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EDUCATION AND TRAINING

INSTITUTION AND LOCATION	DEGREE	YEAR(s)	FIELD OF STUDY
University of Idaho, Moscow, ID	B.S.	1976	Zoology
Portland State University, Portland,	Ph.D.	1982	Environmental Science-
University of Chicago	Postdoctoral	1982-1985	Molecular Biology

PROFESSIONAL EXPERIENCE

2015-present	Research Professor, School of Sustainable Engineering and the Built Environment	Arizona State University
2010-2014	Research Professor	New Mexico State University
2009-2010	Vice President for Biotechnology	Solix BioSystems, Fort Collins, CO
2007-2008	NMSU Leader, Institute for Advanced Studies, (State-wide technical project development and grant writing coordinator)	NMSU-Los Alamos National Laboratory-UNM-NMTech
2003-2013	Co-Founder & Consultant	The Genetic Testing Laboratories, Las Cruces, NM
1999-2006	Director, Molecular Biology Graduate Program	New Mexico State University
1997-2009	Director, NMSU DNA Sequencing Facility	New Mexico State University
1985-2003	Assistant, Associate and Full Professor, Plant Genetic Engineering Laboratory and Department of Chemistry and Biochemistry	New Mexico State University

PROFESSIONAL ACTIVITIES

- Associate Editor, Algal Research, 2014-2022
- Associate Editor, Frontiers in Plant Science, (Marine and Freshwater Plants Section), 2019-present
- Chief Scientist, DOE-ATP3 Cultivation Network, Arizona State University, 2015-2020
- Editorial Board, Algal Research, 2012-2014.
- Co-leader, Algae Cultivation Team, DOE National Alliance for Advanced Biofuels and Bioproducts (NAABB), ($50M Algal Biofuels Project)
- Principal Investigator, 2016-2019 DOE-Technologies Incubator Award: A Novel Platform for Cellulosic Mixotrophy. A collaboration between Arizona State University, National Renewable Energy Laboratory, Heliae, Inc., New Mexico State University and Colorado State University
- Principal Investigator, 2013-2016 DOE-ABY Award: Realization of Algae Potential. A collaboration between New Mexico State, Washington State and Michigan State

Universities, Algenol Biofuels, Pan Pacific Tech., Los Alamos, Argonne and Pacific Northwest National Laboratories.

- Co-Lead "Bioalgal Energy Project", New Mexico NSF-EPSCoR Grant "Energize New Mexico". (2013-2015).
- Cultivation Science Leader, DOE-Regional Algal Feedstock Testbed Partnership 2013-2015 with University of Arizona, Texas A&M, Pacific Northwest National Laboratory and New Mexico State University
- Director Algal Bioenergy Program at NMSU (2010-2014)
- Vice President for Biotechnology at Solix Biofuels, Fort Collins, CO 2009-2010.
- 40 years research experience in the biochemistry and molecular biology of photosynthetic and agriculturally relevant microorganisms
- Consultant: algae growth, metabolism and biochemistry in open raceway ponds operated at the NMSU Agricultural Science Center (Artesia, NM) from 2007-2009

AREAS OF EXPERTISE

- Nitrogen nutrition in cyanobacteria, algae and higher plants
- Large scale algae cultivation and nutrient logistics at the energy/water/environment nexus
- High-value co-product development from algae: phycocyanin, anti-oxidants, biostimulants
- Wastewater treatment process development for hot arid environments with photosynthetic algae
- Hydrothermal liquefaction with reclamation of sugars, nitrogen and phosphate from algal biomass
- Biochemistry and molecular biology of nutrient exchange between arbuscular mycorrhizal fungi and higher plants

INDUSTRIAL EXPERIENCE

- Founder and Lab Director of the Genetic Testing Laboratories (gtldna.com); 2001-2010.
- Vice President for Biotechnology, Solix BioSystems, 2009-2010. Responsible for diversification of the business/biotechnology plan to include high-value products from microalgae.
- Patent/Invention Disclosures:
  - Lammers, P.J., N. Csakan, W. Park, M. Seger. "Methods of increasing biomass productivity in algae cultures" 12/15/2017 via AzTE/ASU.
  - Dandamudi, K.P.R., S. Deng, P.J. Lammers, M. Seger. Recycle of nitrogen and phosphorus in hydrothermal liquefaction biochar from Galdieria sulphuraria to cultivate microalgae. 11/17/2021 via AzTE/ASU.

PEER REVIEWED PUBLICATIONS: (69 total); h-index = 45; i10-index = 67; 8,566 total citations on Jan. 23, 2024

1. M. Seger, F. Mammadova, M. Villegas-Valencia, B. Bastos de Freitas, C. Chang, I. Isachsen, H. Hemstreet, F. Abualsaud, M. Boring, P.J. Lammers, K.J. Lauersen. (2023) Engineered ketocarotenoid biosynthesis in the polyextremophilic red microalga Cyanidioschyzon merolae 10D. Metabolic Engineering Communications 17, e00226.
2. Dandamudi, K.P., Mathew, M., Selvaratnam, T., Muppaneni, T., Seger, M., Lammers, P.J., S. Deng, "Recycle of Nitrogen and Phosphorus in Hydrothermal Liquefaction Biochar from Galdieria sulphuraria to Cultivate Microalgae" (2021). Resour. Conserv. Recycl., 171, 105644.
3. Somers, M.D., Chen, P., Clippinger, J., Cruce, J.R., Davis, R., Lammers, P.J., Quinn, J.C. (2021). Techno-economic and life-cycle assessment of fuel production from mixotrophic Galdieria sulphuraria microalgae on hydrolysate. Algal Research, 59, 102419.
4. Dandamudi, K. P.; Murdock, T.; Lammers, P. J.; Deng, S.; Fini, E. H. **(2021)**. Production of functionalized carbon from synergistic hydrothermal liquefaction of microalgae and swine manure. Resour. Conserv. Recycl. 170, 105564.
5. Compton, S., Quiroz, D., Greene, J. **Lammers, P.J**., and J. Quinn (**2021)**. Bulk growth model of algal productivity in various outdoor cultivation platforms. *Algal Research* 54, 102224.
6. Pahlavan, F., Rajib, A., Deng, S., **Lammers, P.J**. and E.H. Fini (**2020)** Investigation of balanced feedstocks of lipids and proteins to synthesize highly effective rejuvenators for oxidized asphalt. *Sustainable Chemistry & Engineering* **8**: 7656-7667.
7. Abeysiriwardana-Arachchige, I. S. A.; Chapman, G. W.; Rosalez, R.; Soliz, N.; Cui, Z.; Munasinghe-Arachchige, S. P.; Delanka-Pedige, H. M. K.; Brewer, C. E.; **Lammers, P. J.**; Nirmalakhandan, N. (**2020)**. Mixotrophic algal system for centrate treatment and resource recovery. *Algal Research* **52**: 102087
8. Mozaffari, K., Seger M, Dungan B, Hanson DT, **Lammers PJ**, Holguin FO. (**2019)**. Alterations in photosynthesis and energy reserves in *Galdieria sulphuraria* during corn stover hydrolysate supplementation. *Bioresource Technology Reports* **7**: 100269.
9. Nirmalakhandan, N., Selvaratnam, T., Henkanatte-Gedera, S.M., Tchinda, D., Abeysiriwawrdana-Arachchige, I.S.A., Delanka-Pedige, H.M.K., Munasinghe-Arachchige, S.P., Zhang, Y., Holguin, F.O., **Lammers, P.J**. (**2019).** Algal wastewater treatments: Phototrophic vs. mixotrophic processes. *Algal Research*, **41**(101569).
10. Rossoni, A.W. Price, D.C. Seger, M., Lyska, D, **Lammers**, **P.J.** Bhattacharya, D. & Weber, A.D.P (**2019**). The genomes of polyextremophilic Cyanidiales contain 1% horizontally transferred genes with diverse adaptive functions. *eLife,* e45017
11. Alina Corcoran, Mark Seger, Rongli Niu, Nagamany Nirmalakhandan, **Peter J. Lammers**, F. Omar Holguin, Wiebke J. Boeing. (**2019**). Evidence for induced allelopathy in an isolate of *Coelastrella* following co-culture with *Chlorella sorokiniana*. *Algal Research*, 41, 101535.
12. Seger, Mark., Unc, Adrian, Starkenburg, Shawn R., Holguin, F. Omar and **Peter J. Lammers** (**2019**). Nutrient-driven algal-bacterial dynamics in semi-continuous, pilot-scale T photobioreactor cultivation of *Nannochloropsis salina* CCMP1776 with municipal wastewater nutrients. *Algal Research* **39:** 101457, https://doi.org/10.1016/j.algal.2019.101457
13. Dandamudi, K.P.R, T. Muppaneni, J. S. Markovski, **Lammers, Peter J**, Shuguang Deng, (**2019**) "Hydrothermal liquefaction of green microalga *Kirchneriella* sp. under sub- and super-critical water conditions" *Biomass and Bioenergy* 120: 224–228
14. Henkanatte-Gedera, S. M., Selvaratnam T., Karbakhshravari, M., Myint, M. Nirmalakhandan, N., Van Voorhies W. and **Peter J. Lammers**. **(2018)**. Removal of dissolved organic carbon and nutrients from urban wastewaters by *Galdieria sulphuraria*: Laboratory to field scale demonstration. *Algal*

Research **24:** 450–456.
15. T. Muppaneni, H.K. Reddy, T. Selvaratnam, K. P. Dandamudi, B. Dungan, N. Nirmalakhandan, T. Schaub, F.O. Holguin, W. Voorhies, **Peter J. Lammers**, S. Deng **(2017)** "Hydrothermal liquefaction of *Cyanidioschyzon merolae* and the influence of catalysts on products" *Bioresource Technol* **223:** 91-97.
16. Dandamudi, K. P. R., *et al*. (**2017**). Co-liquefaction of mixed culture microalgal strains under sub-critical water conditions. *Bioresource Technol* 236: 129-137.
17. Lammers, P.J., Huesemann, M. et al. (**2017**) Review of the cultivation program within the National Alliance for Advanced Biofuels and Bioproducts. *Algal Research* 22, 166-186.
18. Reddy, H.R, Muppaneni, T., Ponnusamy, S., Sudasinghe, N., Pegallapati, A., Selvaratnam, T., Seger, M., Dungan, B., Nirmalakhandan, N., Schaub, T., Holguin, F.O. **Lammers, Peter J.**, VanVoorhies, W., and S. Deng (**2016)** Temperature effect on hydrothermal liquefaction of *Nannochloropsis gaditana* and *Chlorella sp. Applied Energy* 165, 943-951.
19. T. Selvaratnam, S. M. Henkanatte-Gedera, T. Muppaneni, N. Nirmalakhandan, S. Deng, **P. J. Lammers** (**2016)**. Maximizing Recovery of Energy and Nutrients from Urban Wastewaters. *Energy* 104: 16-23.
20. Selvaratnam, T., Reddy, H., Mupaneni, T., Holguin, F.O., Nirmalakhandan, N., S. Deng and **P.J. Lammers (2015)** Optimizing Energy Yields from Nutrient Recycling Using Sequential Hydrothermal Liquefaction with *Galdieria sulphuraria*. Algal Research, **12:** 74-79
21. Sudasinghe, N., Reddy, H., Csakan,N., Deng, S., **Lammers, P.J.**, Schaub, T. **(2015)** Temperature-Dependent Lipid Conversion and Non-Lipid Composition of Microalgal Hydrothermal Liquefaction Oils Monitored by Fourier Transform Ion Cyclotron Resonance Mass Spectrometry. *Bioenergy Research* DOI 10.1007/s12155-015-9635-9
22. Henkanatte-Gedera, S.M., T. Selvaratnam, N. Caskan, N. Nirmalakhandan, W. Van Voorhies, **Peter J. Lammers (2015)**. Algal-based, Single-step Treatment of Urban Wastewaters. *Bioresour Technol* **189:** 273-278.
23. Selvaratnam, T., Pegallapati, A.K., Montelya, F., Rodriguez, G., Khandan, N. N., **Lammers, P.J.**, Van Voorhies, W. **(2015)** Feasibility of algal systems for sustainable wastewater treatment. *Renewable Energy* **82:** 71-76.
24. Selvaratnam, T., A.K. Pegallapati, H. Reddy, N. Kanapathipillai, N. Nirmalakhandan, S. Deng, **P.J. Lammers (2015).** Algal biofuels from urban wastewaters: Maximizing biomass yield using nutrients recycled from hydrothermal processing of biomass. *Bioresourc Technol* **182:** 232-238.
25. Archambault, S., Starbuck Downes, C. M., Van Voorhies, W., Erickson, C. A., and **Lammers, P. J. (2014)** *Nannochloropsis sp*. algae for use as biofuel: Analyzing a translog production function using data from multiple sites in the southwestern United States, *Algal Research* **6**, 124-131.
26. Reddy, H.K., Muppaneni, T., Sun, Y., Li, Y., Ponnusamy, S., Prafulla, P.D., Dailey, P., Schaub, T., Holguin, F.O. Dungan, B., Cooke, P., **Lammers, P.J**., VanVoorhies, W., Lu, X., and S. Deng **(2014)** Subcritical water extraction of lipids from wet algae for biodiesel production. *Fuel* **115:** 720-726
27. Selvaratnam, T., Pegallapati, A. K., Montelya, F., Rodriguez, G., Nirmalakhandan, N., Van Voorhies, W., and **Lammers, P. J**. **(2014)** Evaluation of a thermo-tolerant acidophilic alga, *Galdieria sulphuraria*, for nutrient removal from urban wastewaters, *Bioresource Technol* **156**: 395-399.
28. Sudasinghe, N., Dungan, B., **Lammers, P. J.**, Albrecht, K., Elliott, D., Hallen, R., and Schaub, T. **(2014)** High Resolution FT-ICR Mass Spectral Analysis of Bio-oil and Residual Water Soluble Organics Produced by Hydrothermal Liquefaction of the Marine Microalga *Nannochloropsis salina*., *Fuel* **119:** 47-56.
29. Fulbright, S., Dean, M. K., Wardle, G., **Lammers, P. J.**, and Chisholm, S. **(2014)** Molecular diagnostics for monitoring contaminants in algal cultivation, *Algal Research* **4:** 41-51.
30. E. Tisserant, M. Malbreil, A. Kuo, A. Kohler, A. Symeonidi, R. Balestrini, P. Charron, N. Duensing, N. Frei dit Frey, V. Gianinazzi-Pearson, L.B. Gilbert, Y. Handa, J.R. Herr, M. Hijri, R. Koul, M. Kawaguchi, F. Krajinski, **P.J. Lammers**, F.G. Masclaux, C. Murat, E. Morin, S. Ndikumana, M. Pagni, D. Petitpierre, N. Requena, P. Rosikiewicz, R. Riley, K. Saito, H. San Clemente, H. Shapiro,

D. van Tuinen, G. Bécard, P. Bonfante, U. Paszkowski, Y. Shachar-Hill, G.A. Tuskan, P.W. Young, I.R. Sanders, B. Henrissat, S.A. Rensing, I.V. Grigoriev, N. Corradi, C. Roux, and F. Martin. **(2013)** Genome of an arbuscular mycorrhizal fungus provides insight into the oldest plant symbiosis. *Proc. Natl. Acad. Sci USA*. **110:** 20117-20122.

31. Patil, P, Reddy, H., Muppaneni, T., Schaub, T., Holguin, F.O., Cooke, P., **Lammers, P.J.**, Nirmalakhandan, N., Li, Y., Lu, X., Deng, S. (2013) In-Situ Ethyl Ester Production from Wet Algal Biomass under Microwave-Mediated Supercritical Ethanol Conditions. *Bioresource. Technol*. **139:** 308-315.
32. Quinn, J., Yates, T., Douglass, N., Weyer, K., Butler, J., Bradley, T.H. and **P.J. Lammers (2012)**. *Nannochloropsis* Production Metrics in a Scalable Outdoor Photobioreactor for Commercial Applications. *Bioresource Technology* **117:** 164-171.
33. Patil PD, Gude VG, Mannarswamy A, Cooke P, Nirmalakhandan N, **Lammers P**, Deng SG **(2012)** Comparison of direct transesterification of algal biomass under supercritical methanol and microwave irradiation conditions. *Fuel* **97:** 822-831
34. Patil, PD, H Reddy, T Muppaneni, A. Mannarswamy, T Schuab, **PJ Lammers**, N Nirmalakhandan, P Cooke and S Deng. **(2012)** Power Dissipation in Microwave-Enhanced In-Situ Transesterification of Algal Biomass. *Green Chemistry* **14**: 809-817.
35. Tisserant, E., Kohler, A., Dozolme-Seddas, P., Balestrini, R., Benabdellah, K., Colard, A., Croll, D., Da Silva, C., Gomez, S. K., Koul, R., Ferrol, N., Fiorilli, V., Formey, D., Franken, P., Helber, N., Hijri, M., Lanfranco, L., Lindquist, E., Liu, Y., Malbreil, M., Morin, E., Poulain, J., Shapiro, H., van Tuinen, D., Waschke, A., Azcon-Aguilar, C., Becard, G., Bonfante, P., Harrison, M. J., Kuster, H., **Lammers, P.**, Paszkowski, U., Requena, N., Rensing, S. A., Roux, C., Sanders, I. R., Shachar-Hill, Y., Tuskan, G., Young, J. P. W., Gianinazzi-Pearson, V., and Martin, F. **(2012)**. The transcriptome of the arbuscular mycorrhizal fungus *Glomus intraradices* (DAOM 197198) reveals functional tradeoffs in an obligate symbiont. *New Phytologist* **193**(3): 755-769.
36. P.D. Patil, V.G. Gude, A.Mannarswamy, S. Deng, P.Cooke, S. Munson-McGee, I.Rhodes, **P.J.Lammers,** N. Nirmalakhandan, **(2011)**. "Optimization of Direct Conversion of Wet Algae to Biodiesel under Supercritical Methanol Conditions" *Bioresource Technology* **102**: 118–122
37. Tian, C. J., B. Kasiborski, R. Koul, **P. J. Lammers,** H. Bucking and Y. Shachar-Hill. **(2010).** Regulation of the Nitrogen Transfer Pathway in the Arbuscular Mycorrhizal Symbiosis: Gene Characterization and the Coordination of Expression with Nitrogen Flux. *Plant Physiology* **153**(3): 1175-1187
38. Patil, P., S. G. Deng, J. I. Rhodes and **P. J. Lammers. (2010).** Conversion of waste cooking oil to biodiesel using ferric sulfate and supercritical methanol processes. *Fuel* **89**(2): 360-364.
39. Angeles, J. G. C., Z. Ouyang, A. M. Aguirre, **P. J. Lammers** and M. Song **(2009).** "Identification of gene interactions in fungal-plant symbiosis through discrete dynamical system modeling." IET Systems Biology **3**(5): 414-428.
40. Gachomo, E., J. W. Allen, P. E. Pfeffer, M. Govindarajulu, D. D. Douds, H. R. Jin, G. Nagahashi, **P. J. Lammers**, Y. Shachar-Hill and H. Bucking **(2009)**. "Germinating spores of *Glomus intraradices* can use internal and exogenous nitrogen sources for de novo biosynthesis of amino acids." *New Phytologist* **184**(2): 399-411.
41. Croll, D., M. Giovannetti, A.M. Koch, C. Sbrana, M. Ehinger, **P.J. Lammers** & I.R. Sanders. **(2009)**. Non-self vegetative fusion and genetic exchange in the arbuscular mycorrhizal fungus *Glomus intraradices*. *New Phytologist* 181: 924-937.
42. Martin, F., V Gianinazzi-Pearson, M Hijri, **PJ Lammers**, I R Sanders, Y Shachar-Hill, H Shapiro,GA Tuskan and P Young. **(2008)**. The long hard road to a completed *Glomus intraradices* genome. New Phytologist **180(4):** 13-16.
43. Croll, D., L. Wille, H.A. Gamper, N. Mathimaran, **P.J. Lammers**, N. Corradi, I.R. Sanders. **(2008)**. Genetic diversity and host plant preferences revealed by simple sequence repeat and mitochondrial

markers in a population of the arbuscular mycorrhizal fungus *Glomus intraradices.* *New Phytologist,* **178:** 672-687

44. Bücking, H, J. Abubaker, M. Govindarajulu, M. Tala, P.E. Pfeffer,G. Nagahashi, **P.J. Lammers**, Y. Shachar-Hill. **(2008).** Nutrient uptake and metabolism during presymbiotic growth of *Glomus intraradices*.I. The uptake and metabolism of carbon. *New Phytologist* **180:** 684-695
45. Govindarajulu, M., P.E. Pfeffer, H. Jin, J. Abubaker, D.D. Douds, J.W. Allen, H. Bücking, **P.J. Lammers** and Y. Shachar-Hill **(2005)** Nitrogen transfer in the arbuscular mycorrhizal symbiosis. *Nature* **435:** 819-823
46. Jin, H., P.E. Pfeffer, D.D. Dounds, E. Piotrowski, **P.J. Lammers**, and Y. Shachar-Hill **(2005).** Nitrogen assimilation, transport and transfer in an arbuscular mycorrhizal symbiosis. *New Phytologist* **168:** 687–696
47. Torres, S. ,C.R. Fjetland, **P.J. Lammers (2005)** Alkane-induced expression, substrate binding profile, and immunolocalization of a cytochrome P450 encoded on the *nifD* excision element of *Anabaena* 7120 *BMC Microbiology* **5:**16
48. **Lammers, P.J.**; Abubaker, J.; Govindarajulu, M.; Jun, J.; Krijgsman, O.; de Jong, M. **(2004)**. Quantitative analysis of gene expression in the arbuscular mycorrhizal symbiosis. In: Basic Research and Applications of Mycorrhizae. Eds. Podila, G.K. and Varma, A. I.K. International, New Delhi
49. J.B. Spalding[1] and **P.J. Lammers (2004)**. BLAST Filter and GraphAlign: rule-based formation and analysis of sets of related DNA and protein sequences. *Nucleic Acids Research* **32:** W26-W32.
50. Martin, F. , G.A. Tuskan, S.P. DiFazio, **P. Lammers,** G. Newcombe, & G.K. Podila **(2004).** In the Wake of the Poplar Genome Sequence - Whole Genome Sequencing of the Endomycorrhizal *Glomus intraradices* and the Ectomycorrhizal *Laccaria bicolor* for 2004. *New Phytologist* **161:** 330-335.
51. Mori, S., A. Castoreno, M.E. Mulligan, and **P.J. Lammers**. **(2003)**. Nitrogen status modulates the expression of RNA-binding proteins in cyanobacteria. FEMS Microbiology Letters **227:** 203-210.
52. B. Bago, P. E Pfeffer, J. Abubaker, J. Jun, J.W. Allen, J. Brouillette, D.D Douds, **P.J. Lammers**, Y. Shachar-Hill. **(2003)**. Carbon export from arbuscular mycorrhizal roots involves the translocation of carbohydrate as well as lipid. *Plant Physiol*. **131:** 1496-1507
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54. Bago, B. W. Zipfel, R. Williams, J. Jun, R. Arreola, **P. J. Lammers**, P. E Pfeffer, Y. Shachar-Hill **(2002)** Translocation and utilization of fungal storage lipid in the arbuscular mycorrhizal symbiosis. *Plant Physiology* **128:** 108-124
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56. Mori, S, A. Castoreno, and **P.J. Lammers (2002)**. Transcript levels of *rbcR1, ntcA,* and *rbcL/S* genes in the cyanobacterium *Anabaena* sp. PCC 7120 are downregulated in response to cold and osmotic stress. *FEMS Microbiology Letters* **213:** 167-173.
57. **Lammers, P. J**., J. Jun, J. Abubaker, R. Arreola, A. Gopalan, B. Bago, C. Hernandez-Sebastia, J.W. Allen, D.D Douds, P.E Pfeffer, Y. Shachar-Hill. **(2001)**. The glyoxylate cycle in an arbuscular mycorrhizal fungus: gene expression and carbon flow. *Plant Physiology*, **127:** 1287-1298
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61. Spence, M.J., M.T. Henzl, and **P.J. Lammers (1991)**. The structure of a *Phaseolus vulgaris* cDNA encoding the iron storage protein ferritin. *Plant Mol. Biol*. **17:** 499-504.

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63. Hapak, R.C., **P.J. Lammers**, W.A.Palmisano, E.R.Birnbaum, and M.T.Henzl **(1989)**. Site-specific substitution of glutamate for aspartate at position 59 of rat oncomodulin. *J. Biol. Chem*. **264:** 18751-18760.
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RECENT CONFERENCE PRESENTATIONS

1. Engineered Astaxanthin and Canthaxanthin biosynthesis in the polyextremophilic red alga *Cyanidioschyzon merolae* 10D. (2023). M. Seger, F. Mammadova, M. Villegas-Valencia, B. Bastos de Freitas, C. Chang, I. Isachsen, H. Hemstreet, F. Abualsaud, M. Boring, K.J. Lauersen, P.J. Lammers The 13th International Conference on Algal Biomass, Biofuels & Bioproducts, Kona, HI. USA.
2. Lammers, P.J., Seger, M., (2022) Mixotrophic Cultivation of Extremophilic Microalgae: Coupling Synthetic Biology with Wastewater Treatment. Joint Aquatic Sciences Meeting May 16-20, 2022.
3. Seger, M. and P.J. Lammers (2020) Metabolic gas exchange during mixotrophic cultivation of red algal extremophiles. The 10th International Conference on Algal Biomass, Biofuels & Bioproducts, Pittsburg, PA USA.
4. Seger M, Park W, Csakan N, Skavicus C, Jones B, Osgood M, Palety D, Lammers PJ* (2019) "Microaerobic mixotrophic production of heat-stable phycocyanin with enhanced substrate yields" The 9th International Conference on Algal Biomass, Biofuels & Bioproducts, Boulder, CO USA.
5. Seger M*, Park W, Csakan N, Lammers PJ (2018) "Efficient production of thermo-tolerant phycocynanin using the thermotolerant red alga Galdieria sulphuraria through forced metabolic gas exchange during mixotrophic growth." The 8th International Conference on Algal Biomass, Biofuels & Bioproducts, Seattle, WA USA.
6. Lammers PJ, Seger M, Park W, Csakan N (2018) "Metabolic gas exchange during mixotrophic growth diminishes catabolic repression of photosynthesis in red microalgae." The 27th annual Western Photosynthesis Conference, Oracle, AZ USA.
7. Seger M, Selvaratnam T, Green MF, Park W, Csaken N, Rashid N, Lammers PJ (2017) "Outdoor mixotrophic cultivation of two Galdieria sulphuraria strains using lignocellulosic hydrolysate as a carbon source."; The 7th International Conference on Algal Biomass, Biofuels & Bioproducts, Miami, FL, USA. T. Selvaratnam, M. Seger, **P.J. Lammers,** Ammonium uptake kinetics of *Galdieria sulphuraria*. Algae Biomass Summit, Phoenix, Arizona, USA, October 2016
8. M. Seger, T. Selvaratnam, N. Csakan, M. Green, and **P.J. Lammers**. Annual biomass productivity utilizing a crop rotation strategy in photobioreactor systems at the Arizona Center for Algae Technology and Innovation. Algae Biomass Summit, Phoenix, Arizona, USA, October 2016
9. T. Selvaratnam, M. Seger, **P.J. Lammers**. Nutrient uptake kinetics of *Galdieria sulphuraria*. The 6th

International Conference on Algal Biomass, Biofuels & Bioproducts, San Diego, USA, June 2016

10. M. Seger, M.F. Green, T. Selvaratnam, N. Csakan, P.J. Lammers. Molecular Diagnostic Tools (PCR and CAPS-analysis) of Red and Green Algae, an important step in Quality Control of Strain Stocks. The 6th International Conference on Algal Biomass, Biofuels & Bioproducts, San Diego, USA, June 2016
11. T. Selvaratnam, N. Nagamany, F.O. Holguin, **P.J. Lammers**. Maximizing nutrient and energy recovery from urban wastewaters using algal based systems. The 5th International Conference on Algal Biomass, Biofuels & Bioproducts, San Diego, USA, June 2015
12. **P.J. Lammers,** T. Selvaratnam, S.M. Henkanatte-Gedera, M. Seger, S. Deng, T. Muppaneni, N. Nirmalakhandan. Municipal wastewater treatment with a red algal extremophile, *Galdieria sulphuraria*. 5th International Conference on Algal Biomass, Biofuels & Bioproducts, San Diego, USA. June 2015
13. S.M. Henkanatte-Gedera, T. Selvaratnam, N. Nirmalakhandan, W.V. Voorhies, **P.J. Lammers**. Algal system for BOD and nutrient removal from urban wastewater. The 5th International Conference on Algal Biomass, Biofuels & Bioproducts, San Diego, USA, June 2015 (Poster)
14. T. Selvaratnam*, N. Nirmalakhandan, **Peter J. Lammers**. Energy efficient urban wastewater treatment using *Galdieria sulphuraria*. 249th ACS Denver National Meeting. Denver, Colorado, USA, 22-26, 2015
15. Tapaswy Muppaneni, Kodanda Phani Raj Dandamudi, Thinesh Selvaratnam, Nirmala Khandan, Tanner Schaub, Barry Dungan, Francisco Holguin, **Peter J. Lammers**, Wayne Voorhies and Shuguang Deng. Sequential Hydrothermal Liquefaction of *Galdieria sulphuraria* Algal Biomass to Enhance Biocrude Oil Yield. AIChE Annual Meeting, Salt Lake City, UT, 2015.
16. T. Selvaratnam*, A. Pegallapati, N. Khandan, **P. Lammers**. Algal system for net energy generation and nutrient recovery from urban wastewaters. 4th International Conference on Algal Biomass, Biofuels and Bioproducts, Santa Fe, NM, USA, June 15-18, 2014
17. M. Seger, W. Van Voorhies, T. Selvaratnam, F. Montoya, N. Khandan, A. Unc, **P.J. Lammers**. Genetic diversity in *Galdieria sulphuraria* strains and survivability of wastewater coliform bacteria under different pH, temperature, and CO_2 conditions. 4th International Conference on Algal Biomass, Biofuels and Bioproducts, Santa Fe, NM, USA, June 15-18, 2014 (Poster)
18. T. Selvaratnam***,** Pegallapati, A.K., Montelya, F., Rodriguez, G., Nirmalakhandan, N., Van Voorhies, W., **Lammers, P.J.** Feasibility of Algal Systems for Sustainable Wastewater Treatment. 3rd International Conference of Renewable Energy: Generation and Applications, Al Ain, UAE, March 2-5, 2014
19. Harvind Kumar Reddy, Tapaswy Muppaneni, Sundaravadivelnathan Ponnusamy, Thinesh Selvaratnam, Barry Dungan, Nagamany Nirmalakhandan, Tanner Schaub, Francisco Holguin, **Peter Lammers**, Wayne Voorhies and Shuguang Deng. Kinetic Modeling of Hydrothermal Liquefaction of Algal Biomass. AIChE Annual Meeting, Atlanta, GA, 2014
20. Pegallapati, T. Selvaratnam, N. Khandan, **P. J. Lammers**. Sustainable Urban Development: Options for Maximizing Energy Extraction from Domestic Wastewater. 8th Conference on Sustainable Development of Energy, Water and Environment Systems, Dubrovnik, Croatia, Sept. 22-27, 2013
21. Harvind Kumar Reddy, Thinesh Selvaratnam, Tapaswy Muppaneni, Nagamany Nirmalakhandan, Tanner Schaub, Barry Dungen, Nilusha Sudasinghe Appuhamilage, **Peter Lammers**, Wayne Voorhies and Shuguang Deng. Algal Biorefinery: Production of Biocrude Oil & Byproducts. AIChE Annual Meeting, San Francisco, CA, 2013

INVITED PRESENTATIONS

1. Invited Speaker: Extremophilic Platforms for Biotechnology. **King Abdullah University of Science and Technology**. Nov. 25, 2020.
2. Invited Speaker: A Mixotrophic Platform for Valorizing Multiple Waste Streams. **Society for**

Industrial Microbiology and Biotechnology. Annual Meeting. Denver, CO. July 31-Aug. 3, 2017.

3. Keynote Speaker: **Korean Society for Biotechnology and Bioengineering:** Algae-based treatment of urban and industrial wastewater. Oct. 13-14, 2016.
4. Invited Plenary Lecture: Algae in Hot Water: Cultivation Studies for Hot Arid Environments. **Asia-Oceania Algae Innovation Summit. Wuhan, China**, Sept 18-21, 2016.
5. Invited Lecture: Algae in Hot Water: Mixotrophic Cultivation of Red Algae Extremophiles, **Heinrich Henne University**, Dusseldorf, Germany, April 22, 2016
6. Invited Lecture: Algae in Hot Water, **Pacific Northwest National Laboratory**, June 29, 2015
7. Invited Lecture: Municipal Wastewater Treatment with a Red Algal Extremophile, *Galdieria sulphuraria*. **Algal Biomass, Biofuels and Bioproducts, San Diego, CA**, June 7-10, 2015.
8. Invited Lecture: Algal-based System for Energy-Positive Wastewater Treatment, **Asia-Oceania Algae Innovation Summit, Nov. 17-20, Daejeon, South Korea**
9. Invited Lecture: Quality Control Systems Reveal the Yin and Yang of Outdoor Algae Cultivation, **Algal Biomass, Biofuels and Bioproducts, Santa Fe, NM, June 16-18, 2014**
10. Invited Lecture: Algal Platforms for Energy Positive Ecosystem Services: 21st Century System Design for Hot Arid Climates. **Arizona State University**. May 13, 2014
11. Invited Lecture: **University of Nebraska, Lincoln.** "A Route to Algal Biofuels via EcoSystem Services: The Case for an Extremophile, *Galdieria sulphuraria*". Feb. 25, 2014.
12. Invited Lecture: "Multiple Pathways for University-Industry Innovation" **23rd National Science Foundation EPSCoR Conference.** Nashville, TN November 3-6, 2013.
13. Invited Lecture: **Algal Biomass Summit** 2013 September 30-October 3, 2013 (Orlando, FL) "Review of Photobioreactor Designs"
14. Cultivation and lipid profiles of thermo-tolerant, mixotrophic red algae *Galdieria sulfuraria* in inexpensive closed photobioreactors. **Algal Biomass, Biofuels and Bioproducts, Toronto, Canada, June 16-19, 2013**
15. Plenary Lecture: "Culture Practices to Improve the Growth Rate of *Nannochloropsis salina*". **8th Annual Meeting and Symposium Korean Society of Marine Biotechnology**. Nov. 15, 2012
16. "Algal Taxonomic Diversity Applied to Multi-Scale, Waste-To-Energy Process Development" **Biology Department, New Mexico State University. September 20, 2012**
17. Repeated nutrient additions enhance growth rate and reduce invader populations during outdoor photobioreactor cultivation of *Nannochloropsis salina*. **Algal Biomass, Biofuels and Bioproducts, San Diego, CA June 10-13, 2012**
18. The Lipidome of Nannochloropsis salina CCMP1776 Revealed by Fouier Transform – Ion Cyclotron Resonance Mass Spectrometry of Axenic Culture. **Algal Biomass, Biofuels and Bioproducts, St Louis, MO July 17-20, 2011**
19. " Algal Biomass and Lipidomics Research at New Mexico State University" **Arizona State University, Mesa AZ.** October 18, 2011
20. " Algal Biomass and Lipidomics Research at New Mexico State University" Department of Biochemistry, **Indian Institute of Science, Bangalore, India**. March 7, 2011
21. "Growth and Lipidomics Characterization of *Nannochloropsis salina* for Biofuels" **East China University of Science and Technology, Shanghai, China**. Oct 11, 2010
22. "Lipid analysis of oil-producing microalgae" 2010 QIBEBT Symposium on Algae for Energy. **Chinese Academy of Sciences, Qingdao, China**. Oct. 8, 2010.
23. "Microalgae Production in Photobioreactors", **PTT-Chem Corporation, Bangkok, Thailand**. March 22, 2010.

CURRENT AND RECENT GRANTS – Arizona State University

1. **A Blue-print for Single Step Algae Wastewater Treatment**, Xylem Inc. $412,808. 2020-2023
2. **Sustainable hydrogen production coupled to wastewater resources using a low oxygen cultivation system.** ASU-TRIF Lightworks $50,000 2021-2023. Co-PI with Kevin Redding.

3. **Decision-Model Supported Algal Cultivation Process Enhancement,** U.S. Dept of Energy. $3.5M, three years 2019-2022. Role: Co-investigator, P.I. John McGowen.
4. **A Novel Platform for Algal Biomass Production Using Cellulosic Mixotrophy - CeMix**.2016-2019 DOE-EERE Bioenergy Technology Incubator. Role – Principal Investigator. Amount $2M Partner Institutions: Colorado State and New Mexico State Universities, National Renewable Energy Laboratory, Heliae, Inc.
5. **Extreme solutions to extreme problems: studies of life at the edge using Cyanidiophyceae red algae.** DOE-Joint Genome Institute, Community Science Program 2020-2022. Funding: $0. CSP provides high-throughput sequencing for a consortium led by D. Battyachara (Rutgers, P.I.) Arizona State University (Lammers), Montana State University, Pacific Northwest National Laboratory.
6. **Sustainable hydrogen production coupled to wastewater resources using a low oxygen cultivation system.** 2022-2023 ASU-TRIF Lightworks, $50,000