – Bioproducts from Algae, June 29, 2016, San Diego, CA.
59. Rorrer, G.L. (invited speaker). "Proposal Writing Tutorial." *Fall 2013 National Meeting of the American Institute of Chemical Engineers (AIChE)*, Paper #195a, NSF Workshop 2, Nov. 4, 2013, Minneapolis, MN.
58. Rorrer, G.L. (invited speaker). "Functionalization of Diatom Nanostructures for Device Applications." *OMICS Group 3rd International Conference on Nanotek & Expo*, Track 5: Nanodevices & Nanosensors, Dec. 5, 2012, Philadelphia, PA.
57. Rorrer, G.L. (speaker), Rosenburger, J.A., Jeffryes, C. "Photobioreactor Cultivation Strategies and Mathematical Models for Enhancing Lipid Production from Diatom Cells by Controlled Silicon Limitation." *6th Algae Biomass Summit*, Session on Photobioreactors: Progress, Challenges and Opportunities, Sept. 26, 2012, Denver, CO.
60. Rorrer, G.L. (invited speaker). "Proposal Writing Tutorial." *Fall 2011 National Meeting of the American Institute of Chemical Engineers (AIChE)*, Paper #178a, NSF Workshop 2, Oct. 17, 2011, Minneapolis, MN.
55. Rorrer, G.L. (invited speaker). "Bioreactor Cultivation Strategies for Incorporating Titanium and Germanium Nanostructures into Diatom Biosilica." *The Molecular Life of Diatoms*, Session on Bio- and Nanotechnology II, June 8, 2011, Georgia Institute of Technology, Atlanta, GA.
54. Rorrer, G.L. (invited speaker). "Harnessing the Biomineralization Capacity of Diatom Algae for the Biological Fabrication of Nanopatterned Semiconducting Metal Oxides with Novel Optoelectronic Properties." *Max Planck Institute Symposium on Molecular Bionics - From Biomineralization to Functional Materials*, Oct. 4, 2010, Schloss Ringberg, Germany.
53. Rorrer, G.L. (invited speaker). "Cellular Fabrication of Nanopatterned Metal Oxides for Optoelectronic Device Applications." *Army Research Laboratory (ARL) Workshop on Biodirected Assembly*, May 18, 2010, Keystone, CO.

52. Rorrer, G.L. (*invited speaker*). Biological Fabrication of Nanopatterned Metal Oxide Semiconductors for Optoelectronic Device Applications. *CMOS Emerging Technologies*, September 25, 2009, Vancouver, BC.
51. Jeffryes, C., Gutu, T., Li, H., Jiao, J., Rorrer, G.L. (speaker). "Peptide-Mediated Deposition of Nanostructured TiO₂ into the Periodic Structure of Diatom Biosilica and its Integration into the Fabrication of a Dye-Sensitized Solar Cell Device". *2009 Spring Meeting of the Materials Research Society (MRS)*, Paper MM2.5, Symposium MM: Synthesis of Bio-inspired Hierarchical Soft and Hybrid Materials, April 14, 2009, San Francisco, CA.
50. Rorrer, G.L. (speaker), Jeffryes, C., Gutu, T., Jiao, J. "Peptide-Mediated Deposition of Nanostructured TiO₂ into the Periodic Structure of Diatom Biosilica for Solar Cell Applications." *Fall 2008 National Meeting of the American Institute of Chemical Engineers (AIChE)*, Paper #122c, Session on Templated Assembly of Inorganic Nanomaterials, Nov. 17, 2008, Philadelphia, PA.
49. Rorrer, G.L. (speaker), Jeffryes, C., Chang, C.-H., Lee, D.-H., Gutu, T., Jiao, J., Solanki, R. "Biological Fabrication of Nanostructured Silicon-Germanium Photonic Crystals Possessing Unique Photoluminescent and Electroluminescent Properties." *SPIE Optics+Photonics 2007, Conference 6645, Nanoengineering: Fabrication, Properties, Optics, and Devices IV*, Paper 6645-09, Session 2, Nano-Biotechnology, Aug. 28, 2007, San Diego, CA.
48. Goodwin, A., Rorrer, G.L. (speaker). "Conversion of Glucose to Hydrogen Gas by Supercritical Water in a Microchannel Reactor." *234th National Meeting of the American Chemical Society (ACS)*, Fuel Division, Paper #253, Session on Fuel Processing for Hydrogen Production, Aug. 23, 2007, Boston, MA.
47. Rorrer, G.L. (speaker), Jeffryes, C., Chang, C.-H., Qin, T., Gutu, T., Jiao, J., Solanki, R. "Biological Fabrication of Nanostructured Silicon-Germanium Materials Possessing Unique Photoluminescent and Electroluminescent Properties." *234th National Meeting of the American Chemical Society (ACS)*, BIOT Division, Paper #55, Session on Emerging Technologies in Nanobiotechnology, Aug. 19, 2007, Boston, MA.
46. Rorrer, G.L. (speaker), Jeffryes, C., Qin, T., Gutu, T., Jiao, J., Solanki, R., Chang, C.-H. "Cell Culture Process for the Supramolecular Assembly of Nanostructured Silicon-Germanium Oxide Semiconductor Materials." *NanoBio 2007, Second International Congress of Nanobiotechnology & Nanomedicine*, June 19th, 2007, San Francisco, CA.
45. Rorrer, G.L. (speaker), Chang, C.-H., Jeffryes, C., Qin, T., Jiao, J., Gutu, T. "Biological Fabrication of Metal Oxide Nanostructures Possessing Novel Optoelectronic Properties." *Fall 2006 National Meeting of the American Institute of Chemical Engineers (AIChE)*, Paper #638f, Session on Nanoelectronic Materials, Nov. 17, 2006, San Francisco, CA.
44. Rorrer, G.L. (speaker), Jeffryes, C., Qin, T., Gutu, T., Jiao, J., Chang, C.-H. "Two-Stage Diatom Cell Culture for the Fabrication of Optoelectronic Materials Ordered at the Submicron and Nanoscale." *Society of Biological Engineering (SBE) Second International Conference on Bioengineering and Nanotechnology*, Session on Supramolecular and Self-Assembly, Sept. 5, 2006, Santa Barbara, CA.
43. Rorrer, G.L. (*invited speaker*). "Whole-Cell Biosynthesis of Nanostructured Silicon-Germanium Oxide Photoluminescent Semiconductor Materials Possessing Defined Microstructure." *2006 Gordon Conference on Biomineralization*, Session on Biosilicification Mechanisms, July 31, 2006, Colby-Sawyer College, New London, NH.

42. Rorrer, G.L. (*invited speaker*). “Biological Fabrication of Nanostructured Metal Oxide Optoelectronic Materials.” *France-US Workshop on NanoBio Technologies*, March 2, 2006, Washington, D.C.
41. Rorrer, G.L. (*keynote speaker*), Chang, C.-H., Jeffryes, C., Liu, S.-H., Qin, T., and Jiao, J. “Whole-cell Biosynthesis of Nanostructured Semiconductor Materials by Marine Diatoms.” *7th International Marine Biotechnology Conference (IMBC 2005)*, Session on Biomineralization, June 10, 2005, St. Johns, NL, Canada.
40. Rorrer, G.L. (*invited speaker*), Chang, C.-H., Jeffryes, C., Liu, S.H., Qin, T., and Jiao, J. “Cellular Biosynthesis of Nanostructured Semiconductor Materials.” *229th National Meeting of the American Chemical Society (ACS)*, Division of Industrial & Engineering Chemistry (I&EC), Session on Nanotechnology and the Environment, March 17, 2005, San Diego, CA.
39. Rorrer, G.L. (*invited speaker*), Cruz-Uribe, O, and Cheney, D.P. “Detoxification of Organic Pollutants by Marine Seaweeds.” *2005 Annual Meeting of the American Association for the Advancement of Science (AAAS)*, Symposium on Phytoremediation: New Solutions to Pollution Remediation on Land and in the Sea, Feb. 18, 2005, Washington, DC.
38. Polzin, J., Barahona, L.F., Cheney, D.P., and Rorrer, G.L. (speaker). “Comparison of Halogenated Monoterpene Biosynthesis in *Ochtodes secundiramea* and *Portieria hornemannii*.” *Fall 2004 National Meeting of the American Institute of Chemical Engineers (AIChE)*, Paper #479d, Session on Advances in Agricultural Biotechnology and Plant Cell Culture, Nov. 8, 2004, Austin, TX.
37. Rorrer, G.L. (speaker), Chang, C.-H., Jiao, J., Liu, S.-H., Hedberg, A., and Jeffryes, C. “Biosynthesis of Silicon Germanium Oxide Nanocomposites by Marine Diatoms.” *Fall 2003 National Meeting of the American Institute of Chemical Engineers (AIChE)*, Paper #392a, Session on Biomimetics III, Nov. 21, 2003, San Francisco, CA.
36. Cruz-Uribe, O., and Rorrer, G.L. (speaker). “Biotransformation of TNT in Seawater by Microplantlet Tissue Cultures of the Marine Red Alga *Portieria hornemannii*.” *Fall 2003 National Meeting of the American Institute of Chemical Engineers (AIChE)*, Paper #411e, Session on Advances in Environmental Biotechnology I: Remediation, Nov. 19, 2003, San Francisco, CA.
35. Rorrer, G.L. (*invited speaker*). “Bioprocess Engineering of Cell & Tissue Cultures of Marine Seaweeds.” *2003 Aquacultural Engineering (AE) Issues Forum*, Session on Design of Algae / Abalone Culture Systems, Nov. 4, 2003, Seattle, WA.
34. Rorrer, G.L. (speaker), and Polzin, J.J. “Metabolic Flux Analysis of Halogenated Monoterpene Biosynthesis in Microplantlets of the Red Algae *Ochtodes secundiramea* and *Portieria hornemannii*.” *2003 Annual Meeting of the Phycological Society of America (PSA)*, Session on Applied Phycology / Physiology, June 18, 2003, Gleneden Beach, OR.
33. Polzin, J.J., and Rorrer, G.L. (speaker). “Metabolic Flux Analysis of Halogenated Monoterpene Biosynthesis in Microplantlets of Red Algae.” *225th National Meeting of the American Chemical Society (ACS)*, Division of Biochemical Technology (BIOT), Paper 381, Session on Advances in Plant Biotechnology, March 27, 2003, New Orleans, LA.
32. Rorrer, G.L. (*keynote speaker*). “New Process Biotechnologies for Marine Seaweeds.” *Marine Biotechnology: Basics and Applications*, European Society for Marine Biotechnology, February 26, 2003, Matalascanas, Spain.

31. Rorrer, G.L (speaker), Polzin, J.P., and Cheney, D.P. "Kinetics of Halogenated Monoterpene Production by Microplantlet Suspension Cultures of the Red Alga *Ochtodes secundiramea*." *Fall 2001 National Meeting of the American Institute of Chemical Engineers (AIChE)*, Paper 304d, Session on Advances in Plant Cell Culture, Nov. 5, 2001, Reno, N.V.
30. Rorrer, G.L. (*keynote speaker*). "From Cell Culture to Metabolic Engineering in Photobioreactors: New Process Biotechnologies for Marine Seaweeds." *Marine Microbial Biotechnology Workshop 2001 (MMBW 2001, European Society for Marine Biotechnology)*, Heriot-Watt University, August 18, 2001, Edinburgh, Scotland.
29. Rorrer, G.L. (speaker), Rudie, A., and Frederick, W.J. "Modeling and Simulation of NPE Metal Ion Adsorption and Precipitation in a Single-Stage Drum Washer." *2000 TAPPI International Environmental Conference and Exhibit*, Paper 47-2, Session 47, Closed Mill Issues, May 10, 2000, Denver, CO.
28. Rorrer, G.L. (speaker), Huang, Y.-M., Maliakal, S., and Cheney, D.P. "Cultivation of Cell and Tissue Suspensions of the Macrophytic Red Alga *Agardhiella subulata* in Bubble-Column and Stirred-Tank Photobioreactors." *Marine Bioprocess Engineering First International Symposium*, Session on Cultivation of Marine Organisms I, Nov. 9, 1998, Noordwijkerhout, the Netherlands.
27. Rorrer, G.L. (speaker), and Mullikin, R.K. "Modeling and Simulation of a Tubular Recycle Photobioreactor for Macroalgal Suspension Cultures." *15th International Symposium on Chemical Reaction Engineering (ISCRE-15)*, Paper 17-c, Session on Biochemical Processing, Sept. 16, 1998, Newport Beach, CA.
26. Rorrer, G.L. (*invited speaker*), and Cheney, D.P. "Cell and Tissue Cultures of Marine Macroalgae: Culture Development, Bioreactor Scale-Up, and Production of Bioactive Compounds." *1998 Meeting of the World Aquaculture Society*, Session on Macroalgal Cultivation, Feb. 18, 1998, Las Vegas, NV.
25. Rorrer, G.L (speaker), and Hsien, T.Y. "Heterogeneous Crosslinking of Chitosan Gel Beads: Modeling, Kinetics, and Influence on Cadmium Ion Adsorption Capacity." *1997 Fall National Meeting of the American Institute of Chemical Engineers (AIChE)*, Paper 30a, Session on Synthesis and Characterization of Novel, Selective Ion Exchangers, Nov. 20, 1997, Los Angeles, CA.
24. Rorrer, G.L (speaker), Huang, Y.M., Maliakal, S., and Cheney, D.P. "Development, Characterization, and Bioreactor Cultivation of Novel Cell and Microplantlet Cultures of the Red Alga *Agardhiella subulata*." *Fall 1997 National Meeting of the American Institute of Chemical Engineers (AIChE)*, Paper 222h, Session on Advances in Plant Cell Culture, Nov. 19, 1997, Los Angeles, CA.
23. Rorrer, G.L. (speaker), and Yantasee, W. "Adsorption Isotherms for Divalent Metal Ions on Unbleached Wood Pulp." *1997 TAPPI Minimum Effluent Mills Symposium*, Paper 2-1, Session 2, Fiberline Behavior, Oct. 23, 1997, San Francisco, CA.
22. Rorrer, G.L. (*invited speaker*), Gerwick, W.H., and Cheney, D.P. "Production of Bioactive Compounds by Cell and Tissue Cultures of Marine Seaweeds in Bioreactor Systems." *4th International Marine Biotechnology Conference (IMBC '97)*, Session O2, Natural Products and Processes, Sept. 23, 1997, Sorrento, Italy.
21. Rorrer, G.L. (*invited speaker*), and Mullikin, R.K. "Photobioreactor Design Considerations for Macroalgal Suspension Cultures." *Biohydrogen '97*, Young Investigator Session, June 24, 1997, Kona, HI.

20. Rorrer, G.L. (*invited speaker*), Gerwick, W.H., and Cheney, D.P. "Production of Bioactive Metabolites by Cell and Tissue Cultures of Marine Macroalgae in Bioreactor Systems." *213th National Meeting of the American Chemical Society (ACS)*, Paper AGFD-41, Symposium on Plant Cell and Tissue Culture for Food Ingredient Production, April 14, 1997, San Francisco, CA.
19. Rorrer, G.L. (speaker), Hayden, C., Yoo, H.-D., and Gerwick, W.H. "Stimulation of 15-Lipoxygenase Metabolism in Liquid Suspension Cultures of *Laminaria saccharina*." *1996 Annual Meeting of the Phycological Society of America (PSA)*, Session 5, Applied Phycology, July 16, 1996, Santa Cruz, CA.
18. Rorrer, G.L. (*invited speaker*). "15-Lipoxygenase Metabolism in Liquid Cell Suspension Cultures of the Macrophytic Brown Alga *Laminaria saccharina*." *1996 Gordon Conference on Marine Natural Products*, Feb. 29, 1996, Ventura, CA.
17. Rorrer, G.L. (speaker), and Hsien, T.Y. "Development of Biopolymer Adsorbents for Heavy Metal Ion Separations." *1996 TAPPI Minimum Effluent Mills Symposium*, Paper 8-4, Session 4, Bleach Evaporation, Jan. 23, 1996, Atlanta, GA.
16. Rorrer, G.L. (speaker), Zhi, C., and Polne-Fuller, M. "Cultivation of a Novel Tissue Suspension Derived from the Green Alga *Acrosiphonia coalita* in a 3 L Stirred Tank Bioreactor." *1995 Annual Meeting of the Phycological Society of America (PSA)*, Symposium on Applied Phycology, Aug. 10, 1995, Breckenridge, CO.
15. Rorrer, G.L. (speaker), Zhi, C., Qi, H., Gerwick, W.H. and Polne-Fuller, M. "Photolithotrophic Bioreactor Cultivation of Marine Plant Cells for Production of Lipoxygenase Metabolites." *Fall 1994 National Meeting of the American Institute of Chemical Engineers (AIChE)*, Paper 35a, Session on Plant Cell, Tissue, and Organ Culture: From Cellular Processes to Bioreactors, Nov. 15, 1994, San Francisco, CA.
14. Rorrer, G.L. (speaker), and Hsien, T.Y. "Development of Chemically Modified Biopolymer Beads for Heavy Metal Ion Separations." *1994 Annual Pacific Northwest Pollution Control Association (PNPCA) Meeting*, Session 6, Industrial Waste Minimization, Sept. 20, 1994, Spokane, WA.
13. Rorrer, G.L. (*invited speaker*), Zhi, C., Qi, H., Modrell, J., and Gerwick, W.H. "Bioreactor Seaweed Cell Culture for Production of Biomedicinals." *Fifth International Phycological Congress (IPC-5)*, Symposium 10, Microalgal & Macroalgal Biotechnology, July 1, 1994, Qingdao, PR China.
12. Rorrer, G.L. (speaker), Zhi, C., Qi, H., and Modrell, J. "Bioreactor Studies of *Laminaria saccharina* Cell Suspension Cultures." *Fall 1993 National Meeting of the American Institute of Chemical Engineers (AIChE)*, Paper 110c, Session on Advances in Plant Cell Culture II, Nov. 8, 1993, St. Louis, MO.
11. Rorrer, G.L. (speaker), and Lourvanij, K. "Selective Dehydration of Glucose to Organic Acids in Microporous Pillared Clay Catalysts." *15th Symposium on Biotechnology for Fuels and Chemicals*, Session 1, Thermal, Chemical and Biological Processing, May 11, 1993, Colorado Springs, CO.
10. Rorrer, G.L. (speaker), Qi, H., Modrell, J., Gerwick, W.H. "Development of Cell Cultures from Marine Plants for Production of Eicosanoid Biopharmaceuticals." *205th National Meeting of the American Chemical Society (ACS)*, Symposium on New Developments in Plant Cell Culture, April 1, 1993, Denver, CO.

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9. Rorrer, G.L. (speaker), Qi, H., Modrell, J., and Gerwick, W.H. "Development of Liquid Cell Cultures from Oregon Macroalgae." *73rd Annual Meeting of the Western Society of Naturalists (WSN)*, Symposium on Phycology, Jan. 8, 1993, Otter Rock, OR.
8. Rorrer, G.L. (speaker), J.D. Way, and Hsien, T.Y. "Removal of Heavy Metal Ions from Waste Water Using Porous-Magnetic Chitosan Beads." *Summer 1992 National Meeting of the American Institute of Chemical Engineers (AIChE)*, Paper 80f, Session on Advanced Separation Processes for Waste Water Treatment, Aug. 10, 1992, Minneapolis, MN.
7. Rorrer, G.L. (speaker), Way, J.D., and Hsien, T.Y. "Use of Chitosan Beads to Remove Heavy Metals from Wastewater." *DOE Waste Stream Minimization/Utilization Technology Fair*, April 25, 1991, Vienna, VA.
6. Rorrer, G.L. (speaker), Mohring, W.R., and Hawley, M.C. "Two Milligram-Scale Reactors for Measuring Gravimetric Vapor Sorption and Conversion Kinetics of Non-Catalytic Vapor-Solid Reactions." *Fall 1990 National Meeting of the American Institute of Chemical Engineers (AIChE)*, Paper 126f, Session on Novel Reactor Techniques for Heterogeneous Systems, Nov. 16, 1990, Chicago, IL.
5. Rorrer, G.L. (speaker), and Hawley, M.C. "Solvolysis of a Single Lignocellulose Particle by Anhydrous Hydrogen Fluoride Vapor: Effect of Temperature on HF Adsorption, Glucose Production Rate, and Reversion Kinetics." *12th Symposium on Biotechnology for Fuels and Chemicals*, Session 1, Thermal, Chemical, and Biological Processing, May 7, 1990, Gatlinburg, TN.
4. Rorrer, G.L. (speaker), Mohring, W.R., Hawley, M.C., and Lamport, D.T.A. "A Detailed Kinetic and Heat Transport Model for the Hydrolysis of Lignocellulose by Anhydrous Hydrogen Fluoride Vapor." *10th International Symposium on Chemical Reaction Engineering (ISCRE-10)*, Aug. 29, 1988, Basle, Switzerland.
3. Rorrer, G.L. (speaker), Mohring, W.R., Hawley, M.C., and Lamport, D.T.A. "A Reaction Model for the Solvolysis of Lignocellulose by Anhydrous Hydrogen Fluoride Vapor." *Summer 1987 National Meeting of the American Institute of Chemical Engineers (AIChE)*, Paper 32a, Symposium on Lignocellulosic Reactions II, Aug. 17, 1987, Minneapolis, MN.
2. Rorrer, G.L. (speaker), Hawley, M.C., and Lamport, D.T.A. "Glucose Yields from the Solvolysis of Wood and Pure Cellulose by Anhydrous Hydrogen Fluoride Vapor." *Energy from Biomass and Wastes XI*, Symposium on Alcohol Fuels, March 19, 1987, Orlando, FL.
1. Rorrer, G.L. (speaker), Hawley, M.C., and Lamport, D.T.A. "Reaction Rates for Gas-Phase Hydrogen Fluoride Saccharification of Wood." *190th National Meeting of the American Chemical Society (ACS)*, Symposium on Pretreatment and Hydrolysis of Lignocellulosic Materials, Sept. 12, 1985, Chicago, IL.

Grantees Conference and Program Development Workshops

1. Rorrer, G.L. (*invited speaker*), Cruz-Uribe, O., Cheney, D.P. "Metabolic Engineering of Seaweeds for the Detoxification of TNT-Contaminated Marine Waters." *Joint Interagency Phytoremediation Research Program, Principal Investigators Meeting*. National Science Foundation, Jan. 20, 2004, Washington, DC.
1. Rorrer, G.L. (*invited speaker*). "Uptake and Metabolism of Trinitrotoluene from Seawater by Tissue Cultures of Native and Transgenic Marine Seaweeds." *Annual Technical Review, U.S. Navy Project*

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on *UXO/MC in the Marine Environment*, Feb. 6, 2004, U.S. Army ERDC Environmental Research Laboratory, Vicksburg, MS.

2. Rorrer, G.L. (*invited speaker*). "Marine Biotechnology: Biopharmaceuticals from Cell and Tissue Cultures of Red Algae." *Oregon Sea Grant Program Assessment Team Visit*, May 17, 2005, Oregon State University, Corvallis, OR.
3. Rorrer, G.L. (*invited speaker*), Chang, C.-H., Jaio, J. "Whole-Cell Biosynthesis of Nanostructured Metal Oxide Semiconductors." *2005 Nanoscale Science and Technology Grantee Conference*, National Science Foundation, Dec. 12, 2005, Washington, D.C.
4. Rorrer, G.L. (*invited speaker*), and Kelly, C. "Conversion of Oregon Biomass to Liquid Transportation Fuels." *Western Region Sun Grant Symposium on Biobased Economy in Oregon*, April 16, 2007, Oregon State University, Corvallis, OR.
5. Rorrer, G.L. (*invited speaker*). "Metabolism of Explosive Compounds TNT and RDX by Tissue Cultures of Marine Seaweeds." *Biosensors, Bioprocesses, and Bioinspired Systems Program Review*, U.S. Office of Naval Research, May 21, 2007, Arlington, VA.
6. Rorrer, G.L. (*invited speaker*), Jeffryes, C., Hu, D., Jones, M.E. "Biological Fabrication of Nanostructured TiO₂ Thin Films for Solar Cell Applications." *3rd Annual AFRL-SNNI Conference: Greener Nano 2008*, March 11, 2008, Corvallis, OR.
7. Rorrer, G.L. (*invited speaker*). "Metabolism of Explosive Compounds TNT and RDX by Tissue Cultures of Marine Seaweeds." *Naval Biosciences Program Review, Part 2*, U.S. Office of Naval Research, August 5, 2008, Arlington, VA.
8. Rorrer, G.L. (*invited speaker*), Jeffryes, C., Hu, D., Jones, M.E. "Biological Fabrication of Nanostructured TiO₂ for Dye-Sensitized Solar Cells." *Greener Nano 2009*, March 3, 2009, Eugene, OR.
9. Rorrer, G.L. (*invited speaker*). "Intensified Cultivation of Clonal Red Macroalgae on Panel Arrays." *Western Region Sun Grant Program*, Newport, OR, August 21, 2019.
10. Rorrer, G.L. (*invited speaker*). "Aquaculture 2.0 – Advancing Food Security through Sustainable Process Intensification and Automation". *National Science Foundation (NSF) EFRI FY22 Topic Suggestion to a Panel convened the Office of Emerging Frontiers and Multidisciplinary Activities (EFMA)*, Feb. 17, 2021 (virtual).
11. Rorrer, G.L. (*invited speaker*). "Intensification of land-based red seaweed cultivation for capture of dissolved critical metals." *ARPA-E Valorizing Algal Minerals Working Group*, New Orleans, LA, March 17, 2022.

Conference Poster Presentations (G.L. Rorrer, Presenter)

1. Rorrer, G.L. (presenter), Henderson, K.A., and Ho, C. "Oxygen Mass Transfer and Shear Sensitivity in Stirred Tank Culture of *Nicotiana tabacum* at High Cell Density." *Fall 1993 National Meeting of the American Institute of Chemical Engineers (AIChE)*, Paper 100a2, Area 15c Poster Session, Nov. 8, 1993, St. Louis, MO.
2. Rorrer, G.L. (presenter), and Netrabukkana, R. "Diffusion of Glucose and Glucitol in Molecular Sieving Catalysts." *1995 Fall National Meeting of the American Institute of Chemical Engineers*

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(AIChE), Paper 59n, Poster Session on Experimental Developments in Kinetics, Catalysis, and Reaction Engineering, Nov. 13, 1995, Miami Beach, FL.

3. Rorrer, G.L (presenter), Huang, Y.M. "Photoperiod Growth Model for Microplantlets of the Marine Red Alga *Agardhiella subulata*." *2001 Fall National Meeting of the American Institute of Chemical Engineers (AIChE)*, Paper 300e, Poster Session for Area 15c: Food, Pharmaceutical, and Bioengineering Division. Nov. 6, 2001, Reno, N.V.
4. Cheney, D.P. (co-presenter), Rorrer, G.L. (co-presenter), Bernasconi, P.G., Cruz-Uribe, O., Bruce, N. "Metabolic Engineering of Seaweeds for the Detoxification of TNT in Marine Waters." *Workshop on Tools for Environmental Cleanup: Engineered Plants for Phytoremediation*, Jan. 27, 2003, Seattle, WA.
5. Rorrer, G.L. (presenter), Jeffryes, C., Liu, S-H., Chang, C.-H. "Biosynthesis of Germanium Oxide by Marine Diatoms." *225th National Meeting of the American Chemical Society (ACS)*, Paper 265, Division of Biochemical Technology (BIOT) Poster Session, March 25, 2003, New Orleans, LA.
6. Qin, T., Gutu, T., Lee, D.-H., Jiao, J., Chang, C.-H. (presenter), and Rorrer, G.L. "Effect of Cultivation time on Photoluminescence of *Nitzschia frustulum*." *2007 Spring Meeting of the Materials Research Society*, #T5.27, Symposium T: The Nature of Design-Utilizing Biology's Portfolio, April 11, 2007, San Francisco, CA. *Best Poster Award for Symposium T*.
7. Rorrer, G.L. (presenter), Goodwin, A. "Rapid and Selective Conversion of Glucose to Hydrogen Gas by Supercritical Water within a Microchannel Reactor." *29th Symposium on Biotechnology for Fuels and Chemicals*, #5B-61, Poster Session 5B, April 30, 2007, Denver, CO.
8. Rorrer, G.L. (presenter), LeDuff, P. "Controlled production of extracellular N-acetyl glucoamine nanofibers by diatom algae through fed-batch addition of inorganic substrates." *American Chemical Society 26th Annual Green Chemistry & Engineering Conference*, Green Chemistry & Engineering Poster Session and Product Showcase, June 7, 2022, Reston, VA.

Invited International Teaching Assignments

Instituto Tecnológico Durango (ITD), Durango, Mexico, Department of Chemical Engineering. "Mass Transfer in Emerging Process Technologies." Short Course, May 25-29, 1998.

University of Applied Sciences – Burgenland (Fachhochschule Burgenland) Austria, Department of Energy and Environment. "Emerging Sustainable Energy Systems". Semester course, Sept. 29, 2022 to February 7, 2023.

Invited Seminars (non Conference)

1. Hoechst A.G., Biotechnology Corporate Research/Carbohydrate Chemistry Research Group, Hauptlaboratorium G 830, Frankfurt, West Germany, Sept. 9, 1988.
2. Department of Chemical Engineering, Michigan State University, East Lansing, MI, Nov. 3, 1988.
3. Department of Agricultural Engineering, Oregon State University, Corvallis, OR, Oct. 4, 1989.
4. Department of Chemical Engineering, Washington State University, Pullman, WA, March 23, 1992.
5. AIChE-Oregon Section Meeting, Eugene, OR, May 13, 1992.
6. OSU Center for Gene Research and Biotechnology Annual Retreat, Hatfield Marine Science Center, Newport, OR, Sept. 26, 1992.
7. Western Oregon State College, Division of Natural Sciences, Monmouth, OR, April 27, 1994.
8. Department of Chemical Engineering, University of Idaho, Moscow, ID, Oct. 10, 1996.
9. Department of Biology, Northeastern University, Boston, MA, Oct. 7, 1998.

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10. Marine Science Center, Northeastern University, Nahant, MA, Oct. 21, 1998.
11. Department of Chemical Engineering, Northeastern University, Boston, MA, Nov. 5, 1998.
12. Phytera, Inc., Worcester, MA, Dec. 2, 1998.
13. Institute of Paper Science and Technology, Atlanta, GA, April 23, 1999.
14. Department of Chemical Engineering, Louisiana State University, Baton Rouge, LA, April 7, 2000.
15. U.S. Office of Naval Research (ONR), Biomolecular and Bioscience Technology Division, Arlington, VA, June 5, 2000.
16. Department of Energy Pacific Northwest National Laboratory, Richland, WA, June 21, 2002.
17. Exelixis Plant Sciences, Portland, OR, May 17, 2004.
18. FEI Company, Hillsboro, OR, Oct. 22, 2004.
19. College of Oceanographic & Atmospheric Sciences, Oregon State University, Corvallis, OR, May 12, 2005.
20. Sequim Marine Sciences Laboratory, Department of Energy Pacific Northwest National Laboratory, Jan. 12, 2006.
21. Department of Physics, Portland State University, Portland, OR, Jan. 30, 2006.
22. Department of Physics, Oregon State University, Corvallis, OR, Feb. 1, 2006.
23. Society of Biological Engineers, Student Chapter, Oregon State University, April 11, 2006.
24. Bend Research, Inc., Bend, Oregon, July 7, 2006.
25. Department of Physics, Portland State University, Feb. 6, 2012.
26. Department of Chemical Engineering, Iowa State University, April 5, 2012.
27. Third KU Energy Conference, Opportunities & Investments in Sustainable Energy. Lawrence, KS, April 25, 2013.
28. Department of Civil & Environmental Engineering, University of Virginia, Charlottesville, VA, Nov. 7, 2014.
29. Department of Chemical & Paper Engineering, Western Michigan University, Kalamazoo, MI, March 21, 2016.
30. Bioprocesses and Synthetic Biology Division, Tecnológico de Monterrey, Monterrey, Mexico, May 28th, 2016.
31. Horizon Initiative Symposium, OSU & OHSU Knight Cancer Institute, Corvallis, OR, March 14, 2017.
32. University of Oregon, Symposium on Harnessing Ecology for Biofuels and Bioremediation, Eugene, OR, April 21, 2017.
33. Academy of Lifelong Learning (ALL), Corvallis, OR, April 26, 2018.
34. Western Region Sun Grant Program, Newport, OR, August 21, 2019.
35. Department of Chemical Engineering, CHEME 486 Process Design II Course, University of Washington, Seattle, WA. May 12, 2023.
36. Institute of Advanced Materials for Sustainable Manufacturing, Tecnológico de Monterrey, Monterrey, Mexico, June 6, 2023 (virtual).

News Media & Press Releases

1. OSU Press Release 5-13-92, David Stauth. Toxic Waste Process Shows Promise.
2. *The New York Times*, June 2, 1992, p. B-9. Toxic Cleanup Tool.
3. *KPTV-12*, Portland television station, broadcast June 11, 1992. Story re-broadcast on *Cable News Network (CNN)*, Science & Technology Today.
4. *The Oregonian* (Portland, OR major newspaper circ. 500,000), June 11, 1992 (front page, section E). Old crab shells work wonders on toxic waste.
5. *Chemical Engineering Progress* (major chemical engineering trade journal), September 1992, 24. Chitin gobbles up toxic waste.
6. OSU Press Release 1-26-93, Jen Ellison. Seaweed Cells Could Yield Valuable Drugs.
7. *The Oregon Scientist* (circ. 32,000), Vol. VI, No. 1, Spring 1993, front page. New drugs from seaweed.

8. OSU Press Release 1-14-94, Carmel Finley. Sea Research May Yield Clues to New Medicinal Compounds.
9. *The Oregonian* (Portland, OR major newspaper circ. 500,000), Feb. 16, 1994, p. E-11 with photo. Gathering sufficient quantity for analysis can be a challenge.
10. OSU Press Release 7-28-04, David Stauth. Ancient Life Form May Help Create Newest Technologies. Picked up by United Press International (UPI), Ancient Algae Weaves Electronics Material. *Washington Times* (Washington DC, newspaper), Aug. 2, 2004.
11. OSU Press Release 7-28-04, Gregg Kleiner. OSU, PSU Receive 1.3 Million for ONAMI Research. Printed in *The Business Journal* (Portland), July 28, 2004.
12. *National Public Radio* (NPR), three feature stories for *Pulse of the Planet: Diatoms & Nanotechnology: Think Future, Think Small* (March 24, 2005); *Diatoms & Nanotechnology: Redefining "Man Made"* (March 28, 2005); *Nanotechnology: Shell Game* (March 29, 2005).
13. OSU Press Release 2-18-05, David Stauth. Marine Seaweed Detoxify Organic Pollutants.
14. *Chemical & Engineering News*, Feb. 28, 2005, Louisa Dalton, Vol. 83(9), p. 14 with photo. Seaweeds have an Appetite for TNT.
15. *The Oregonian*, Feb. 23, 2005, p. A-15. Red seaweed detoxifies TNT lurking in ocean.
16. *Scientific American*, Netherlands Edition, May-June, 2005, Aschwin Tenfelde, p. 12 with photo. Zeeweir eet chemicaliën.
17. *National Geographic News*, March 29, 2005, John Roach. Nanotech Gadgets to be Built by Algae?
18. OSU Press Release 11-27-06, Sarah Cain. Fighting Pollution with Seaweeds? Perhaps, Sea Grant Research Indicates. Picked up by Associated Press, 12-4-06, Oregon State researchers use seaweed to reduce chemical pollution (KMTR-TV, NBC affiliate, Eugene; radio broadcast on Oregon Public Broadcasting).
19. KVAL-TV (CBS affiliate, Eugene) news story, Seaweeds Fight Pollution. Aired 12-7-06 at 5 pm and 11 pm newscasts.
20. Materials Science: Diatomic Power. *Nature*, Research Highlights, 453, 1146 (2008).
21. OSU Press Release 4-8-09, David Stauth. Ancient Diatoms Lead to New Technology for Solar Energy.
22. *EETimes*, April 9, 2009, R. Colin Johnson. Diatoms could triple solar cell efficiency.
23. *Science Channel*, Brink, episode 23: Sustainable Technology, broadcast Aug. 3, 2009
24. *National Geographic magazine*, November 2011, NEXT – Algae Solar Cells, p. 32 with photo.
25. OSU Press Release 9-17-12, David Stauth. Ancient Diatoms Could Make Biofuels, Electronics and Health Food.
26. *Portland Tribune*, 12-1-15, Green power from algae, with photos.
27. OSU Press Release 10-17-18, Tiffany Woods. OSU researchers aim to scale up production of nutritious seaweeds.
28. *Burgenländische Volkszeitung* (BVZ, first newspaper for state of Burgenland, Austria). Gregory Rorrer Experte für nachhaltige Energiesysteme. Woche 3 2023, p. 40 with photo.
29. *der Standard* (3rd largest newspaper in Austria) Wie Biotreibstoff dank künstlicher Photosynthese aus Algen und Abfall entstehen kann. March 29, 2023.

GRANTS AND CONTRACTS

Competitive & External Grant Awards

Awards are listed in reverse chronological order according to award date.

1. U.S. Department of Agriculture, USDA-NIFA Special Grants Aquaculture Research. \$300,000. G.L. Rorrer, P.I, S. Chan (OSU Extension), co-P.I. Scalable Strategies to Enhance Sustainable Red Seaweed Aquaculture in Land-Based Cultivation Systems. July 1, 2023-June 30, 2025
2. USDA-ARS, Bigelow Laboratory for Ocean Sciences. \$100,000. G.L. Rorrer, P.I. Rate Processes for Ocean-based Carbon Capture & Deacidification by Marine Seaweeds. Sept. 1, 2022 to Dec. 31, 2023.
3. U.S. Department of Commerce, National Oceanographic and Atmospheric Administration (NOAA) National Sea Grant Program, Ocean, Coastal and Great Lakes National Aquaculture Initiative, \$740,161 (\$1,119,750 total with matching funds). G.L. Rorrer, P.I., C. Langdon (OSU-HMSC), co-P.I. Intensified Aquaculture of Clonal Red Macroalgae on Panels Deployed in Land-Based Raceways and Marine Waters. Sept. 1, 2018 to Aug. 31, 2023.
4. Knight Cancer Institute, OHSU/OSU Cancer Prevention and Control Initiative, \$50,000. G.L. Rorrer, co-P.I. OSU (\$25,000), W. Yantasee, co-P.I. OHSU (\$25,000). Photoluminescence Based Biosensor for Label Free Detection of Cancer Biomarkers. Aug. 1, 2017 to July 31, 2018.
5. U.S. Department of Agriculture (USDA), National Institute of Food and Agriculture (NIFA), \$402,550. A.X. Wang, P.I. (\$240,550), G.L. Rorrer, co-P.I. (\$40,000), Q. Ling, co-P.I. (\$40,000), C. DeWitt, co-P.I. (\$41,000), D. Stone, co-P.I. (\$41,000). Development of Bio-Enabled Nano-Plasmonic Sensing Technology for Rapid Detection of Histamine and Aquaculture Drugs in Seafood. May 1, 2017 to April 30, 2020.
6. Marine Polymer Technologies, Inc., \$163,527. G.L. Rorrer, P.I. Heterotrophic Diatom Cultivation for Enhanced Chitin Production. Dec. 1, 2016 to Dec. 31, 2018.
7. National Science Foundation (NSF), \$2,000,000. G.L. Rorrer, P.I., C. Kelly, A. Torres, B. Maddux, co-PIs. EFRI-PSBR: The Diatom-based Photosynthetic Biorefinery. Aug. 1, 2012 to July 31, 2018.
8. Office of Naval Research (ONR), \$450,000. G.L. Rorrer, P.I. (OSU, \$189,374), G. Roesijadi, P.I. (DOE-PNNL, \$260,626). Maximizing Photonic and Optoelectronic Properties in Genetically-Enhanced Biosilica for Development of Next Generation Sensors. Oct. 1, 2011 to Sept. 30, 2013.
9. Marine Biopolymer Technologies, \$89,754. Enhancement of Dye-Sensitized Solar Cell Performance by Diatom Frustules. June 1, 2011 to May 31, 2012.
10. Air Force Research Laboratory, Safer Nanomaterials & Nanomanufacturing Initiative (AFRL-SNNI), \$130,000. G.L. Rorrer, P.I. (OSU, \$65,000), Jun Jiao, co-PI (PSU, \$65,000). Biological Fabrication of Nanostructured Thin Films for Photovoltaic and Energy Storage Applications. July 1, 2010 to June 30, 2011.
11. U.S. Office of Naval Research (ONR), ONAMI Nanometrology and Nanoelectronics Initiative, \$290,000. G.L. Rorrer, P.I. Chemical Imaging of the Bio-Nano Interface and Thin-Film Nanostructures by Micro-Raman/Photoluminescence Spectroscopy. July 1, 2009 to June 30, 2010.
12. Air Force Research Laboratory, Safer Nanomaterials & Nanomanufacturing Initiative (AFRL-SNNI), \$130,000. G.L. Rorrer, P.I. (OSU \$65,000), Jun Jiao, co-PI (PSU, \$65,000). Biological Fabrication

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- of Photonic Crystal Thin Films for Enhanced Light Capture by Solar Cells. July 1, 2009 to June 30, 2010.
13. Portland General Electric Company, \$25,000. G.L. Rorrer, P.I. Carbon Balance for Capture of Flue Gas Greenhouse Gases by Microalgae. Jan. 1, 2009 to Dec. 31, 2009.
 14. Oregon Built Environment and Sustainable Technologies (BEST) Research Center, \$75,000. Enzyme Technologies for Green Manufacturing. G.L. Rorrer (OSU, \$25,000), C. Kelly (OSU, \$37,500), and G. Murthy (OSU, \$12,500), co-PIs. July 1, 2008 to June 30, 2009.
 15. Air Force Research Laboratory, Safer Nanomaterials & Nanomanufacturing Initiative (AFRL-SNNI), \$110,000. G.L. Rorrer, P.I., M.E. Jones, co-PI. Green Synthesis of Boron-Doped TiO₂ Nanostructured Photocatalysts for Solar Hydrogen Production. July 1, 2008 to June 30, 2009.
 16. U.S. Office of Naval Research (ONR), ONAMI Nanometrology and Nanoelectronics Initiative, \$110,000. G.L. Rorrer, P.I., M.E. Jones, co-PI. Development of Nanopatterned, Antibody Functionalized Surfaces for Selective Detection of Biomolecules through Enhanced Photoluminescence. July 1, 2008 to June 30, 2009.
 17. Air Force Research Laboratory, Safer Nanomaterials & Nanomanufacturing Initiative (AFRL-SNNI), \$100,000. G.L. Rorrer, P.I., M.E. Jones, co-PI. Green Synthesis of Photonic Crystals for Enhancing Solar Energy Conversion. July 1, 2007 to June 30, 2008.
 18. U.S. Army. G.L. Rorrer, P.I. (OSU, \$75,000), Dan Palo, co-PI (DOE-PNNL, \$75,000). Tactical Energy Systems Development: Portable Cooling Based on Microchannel Adsorption Module. March 1, 2007 to Feb. 28, 2008.
 19. Bend Research, Inc., \$240,165. G.L. Rorrer, P.I. Oct. 1, 2006 to Sept. 30, 2009.
 20. U.S. Office of Naval Research, \$122,485. G.L. Rorrer, PI. Metabolism of the Explosive Compounds TNT and RDX by Tissue Cultures of Marine Seaweeds. Jan. 1, 2006 to Dec. 31, 2007.
 21. ATI/Teledyne Wah Chang, \$47,000 (50% co-funding Oregon Metals Initiative). G.L. Rorrer, PI. Development of a Process for Co-Production of Aqueous Ammonia and Calcium Chloride. Oct. 1, 2005 to Sept. 30, 2006.
 22. U.S. Army, \$80,310. G.L. Rorrer, PI. Tactical Energy Systems Development, Task 5.2: Conversion of Soldier Food Waste to Fuel Cell Hydrogen by Supercritical Water in a Microchannel Reactor. July 1, 2005 to March 31, 2007.
 23. NOAA / Oregon Sea Grant Program, \$90,757. G.L. Rorrer, PI. Uptake and Metabolism of Polycyclic Aromatic Hydrocarbons by Tissue Cultures of Marine Seaweeds. Aug. 1, 2005 to July 31, 2007.
 24. USDA, subcontract from Northeastern University, \$27,000. G.L. Rorrer, PI. Removal of PCB and PAH Compounds from Seawater by Marine Seaweeds – A Preliminary Study. March 1, 2005 to September 1, 2005.
 25. National Science Foundation (NSF), \$1,300,000. G.L. Rorrer, PI; C.-H. Chang, co-PI; J. Jiao, co-PI. NIRT: Whole-Cell Biosynthesis of Nanostructured Metal Oxide Semiconductors. Aug. 1, 2004 to July 31, 2008.

Curriculum Vitae for Gregory L. Rorrer

26. U.S. Office of Naval Research (ONR), \$98,862. G.L.Rorrer, PI. Metabolic Engineering of Seaweeds for the Detoxification of TNT-Contaminated Marine Waters. Oct. 1, 2002 to Sept. 30, 2004.
27. National Science Foundation (NSF), \$100,000. G.L. Rorrer, PI; C.-H. Chang, Co-PI. Biosynthesis of Germanium Oxide Nanoparticles. Aug. 1, 2002 to July 31, 2003.
28. National Science Foundation (NSF), \$190,574. G.L. Rorrer, PI. Production of Secondary Metabolites by Suspension Cultures of Red Macroalgae in Bioreactor Systems. Sept. 1, 1998 to Aug. 31, 2002 (includes REU supplement for Summer 2000).
29. National Council for Air and Stream Improvement (NCASI), \$10,541. G.L. Rorrer, PI. Heavy Metal Ion Adsorption on Wood Pulp. March 1, 1997, to Feb. 28, 1998.
30. U.S. Department of Energy, Office of Industrial Technologies, \$265,000. G.L. Rorrer (PI at OSU), W.J. Frederick (PI at IPST). Control of the Accumulation of Non-Process Elements and Organic Compounds in Pulp Mills with Effluent Wash Water Reuse. July 1, 1996 to June 30, 2000.
31. NOAA/National Sea Grant Marine Biotechnology Initiative, \$53,116. G.L. Rorrer, PI; D.P. Cheney, co-PI. Biopharmaceuticals from Cell Cultures of Red Macroalgae. Continuation Award. Aug. 1, 1997 to Oct. 1, 1999.
32. NOAA/National Sea Grant Marine Biotechnology Initiative, \$417,514. G.L. Rorrer, PI; D.P. Cheney and W.H. Gerwick, Co-PIs. Biopharmaceuticals from Cell Cultures of Red Macroalgae. Aug. 1, 1994 to Oct. 31, 1998.
33. NOAA/Oregon Sea Grant Program, \$137,600. G.L. Rorrer, PI; W.H. Gerwick, Co-Investigator. New Bioprocesses for Production of Medicinals from Marine Plant Cell Culture. Aug. 1, 1993 to July 31, 1995.
34. Hewlett-Packard Company Foundation, \$22,500. G.L. Rorrer, PI. Analytical Equipment for the Chemical Engineering Undergraduate Laboratory and Graduate Research. Feb. 11, 1993.
35. Petroleum Research Fund (ACS-PRF Type-G), \$21,000. G.L. Rorrer, PI. Diffusion and Reaction of Glucose in Y-Zeolite Catalysts. Sept. 1, 1991 to August 31, 1993.
36. U.S. Environmental Protection Agency, Exploratory Research Grants Program, \$199,334. G.L. Rorrer, PI; J.D. Way, Co-PI. Removal of Heavy Metals from Groundwater using Magnetic Chitosan Beads. Oct. 1, 1991, to Sept. 31, 1994.
37. NOAA/Oregon Sea Grant Program, \$79,900. G.L. Rorrer, PI, W.H. Gerwick, Co-Investigator. Bioreactor Studies of Marine Plant Cells in Liquid Culture for Production of Valued Natural Products. Aug. 1, 1991 to July 31, 1993.
38. U.S. Department of Energy, Pacific Northwest Laboratory Innovative Concepts Program, \$20,000. G.L. Rorrer and J.D. Way, Co-PIs. Removal of Heavy Metals from Dilute Aqueous Waste Streams using Chemically Modified Chitosan Beads. Dec. 15, 1990 to Dec. 15, 1991.
39. Biofine, Inc. (Framingham, Mass.), \$24,072. G.L. Rorrer, PI. Highly-Selective Conversion of Glucose and Maltose to Levulinic Acid by Y-Zeolite Catalysts. July 15, 1990 to July 14, 1991.
40. Hopton Technologies, Inc. (Albany, Oregon), \$6424. G.L. Rorrer, PI. Synthesis and Characterization of an Ammonium-Titanium-Carbonate Resin in Aqueous Solution. July 15, 1990 to Dec. 15, 1990.

Faculty Development Grants

ARCO Foundation, \$15,500. G.L. Rorrer, PI. Untenured Faculty Grant. Feb. 25, 1991.

OSU Internal Awards for Research

1. OSU-URISC, \$1800. Undergraduate Research, Summer 1997.
2. OSU Research Council, \$4000. G.L. Rorrer, PI. Selective Conversion of Glucose to Propyl Alcohols in Molecular Sieving Hydrogenation Catalysts. Oct. 1, 1993 to Sept. 31, 1994.
3. OSU Research Council, \$4000. G.L. Rorrer, PI. Bioreactor Studies of Plant Cells in Liquid Culture for Production of Valued Natural Products. July 15, 1990 to July 1, 1991.
4. OSU Research Reserves Equipment Fund (RREF), \$15,789.89 (excludes 20% match). G.L. Rorrer, PI. Beckman Z2 Dual Threshold Coulter Counter. Dec. 28, 2005.

Graduate Education Grants as Co-Investigator

1. U.S. Department of Education, \$501,753. Graduate Assistance in Areas of National Need: Hazardous Waste Management. S.L. Woods, PI. G.L. Rorrer, J. Selker, K. Higley, and G. Wheeler, Co-PIs. Sept. 1, 1995 to August 31, 1998.

Course and Curriculum Development Grants

1. Writing Intensive Curriculum (WIC) Program, OSU, \$2500. Stage One Curriculum Development Grant. "Use of WIC Activities to Address ABET 2000 Accreditation Needs within the Chemical Engineering Curriculum." June 1, 2000 to May 30, 2002.
2. Writing Intensive Curriculum (WIC) Program, OSU, \$1500. "Development of Chemical Engineering Laboratory Courses." Feb. 1, 1992 to Jan. 31, 1993.

PROFESSIONAL SERVICE

Conference Leadership

1. Panel Discussion Group Leader, Algal Biotechnology for Fuels and Chemicals, *15th Symposium on Biotechnology for Fuels and Chemicals*, May 13, 1993, Colorado Springs, CO.
2. Co-Chair, Symposium on Toxic Metals Removal from Waste Streams (Session #33), *Summer 1993 National Meeting of the American Institute of Chemical Engineers*, August 17, 1993, Seattle, WA.
3. Chair, Advances in Plant Cell Culture (Session #209), *Fall 1995 National Meeting of the American Institute of Chemical Engineers*, Nov. 16, 1995, Miami Beach, FL.
4. Co-Chair, Advances in Plant Cell & Tissue Culture (Session #222), *Fall 1997 National Meeting of the American Institute of Chemical Engineers*, Nov. 19, 1997, Los Angeles, CA.
5. Co-Chair, Biochemical Processing (Session 17), *15th International Symposium on Chemical Reaction Engineering (ISCRE-15)*, Sept. 16, 1998, Newport Beach, CA.
6. Co-Chair, Advances in Plant Cell Culture (Session #304), *Fall 2001 National Meeting of the American Institute of Chemical Engineers*, Nov. 5, 2001, Reno, NV.
7. Member, Technical Advisory Board; Discussion Leader, Brainstorming Session - Heterotrophic Organisms. *Marine Biotechnology: Basics and Applications*, European Society for Marine Biotechnology, March 1, 2003, Matalascanas, Spain.
8. Program Committee Member, Nano-Biology Applications, *52nd International Conference on Electron, Ion, and Photon Beam Technology & Nanofabrication (EIPBN 2008)*, May 27-30, 2008, Portland, OR.
9. Moderator, Solar Materials Symposium, Panel 3: Solar Materials of Tomorrow, nano/micro technologies, Micro Nano Breakthrough Conference 2009, Sept. 23, 2009, Portland, OR.
10. Co-Chair, Emerging Technologies: Nanobiotechnology, BIOT Division, *239th National Meeting of the American Chemical Society (ACS)*, March 25, 2010, San Francisco, CA.

11. *Program Area Coordinator – Biofuels*. American Chemical Society, BIOT Division, 2010-2012.
12. Co-Chair, Energy – Energy Storage (TuA2T5), *IEEE Nano 2011*, Aug. 16, 2011, Portland, OR.
13. Chair, Track 5: Nanodevices and Nanosensors, *OMICS Group 3rd International Conference on Nanotek & Expo*, Dec. 5, 2012, Philadelphia, PA.
14. Co-Chair, Breakout Session on Red Seaweeds – the Kelp Alternative? *Oregon Sea Grant State of the Coast Conference*, Nov. 5, 2022, Newport, OR.

Editorial Boards

Journal of Nanomaterials, 2010-2014.

Current Biotechnology, 2019-present.

External Peer Review: Journals and Proposals

Manuscript Review (83 journals): ACS Applied Materials & Interfaces, ACS Crystal Growth and Design, ACS Environmental Science & Technology, ACS Journal of Natural Products, ACS Omega, ACS Sustainable Chemistry and Engineering, Acta Mechanica, Adsorption, Advanced Healthcare Materials, Advanced Materials – Interfaces, Advanced Functional Materials, AIChE Symposium Series, AIChE Journal, Algal Research, Applied Biochemistry & Biotechnology, Applied Microbiology & Biotechnology, Applied Sciences (MDPI), Applied Surface Science, Aquacultural Engineering, Biochemical Engineering Journal, Biofuels, Biomaterials, Biomaterials Science, Biomolecular Engineering, Bioresource Technology, Biotechnology Letters, Biotechnology Progress, Biotechnology & Bioengineering, BMC Biophysics, Botanica Marina, Canadian Journal of Chemical Engineering, Carbohydrate Polymers, Carbohydrate Research, Catalysis Communications, Chemical Engineering Education, Chemical Engineering Science, Chemical Engineering Research and Design, Chemosphere, ChemSusChem, Colloids & Surfaces, Energy Conversion and Management, Energy & Environmental Science, Engineering in the Life Sciences, Environmental Science and Pollution Research, International Journal of Hydrogen Energy, JACS Communications, Journal of Applied Phycology, Journal of Biotechnology, Joule, Journal of Catalysis, Journal of Colloid and Interface Science, Journal of Materials Chemistry, Journal of Medicinal Plants Research, Journal of Nanobiotechnology, Journal of Nanomaterials Research, Journal of Nanoscience and Nanotechnology, Journal of Nanoparticle Research, ACS Journal of Agricultural and Food Chemistry, Journal of Optics, Journal of Physical Chemistry, Journal of Pulp and Paper Science, Journal of Physics D: Applied Physics, Journal of Vacuum Science & Technology B, ACS Industrial and Engineering Chemistry Research, Langmuir, Luminescence: The Journal of Biological and Chemical Luminescence, Marine Biotechnology, Marine Drugs, Materials (open access), Materials Science & Engineering C, Nature Communications, Nature Discover Materials, Nature Materials, Nordic Pulp and Paper Research Journal, Optics Express, PLoS-ONE, Process Biochemistry, Phycological Research, Reactive & Functional Polymers, Scientific Reports, Sensing & Biosensing Research, Separation Science & Technology, Synthetic Metals, Water Research.

Ad hoc Proposal Review (18 Government Agencies / Foundations): American Chemical Society Petroleum Research Fund (ACS-PRF), Center for Plant Biotechnology Research (CPBR), DOE Basic Energy Sciences - Division of Materials Science & Engineering, DoD-MURI, DOE-LANL LDRD, DOE-SBIR Program, Icelandic Research Fund, National Corn Growers Association, National Science Foundation, NOAA/California Sea Grant Program, NOAA/Washington Sea Grant Program, NOAA-NMFS Program, USDA-CREES Program, National Research Council Canada/British Council Joint S & T Fund (Biotechnology), Science Foundation Ireland (Biotechnology), Alfred P. Sloan Foundation.

Panel & Site Review

External Panel Review: DOE Workshop on Biological Hydrogen Production Systems, April 26-27, 1998, Alexandria, VA; NSF/SBIR, 1999; NSF Technologies for a Sustainable Environment, 2000; NSF Technologies for a Sustainable Environment, 2001; NSF Nanoscale Interdisciplinary Research Teams,, 2003; NSF Multi-Scale Modeling in Biomedical, Biological, and Behavioral Systems, 2005; NSF BES, 2005; NSF/SBIR, 2007a; NSF/SBIR, 2007b; NSF-CBET, 2008; NSF-CBET, 2009; NSF-CBET, 2011a; NSF-CBET, 2011b; NSF/SRN, 2012; NSF-CBET, 2012a; NSF-CBET, 2012b; NSF-EFRI, 2013; NSF

Curriculum Vitae for Gregory L. Rorrer

CMMI, 2017; NSF-EiR, 2018; NSF-MRI, 2019; NSF AccelNet, 2019; NSF-ERC 2019; NSF-EFRI, 2020a; NSF-EFRI 2020b; NSF AccelNet, 2020; EPA Harmful Algal Blooms, Feb. 25-27, 2020; DOE-BETO BOTTLE, Aug. 8-9, 2020; NSF-AccelNet, 2021; NSF-ERC, 2020; NSF-EiR, 2022.

Site Visit Team Member, NSF Engineering Research Centers (ERC) Program. Site visits to MarBEC ERC, University of Hawaii, Honolulu, HI, Sept. 23-24, 1999; Nov. 30-Dec. 1, 2000.

External Site Review Panel, U.S. DOE Pacific Northwest National Laboratory (PNNL), Sequim Marine Sciences Laboratory, March 21-23, 2012.

External Reviewer, University of California at Davis Chemical Engineering Program, Nov. 21-22, 2019.

Professional Society Memberships (past and present)

American Institute of Chemical Engineers (AIChE), American Chemical Society (ACS), Aquacultural Engineering Society (AES), European Society for Marine Biotechnology (ESMB), Algal Biomass Organization (ABO)

Academic Advisory Boards

University of Michigan, Ann Arbor, Department of Chemical Engineering, 2015-2018

Scientific Advisory Boards, Private Sector

1. Puriponics LCC, Portland, Oregon. 1996 to 2001.
2. Integrin Biosystems, Oban, Scotland, United Kingdom. 2001 to 2008.

Consulting Assignments

1. CalBioMarine Technologies, Carlsbad, CA, 1994 to 2000
2. Puriponics, Inc., Portland, OR, 1996 to 2000
3. Coastal Plantations International / PhycoGen, Portland, ME, June 1997 to December 1998
4. Willamette Egg Farms, Canby, OR, December 2000 to April 2001
5. Marine Polymer Technologies, 2011-present

State of Oregon

Technical Leadership Team, Oregon *BEST* (Built Environment and Sustainable Technologies) Signature Research Center, 2007-2009

UNIVERSITY SERVICE

Undergraduate Advising

Advisor for chemical engineering (CHE) undergraduate students of senior standing, 1990-2001; advisor for 25 undergraduate students (freshman-senior), 2003-2009
CHE undergraduate degree graduation audits, 1991-1998, 2000-2001

School of Chemical, Biological, and Environmental Engineering (CBEE)

Standing Committees (does not include Graduate Student Committees)

Member, CBEE ABET Committee, 2016-present

Chair, CBEE Instructor of Practice Search Committee, 2019-2020

Chair, Chemical Engineering Graduate Program Curriculum & Assessment Committee, 2016-19

Chair, CBEE Graduate Committee, 2004-2009

Member, CHE Graduate Committee, 1993-1997, 2003-2009

Member, CHE Faculty Search Committee, 1993, 2000, 2018, 2020

Member, CHE Promotion & Tenure Committee, 1995-1997

Member, CHE Laboratory Curriculum Committee, 2000

Member, CHE Vision Committee, 2000

Curriculum Vitae for Gregory L. Rorrer

Organizer, Chemical Engineering Seminar, Winter 1992

Organizer, Chemical Engineering Department Beaver Open House, 1991, 1992

College of Engineering (COE)

Committees

Member, COE Faculty Status Committee, 2018-2020

Member, COE Graduate Committee, 2005-2009

Member, COE Research Advisory Committee, 1991-1997

Member, COE Computer Policy Committee, 1991-1994

Member, COE Minority Status Committee, 1995

Bioprocesses Research Thrust Leader, Biological and Environmental Systems Research Cluster, 2003

Leader, Proposal Development Workshop (NSF Success Strategies), Nov. 24, 2016; Dec. 7, 2018

University

Committees

OSU Research Council (Faculty Senate Committee), 2006-2008

Organizing Committee, Sigma Xi Graduate Student Poster Session, April 21, 1993

University Budget Committee, 2012-2013

Panelist, OSU Grant Writing Workshop, Nov. 2, 2017; Oct. 23, 2019; Dec. 4 & 7, 2020

Activities to Support Diversity/Equity/Inclusion, Broader Impacts, Education

Search Advocate training, OSU Office of Equal Opportunity and Access, Nov. 2017

Climate Reality Leader Training (former US Vice President, Al Gore, Founder & Chairman), Los Angeles, CA, August 28-30, 2018

GEM 2019 Cycle Fellowship Application Review Panel, Alexandria, VA, Nov. 15-16, 2018

BASF Sponsored AIChE Center for Chemical Process Safety (CCPS) Faculty Workshop, Wyandotte, MI July 25-28, 2022

National Nanotechnology Coordinated Infrastructure (NNCI), Science Outside the Lab (SOTL), Washington DC, May 31 – June 2, 2023.

Public Outreach (examples)

DaVinci Days, Discover OSU! Engineering Pavilion, Bionanotechnology, Corvallis OR, July 15-16, 2006; July 21-22, 2007, July 19-20, 2008.

Mentor, Oregon Academy of Science and Engineering (ASE), summers 2004, 2005, 2006, 2008

Mentor, SMILE Program Challenge Weekend, April 17, 1993

Institute Professor, High School Engineering Institute, Michigan State University, Summer 1989

THESES & GRADUATE DEGREES

(23 M.S. degrees, 12 Ph.D. degrees, 2 H.B.S. degrees; 2 Ph.D. current, 1 Ph.D. inactive)

Name & Degree	Degree	Formal Thesis Title	Defense Date
Arthur Veremchuk	Ph.D.	Hydrodynamic effects on carbon sequestration by marine macroalgae (working title)	6/15/26
Hamzah Alzanbaki	Ph.D.	New bioproducts from red macroalgae (working title)	6/15/26
Myles Willis	H.B.S.	Fluid Dynamic Analysis of Fluid Flow in a Raceway Tank for Cultivation of Macrophytic Red Algae, <i>Gracilaria Vermiculophylla</i>	6/6/23
Joseph Kraai	Ph.D.	Intensified Cultivation and Carbon Uptake of Red Macroalgal Clonal Shoot Tissues Immobilized on Stationary Porous Mesh Panels	6/10/21
Joseph Kraai	M.S.	Nanostructured, Highly-Porous Diatom Biosilica Stationary Phase for Thin-Layer Chromatography Separation of Polar, Ionic Analytes	10/9/19
Paul LeDuff	Ph.D.	Studies of Chitin Nanofiber Production and Photoluminescent Biosilica with and without Germanium	6/21/19
Jeremy Campbell	Ph.D.	Biologically Fabricated Thin Films for Solar Photovoltaic Applications (inactive)	TBA
Omar Guillermo Chiriboga Novillo	Ph.D.	Nutrient Addition Strategies for the Marine Diatom <i>Cyclotella</i> sp to Control Cell, Lipid, and Chitin Formation	5/18/18
Nathan Harms	H.B.S.	Photoluminescence Detection of 2,4,6-Trinitrotoluene (TNT) Binding on Single Cell Diatom Biosilica	6/2/16
Le Zhen	M.S.	2,4,6-trinitrotoluene Detection using Photoluminescence response of Diatom Biosilica Functionalized with Single-chain Variable Fragment	6/16/14
Debra K. Gale	Ph.D.	Biomolecule Detection by Amplified Photoluminescence of Germanium Doped Diatom Biosilica	7/25/11
Jennifer Rosenburger	M.S.	Two-Stage Photobioreactor Cultivation for Enhancing Lipid Production from Diatom Cells by Controlled Silicon Limitation	7/2/10
Aaron Goodwin	Ph.D.	Conversion of Biomass Constituents to Hydrogen-rich Gas by Supercritical Water in a Microchannel Reactor	8/26/10
Clayton Jeffryes	Ph.D.	Biological Insertion of Germanium and Titanium Oxides into Diatom Biosilica	5/26/09
Kasidid Asumpinpong	M.S.	Development of a Microchannel Device for Adsorption Cooling Application	2/10/09
Tian Qin	M.S.	Photoluminescence Properties Investigation of Germanium-Inserted Biosilica Generated by Bioreactor Culture of the Marine Diatom <i>Nitzschia frustulum</i>	11/25/08
Ryan A. Weber	M.S.	Uptake and Metabolism of the Explosive RDX by the Marine Seaweeds <i>Portieria hornemannii</i> and	6/13/08

Name & Degree	Degree	Formal Thesis Title	Defense Date
		<i>Acrosiphonia coalita</i> , and the Uptake of the Explosive TNT by Algal Extracts of <i>Portieria hornemannii</i>	
Octavio Cruz-Uribe	Ph.D.	The Uptake, Transformation, and Physiological Response of the Marine Red Alga <i>Portieria hornemannii</i> to the Nitroaromatic Explosive 2,4,6-Trinitrotoluene (TNT)	12/18/07
Kristi Christensen	M.S.	Uptake and Metabolism of Polycyclic Aromatic Hydrocarbons by the Marine Alga <i>Acrosiphonia coalita</i>	6/22/07
Thadeous Ivey	M.S.	Evaporation of an Ammonia Chloride Stream to Produce Aqueous Ammonia and 40 wt% Calcium Chloride	3/23/07
Aaron K. Goodwin	M.S.	Conversion of Glucose to Hydrogen Gas by Supercritical Water in a Microchannel Reactor	2/2/07
Jason J Polzin	Ph.D.	Factors Affecting Halogenated Monoterpene Production in Microplantlets Derived from the Red Macroalga <i>Ochtodes secundiramea</i>	4/27/05
Clayton Jeffryes	M.S.	Silicon and Germanium Uptake and Cellular Growth of the Marine Diatom <i>Nitzschia frustulum</i>	7/22/04
Wassana Yantasee	Ph.D.	Kinetic and Equilibrium Analysis of Metal Ion Adsorption onto Bleached and Unbleached Kraft Pulps	5/1/01
Wassana Yantasee	M.S.	Adsorption of Calcium and Nickel Ions on Wood Pulp	3/4/99
Yao-Ming Huang	Ph.D.	Photobioreactor Cultivation of the Cell and Tissue Cultures Derived from the Marine Red Alga <i>Agardhiella subulata</i>	3/21/01
Mary Tucker	M.S.	Enzyme Activity in Cultures of the Marine Algae <i>Laminaria saccharina</i> and <i>Ochtodes secundiramea</i>	3/19/99
Ronald K. Mullikin	M.S.	Cultivation of Suspension Cultures of <i>Laminaria saccharina</i> Gametophytes in Tubular, Planar, and Stirred-Tank Photobioreactors	7/27/98
Sundar Ramanan	M.S.	Biomass Productivity Enhancement of <i>Laminaria saccharina</i> Cultures in Stirred-Tank Bioreactor by Batch and Fed-Batch Nutrient Delivery	12/17/96
Tzu-Yang Hsien	Ph.D.	Removal of Cadmium Ions by Porous Chitosan Beads: Effect of Acylation and Crosslinking on Material Properties and Adsorption Isotherms	4/29/96
Tzu-Yang Hsien	M.S.	Synthesis of Porous, Magnetic Chitosan Beads and Application to Cadmium Ion Adsorption	7/27/92
Khavinet Lourvanij	Ph.D.	Partial Dehydration of Glucose to Oxygenated Hydrocarbons in Molecular Sieving Catalysts	5/8/95
Khavinet Lourvanij	M.S.	Reactions of Glucose in H-Y Zeolite Catalysts	6/26/91
Chunxing Zhi	M.S.	Cultivation of <i>Laminaria saccharina</i> Gametophyte Cell Cultures and <i>Acrosiphonia coalita</i> Tissue Cultures in Bubble-Column Bioreactors	11/30/94

Name & Degree	Degree	Formal Thesis Title	Defense Date
Ratikorn Netrabukkana	M.S.	Diffusion of Glucose and Glucitol in Microporous and Mesoporous Molecular Sieving Catalysts	11/4/94
Hanshi Qi	M.S.	Cultivation of <i>Laminaria saccharina</i> Gametophyte Cell Cultures in a Stirred-Tank Photobioreactor	4/24/94
Chung-Han Ho	M.S.	Shear Sensitivity and Oxygen Mass Transfer Studies during Cultivation of Tobacco Cells in a Stirred-Tank Bioreactor at Impeller Speeds of 100 to 325 rpm	3/29/94
Jason G. Modrell	M.S.	Bioreactor Development and Cell Culture of the Marine Macroalgae <i>Porphyra</i> and <i>Laminaria saccharina</i>	10/10/93
Benjamin J. Quiroz	M.S. (project)	Models for Diffusion and Adsorption of Heavy Metal Ions in Porous Chitosan Beads	8/26/91
Kelley A. Henderson	M.S.	Oxygen Mass Transfer and Shear Sensitivity Studies during Cultivation of <i>Nicotiana tabacum</i> var. Wisconsin 38 in a Stirred Tank Bioreactor	10/3/91

COURSE TEACHING SUMMARY AT OREGON STATE UNIVERSITY, 1989-PRESENT

College of Engineering

Department of Chemical Engineering (1989-2007)

School of Chemical, Biological, and Environmental Engineering (2007-present)

All courses were 100% instruction

Couse Number	Level	Cr.	Title	No. Times Taught
CHE 102	UG	3	Chemical Engineering Problem Solving and Computations	1
CHE/CBEE 212	UG	3	Energy Balances	8
CHE 332	UG	4	Transport Phenomena II (Heat/Mass Transfer)	3
CHE 333	UG	3	Transport Phenomena III (Mass Transfer)	22
CHE 411	UG	4	Mass Transfer Operations	24
CHE 414/CBEE 414 CHE 415	UG	3	Process Engineering Laboratory/ Chemical Engineering Laboratory	10
CHE 520	G	4	Mass Transfer (Graduate)	18
CHE 525	G	3	Chemical Engineering Analysis I	3
CHE 527	G	3	Chemical Engineering Analysis II	2
CHE 542	G	3	Biochemical Reaction Engineering	1

Rev. June 26, 2023