Thomas St. Julien Lankiewicz

Ph.D. candidate in Ecology, Evolution, and Marine Biology

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# Education

Ph.D. candidate Sept 2016 – Present

*University of California Santa Barbara*

**M.S.**, Marine Studies, with a focus in Marine Biosciences Sept 2012 – Dec 2014

*University of Delaware*

**B.A.**, Biology Sept 2008 – May 2012

*Grinnell College*

# Publications

**Lankiewicz TS**, O’Malley MA. (2020). Efficiency is context-dependent; anaerobic efficiency contrasts with aerobic metabolism. *In preparation for submission.*

Wilken SE, Monk JM, Leggieri P, Lawson CE, **Lankiewicz TS**, Seppälä S, Daum C, Jenkins J, Lipzen A, Mondo SJ, Barry K, Grigoriev I, Henske JK, Theodorou M, Palsson BO, Petzold L, O’Malley MA. (2020). Experimentally validated reconstruction and analysis of a genome-scale metabolic model of an anaerobic Neocallimastigomycota fungus. *In press*.

Peng X, WilkenSE, **LankiewiczTS**, Gilmore SP, BrownJL, HenskeJK, SwiftCL, BarryK, TheodorouMK, GrigorievIV, ValentineDL, O’Malley MA. (2020). Sculpting gut microbial communities alters fermentation products and methane release.*In press.*

Bayer B, Saito MA, McIlvin MR, Lücker S, Moran DM, **Lankiewicz TS**, Dupont CL, Santoro AE (2020). Metabolic versatility of the nitrite-oxidizing bacterium Nitrospira marina and its proteomic response to oxygen-limited conditions. *Accepted.* *The ISME Journal*.

Wilken SE, Seppälä S**, Lankiewicz TS**, Saxena M, Henske JK, Salamov AA, GrigorievIV, O’Malley MA. (2019). Genomic and proteomic biases inform metabolic engineering strategies for anaerobic fungi. *Metabolic Engineering Communications.* 10: e00107. https://doi.org/10.1016/j.mec.2019.e00107

Gilmore SP**‡**, **Lankiewicz TS‡**, Wilken SE, Brown JL, Sexton JA, Henske JK, Theodorou MK, Valentine DL, O’Malley MA. (2019). Top-down enrichment guides in formation of synthetic microbial consortia for biomass degradation. (2019). *ACS Synthetic Biology*. 8: 2174−2185. https://doi.org/10.1021/acssynbio.9b00271

Wilken SE, Swift CL, Podolsky IA, **Lankiewicz TS**, Seppälä S, O’Malley MA. (2019). Linking ‘omics’ to function unlocks the biotech potential of non-model fungi. *Current Opinion in Systems Biology*. 14: 9–17. https://doi.org/10.1016/j.coisb.2019.02.001

Podolsky IA**‡**, Seppälä S**‡**, **Lankiewicz TS**, Brown JL, Swift CL, O’Malley MA. (2018). Harnessing nature’s anaerobes for biotechnology and bioprocessing.*Annual**Review of Chemical and Biomolecular Engineering.*10: 105-128. https://doi.org/10.1146/annurev-chembioeng-060718-030340

**Lankiewicz TS**, Cottrell MT, Kirchman DL. (2016). Growth rates and rRNA content of four marine bacteria in pure cultures and in the Delaware estuary. *The ISME Journal.* 10: 823–832. https://doi.org/10.1038/ismej.2015.156

‡ Indicates equal contribution by first authors

Presentations

***Prospecting for novel lignin-active enzymes in ruminant gut microbiomes***

Joint Bioenergy Institute (JBEI) Annual Meeting, September 2020, invited speaker

***Characterizing lignin-active enzymes in anaerobic fungi***

Engineering Biology Research Consortium (EBRC) Annual Meeting, June 2020, speaker

***Characterizing lignin-active enzymes in anaerobic fungi***

Engineering Biology Research Consortium (EBRC) Annual Meeting, April 2020, poster presenter, best poster award winner

***Characterizing lignin-active enzymes in anaerobic fungi***

Department of Energy Annual Review of the Joint Bioenergy Institute (JBEI), December 2019, invited poster presenter

***Characterizing lignin-active enzymes in anaerobic fungi***

Joint Bioenergy Institute (JBEI) Annual Meeting, June 2019, invited speaker

***Characterizing lignin-active enzymes in anaerobic fungi for biomass deconstruction***

American Chemical Society Annual Meeting, April 2019, speaker

***Identifying and Characterizing Lignin-active Enzymes in Anaerobic Fungi***

Fungal Genetics Conference, March 2019, poster presenter

# Academic Awards

**EBRC 2020 Annual (Virtual) Meeting- Poster Session Award** April 2020

*Engineering Biology Research Consortium (EBRC)*

**The Center for Microbial Oceanography Research and Education Selected Course Participant** Summer 2013

*Agouron Institute, Gordon and Betty Moore Foundation, NSF, University of Hawai’i Manoa*

**Marine Biosciences Departmental Fellow** 2012 – 2013

*University of Delaware*

**Academic All-Conference** 2012

*The Midwest Conference*

**Trustee Honor Scholarship Recipient** 2008 – 2012

*Grinnell College*

# Research Experience

**Ph.D. candidate,** with Dr. Michelle O’Malley Jun 2018 – Present

*Ecology, Evolution, and Marine Biology, Department*

*University of California Santa Barbara*

Dissertation title:

Identifying and Characterizing Lignin Active Enzymes in Anaerobic Fungi

My work in the O’Malley lab involves bioprospecting non-model organisms, specifically the anaerobic gut fungi (AGF), for useful and novel enzymes. The applications of anaerobic gut fungi have been demonstrated in the context of cellulose deconstruction, but their activity against the lignin portion of lignocellulose is uncharacterized. My task is to identify enzymes having action against lignin and then describe the mechanisms by which anaerobic fungi modify lignin.

**Microbial cultivation, molecular biology, and geochemistry technician**  Jan 2015 – May 2018

*University of Maryland and University of California Santa Barbara*

I cultivated and designed experiments with several strains of ammonia-oxidizing archaea and nitrite-oxidizing bacteria and conducted analytical chemistry assays. I also extracted DNA samples taken from microbial observatory sites.

**Graduate student research assistant (MS)**,with Dr. David Kirchman Sept 2012 – Dec 2014

*Microbial Ecology Lab*

*University of Delaware*

I evaluated the relationship between growth rate and cellular rRNA content for four naturally abundant marine bacteria using qPCR and RT-qPCR, allowing for more accurate estimates of microbial growth rate in the environment. During this degree I also was the primary collector of field samples for the Kirchman Lab which involved many research cruises and techniques

**Undergraduate research assistant**,with Dr. Vincent Eckhart Jan 2012 – May 2012

*Evolutionary Plant Ecology Lab*

*Grinnell College*

I quantified tannin synthesis pathway enzyme transcripts in the flower buds of *Clarkia xantiana* using RT-qPCR.

Mentorship of junior researchers

Miguel Castaneda-Renteria, University of California Santa Barbara, Spring 2020 – Present

Undergraduate, Chemical Engineering

Co-mentor with Stephen Lillington

Derek Tang, University of California Santa Barbara, Fall 2019 – Spring 2020

Undergraduate, Microbiology

Alex Smith, University of California Santa Barbara, Fall 2018 – Spring 2019

Undergraduate, Microbiology

Instructional and teaching experience

Teaching AssistantforChemE 171/271: **‘Omics in biotechnology** Spring 2019

*University of California Santa Barbara, ChemE*

I was an instructional assistant for a graduate-level course integrating genomic, transcriptomic, metabolomic, and proteomic approaches to quantify and understand intricate biological systems focusing on microbial biotechnology.

Lab Teaching Assistantfor MCDB 2BL: **Introduction to Ecology and Organism Physiology** Summer 2018

*University of California Santa Barbara, MCDB*

I was the instructor for two laboratory sections per week. This course covered basic laboratory techniques and basic animal and plant physiology in model systems and introduced fundamental concepts in ecology.

Lab Teaching Assistantfor EEMB 3L: **Diversity of Life** Spring 2018

*University of California Santa Barbara, EEMB*

I was the instructor for two laboratory sections per week. This course covered basic laboratory techniques and introduced students to diversity in different contexts, from bacteria and protists to plants and animals.

Teaching Assistantfor MCDB 1B: **Introduction to Biochemistry,** Winter 2018

**Cell Biology, Developmental Biology, and Genetics**

*University of California Santa Barbara, MCDB*

These responsibilities were the same as for MCDB1A (see below), except that this portion of the course is more focused on developmental and organismal biology than biochemistry and cell biology.

Teaching Assistant for MCDB 1A: **Introduction to Biochemistry,** Fall 2017

**Cell Biology, Developmental Biology, and Genetics**

*University of California Santa Barbara, MCDB*

Responsibilities were similar to summer session TAing (see below) except that office hours were more limited. Instead of having extended office hours, there were biweekly active learning sessions for the students that were run by myself with the assistance of a group of undergraduate learning assistants. I was also responsible for editing the worksheet that we would use for the active learning activities

Teaching Assistantfor MCDB 1A: **Introduction to Biochemistry,**  Summer 2017

**Cell Biology, Developmental Biology, and Genetics**

*University of California Santa Barbara, MCDB*

As a lecture assistant, I helped with making exams and quiz questions; I also graded exams and held daily office hours to find extra help with the material.

Teaching assistantfor BIO 252**:** **Organisms, Evolution, and Ecology** Spring2012

*Grinnell College, Biology Department*

As the lab and course teaching assistant, I helped with lab preparation and mentoring students during activities. I also gave two nighttime review lectures, followed by open question sessions per week.

Swim coach and private swim instructor Spring 2009 - Summer 2013

*Lane Swim Club, Wilmington, Delaware and Grinnell, Iowa*

As head coach of 110 swimmer summer team for two years, I supervised two assistant coaches, managed and ran practices, prepared competition entries, and organized team logistics. I also offered 1:1 private instruction to swimmers wishing to improve their skills rapidly.

Nonacademic awards and achievements

**11 x Midwest Conference Gold Medalist** 2009 – 2012

*Midwest Conference*

**Varsity Letter Winner** 2009 – 2012

*Grinnell College*

**Most Valuable Swimmer** 2009, 2010

*Grinnell College Swim Team*

**Freshman Athlete of the Year** 2009

*Grinnell College*