

SIMON LAX

Postdoctoral Researcher

Physics of Living Systems, Department of Physics, MIT
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Education

The University of Chicago

Ph.D., Ecology and Evolution

Advisors: Dr. Jack A. Gilbert & Dr. Catherine Pfister

Thesis: “*Our Microbial Interaction with Built Environments*”

Chicago, IL

2012 - 2017

Columbia University

B.A., Environmental Biology

Advisor: Dr. Gregory O’Mullan

Thesis: “*Proteobacteria Dominate the Bacterial Diversity in the Deep Seafloor Sediments of the Cascadia Margin*”

New York, NY

2005 - 2009

Professional Experience

Physics of Living Systems Group, Department of Physics, MIT

Postdoctoral Researcher

Cambridge, MA

2017 - Present

Research Foundation of CUNY

Research Assistant

New York, NY

2010 - 2012

Institute for Cancer Genetics, Columbia University

Research Assistant

New York, NY

2009 - 2010

Publications

3524 Citations, *h*-index: 19, *i*10-index: 21 (March 31st, 2023)

All PDFs available at simonlax.com/publications

“*” indicates shared first authorship

[23] A phylogeny-informed analysis of the global coral-Symbiodiniaceae interaction network reveals that traits correlated with thermal bleaching are specific to symbiont transmission mode

Swain, T. D.*, Lax, S.*, Backman, V., & Marcelino, L. A.

mSystems, 2021

DOI: [10.1128/mSystems.00266-21](https://doi.org/10.1128/mSystems.00266-21)

[22] Detecting personal microbiota signatures at artificial crime scenes

Jarrad T. Hampton-Marcell, Peter Larsen, Tifani Anton, Lauren Cralle, Naseer Sangwan, Simon Lax, Neil Gottel, Mariana Salas-Garcia, Candace Young, George Duncan, Jose V. Lopez, Jack A. Gilbert

Forensic Science International, 2020

DOI: [10.1016/j.forsciint.2020.110351](https://doi.org/10.1016/j.forsciint.2020.110351)

[21] Uncovering the role of Symbiodiniaceae assemblage composition and abundance in coral bleaching response by minimizing sampling and evolutionary biases

Timothy D. Swain*, Simon Lax*, Vadim Backman, Luisa A. Marcelino

BMC Microbiology, 2020

DOI: [10.1186/s12866-020-01765-z](https://doi.org/10.1186/s12866-020-01765-z)

[20] Higher temperatures generically favor slower-growing bacterial species in multi-species communities

Simon Lax, Clare Abreu, Jeff Gore

Nature Ecology & Evolution, 2020

DOI: [10.1038/s41559-020-1126-5](https://doi.org/10.1038/s41559-020-1126-5)

[19] Microbial similarity between students in a common dormitory environment reveals the forensic potential of individual microbial signatures

Miles Richardson, Neil Gottel, Jack A. Gilbert, Simon Lax

mBio, 10:4, e01054-19, 2019

DOI: [10.1128/mBio.01054-19](https://doi.org/10.1128/mBio.01054-19)

[18] Microbial and metabolic succession on common building materials under high humidity conditions

Simon Lax, Cesar Cardona, Dan Zhao, Valerie J. Winton, Gabriel Goodney, Peng Gao, Neil Gottel, Erica M.

Hartmann, Chris Henry, Paul M. Thomas, Scott T. Kelley, Brent Stephens, Jack A. Gilbert

Nature Communications, 10:1767, 2019

DOI: [10.1038/s41467-019-09764-z](https://doi.org/10.1038/s41467-019-09764-z)

[17] Relating coral skeletal structures at different length scales to growth, light availability to *Symbiodinium*, and thermal bleaching

Timothy D Swain, Simon Lax, Natalie Lake, Hannah Grooms, Vadim Backman, Luisa A Marcelino

Frontiers in Marine Science, 5, 450, 2018

DOI: [10.3389/fmars.2018.00450](https://doi.org/10.3389/fmars.2018.00450)

[16] Environmental sources of bacteria differentially influence host-associated microbial dynamics

Cesar Cardona, Simon Lax, Peter Larsen, Brent Stephens, Jarrad Hampton-Marcell, Christian F. Edwardson, Chris Henry, Bill

Van Bonn, Jack A. Gilbert

mSystems, 3, e00052-18, 2018

DOI: [10.1128/mSystems.00052-18](https://doi.org/10.1128/mSystems.00052-18)

[15] Bacterial colonization and succession in a newly opened hospital

Simon Lax, Naseer Sangwan, Daniel Smith, Peter Larsen, Kim M. Handley, Miles Richardson, Kristina Guyton, Monika Krezalek, Benjamin D. Shogan, Jennifer Defazio, Irma Flemming, Baddr Shakhsheer, Stephen Weber, Emily Landon, Sylvia Garcia-Houchins, Jeffrey Siegel, John Alverdy, Rob Knight, Brent Stephens, Jack A. Gilbert

Science Translational Medicine 9(391), eaah6500, 2017

DOI: [10.1126/scitranslmed.aah6500](https://doi.org/10.1126/scitranslmed.aah6500)

[14] Microbial community assembly and metabolic function during mammalian corpse decomposition

Jessica L. Metcalf, Zhenjiang Zech Xu, Sophie Weiss, Simon Lax, Will Van Treuren, Embriette R. Hyde, Se Jin Song, Amnon Amir, Peter Larsen, Naseer Sangwan, Daniel Haarmann, Greg C. Humphrey, Gail Ackermann, Luke R. Thompson, Christian Lauber, Alexander Bibat, Catherine Nicholas, Matthew J. Gebert, Joseph F. Petrosino, Sasha C. Reed, Jack A. Gilbert, Aaron M. Lynne, Sibyl R. Bucheli, David O. Carter, Rob Knight

Science 351(6269), 158-162, 2016

DOI: [10.1126/science.aad2646](https://doi.org/10.1126/science.aad2646)

[13] The influence of age and gender on skin-associated microbial communities in urban and rural human populations

Shi Ying, Dan-Ning Zeng, Liang Chi, Yuan Tan, Carlos Galzote, Cesar Cardona, Simon Lax, Jack Gilbert, Zhe-Xue Quan

PLoS One 10 (10) e0141842, 2015

DOI: [10.1371/journal.pone.0141842](https://doi.org/10.1371/journal.pone.0141842)

[12] Athletic equipment microbiota are shaped by interactions with human skin

Mariah Wood, Sean M. Gibbons, Simon Lax, Tifani W. Eshoo-Anton, Sarah M. Owens, Suzanne Kennedy, Jack A. Gilbert, Jarrad T. Hampton-Marcell

Microbiome 3(25), 2015

DOI: [10.1186/s40168-015-0088-3](https://doi.org/10.1186/s40168-015-0088-3)

[11] Forensic analysis of the microbiome of phones and shoes

Simon Lax, Jarrad Hampton-Marcell, Sean M. Gibbons, Geórgia Barguil Colares, Daniel Smith, Jonathan Eisen, Jack A. Gilbert

Microbiome 3(21), 2015

DOI: [10.1186/s40168-015-0082-9](https://doi.org/10.1186/s40168-015-0082-9)

[10] Hospital-associated microbiota and implications for nosocomial infections

Simon Lax & Jack A. Gilbert

Trends in Molecular Medicine 21(7), 427-432, 2015

DOI: [10.1016/j.molmed.2015.03.005](https://doi.org/10.1016/j.molmed.2015.03.005)

[9] Collagen degradation and MMP9 activation by *Enterococcus faecalis* contribute to intestinal anastomotic leak

Benjamin D. Shogan, Natalia Belogortseva, Preston M. Luong, Alexander Zaborin, **Simon Lax**, Cindy Bethel, Marc Ward, Joseph P. Muldoon, Mark Singer, Gary An, Konstantin Umanskiy, Vani Konda, Baddr Shakhsheer, James Luo, Robin Klabbers, Lynn E. Hancock, Jack A. Gilbert, Olga Zaborina, John C. Alverdy

Science Translational Medicine 7(286), 286ra68, 2015

DOI: [10.1126/scitranslmed.3010658](https://doi.org/10.1126/scitranslmed.3010658)

[8] The soil microbiome influences grapevine-associated microbiota

Iratxe Zarraonaindia, Sarah M. Owens, Pamela Weisenhorn, Kristin West, Jarrad Hampton-Marcell, **Simon Lax**, Nicholas A. Bokulich, David A. Mills, Gilles Martin, Safiyh Taghavi, Daniel van der Lelie, Jack A. Gilbert

mBio 6(2), e02527-14, 2015

DOI: [10.1128/mBio.02527-14](https://doi.org/10.1128/mBio.02527-14)

[7] Our interface with the built environment: immunity and the indoor microbiota

Simon Lax, Cathryn R Nagler, Jack A Gilbert

Trends in Immunology 36(3), 121-123, 2015

DOI: [10.1016/j.it.2015.01.001](https://doi.org/10.1016/j.it.2015.01.001)

[6] Longitudinal analysis of microbial interaction between humans and the indoor environment

Simon Lax, Daniel P Smith, Jarrad Hampton-Marcell, Sarah M Owens, Kim M Handley, Nicole M Scott, Sean M Gibbons, Peter Larsen, Benjamin D Shogan, Sophie Weiss, Jessica L Metcalf, Luke K Ursell, Yoshiki Vázquez-Baeza, Will Van Treuren, Nur A Hasan, Molly K Gibson, Rita Colwell, Gautam Dantas, Rob Knight, Jack A Gilbert

Science 345(6200), 1048-1052, 2014

DOI: [10.1126/science.1254529](https://doi.org/10.1126/science.1254529)

[5] The gut of geographically disparate *Ciona intestinalis* harbors a core microbiota

Larry J Dishaw*, Jaime Flores-Torres*, **Simon Lax***, Kristina Gemayel, Brittany Leigh, Daniela Melillo, M Gail Mueller, Lenina Natale, Ivana Zucchetti, Rosaria De Santis, Maria Rosaria Pinto, Gary W Litman, Jack A Gilbert

PLoS One 9(4), e93386, 2014

DOI: [10.1371/journal.pone.0093386](https://doi.org/10.1371/journal.pone.0093386)

[4] Reconstructing an ancestral genotype of two hexachlorocyclohexane-degrading *Sphingobium* species using metagenomic sequence data

Naseer Sangwan, Helianthous Verma, Roshan Kumar, Vivek Negi, **Simon Lax**, Paramjit Khurana, Jitendra P Khurana, Jack A Gilbert, Rup Lal

The ISME Journal 8, 398-408, 2013

DOI: [10.1038/ismej.2013.153](https://doi.org/10.1038/ismej.2013.153)

[3] Comparative anatomy of chromosomal domains with imprinted and non-imprinted allele-specific DNA methylation

Anupam Paliwal, Alexis M Temkin, Kristi Kerkel, Alexander Yale, Iveta Yotova, Natalia Drost, **Simon Lax**, Chia-Ling Nhan-Chang, Charles Powell, Alain Borczuk, Abraham Aviv, Ronald Wapner, Xiaowei Chen, Peter L Nagy, Nicholas Schork, Catherine Do, Ali Torkamani, Benjamin Tycko

PLoS Genetics 9(8), e1003622, 2013

DOI: [10.1371/journal.pgen.1003622](https://doi.org/10.1371/journal.pgen.1003622)

[2] Variants in CYP17 and CYP19 cytochrome P450 genes are associated with onset of Alzheimer's disease in women with Down syndrome

Constance Chace, Deborah Pang, Catherine Weng, Alexis Temkin, **Simon Lax**, Wayne Silverman, Warren Zigman, Michel Ferin, Joseph H Lee, Benjamin Tycko, Nicole Schupf

Journal of Alzheimer's Disease 28(3), 601-612, **2012**

DOI: 10.3233/JAD-2011-110860

[1] Can glacial erosion limit the extent of glaciation?

Michael R Kaplan, Andrew S Hein, Alun Hubbard, **Simon Lax**

Geomorphology 103(2), 172-179, **2009**

DOI:10.1016/j.geomorph.2008.04.020

Publications in Preparation

[A] Strong ethanol- and density-dependent ecological interactions within a consortium of wine-fermenting yeasts

Simon Lax & Jeff Gore

Book Chapters

[1] Forensic Microbiology in Built Environments

Simon Lax & Jack A Gilbert

Forensic Microbiology, Chapter 13, p. 328, John Wiley & Sons, **2017**

Teaching Experience

The University of Chicago (Teaching Assistant)

Chicago, IL

BIOS 20196: Ecology and Conservation

Fall 2016

BIOS 15123: The Microbiome in Human and Environmental Health

Spring 2015

CUNY Queens College (Adjunct Faculty)

New York, NY

ENSCI 100: Our Planet in the 21st Century

4 Sections (2010 - 2011)

Guest Lectures

Public and Environmental Health (Northwestern University)

Feb. 2016, Feb. 2017

The Microbiome in Human and Environmental Health (University of Chicago)

April 2016

Invited Talks

Kingdom Supercultures Seminar Series

New York, NY

“Environmental impacts on ecological interactions across scales”

May 2022

6th Theodor Escherich Symposium on Microbiome Research

Graz, AU

“Colonization and Succession of Hospital-Associated Bacteria”

November 2019

11th Healthcare Infection Society International Conference

Liverpool, UK

“Colonization and Succession of Hospital-Associated Bacteria”

November 2018

School of Biology and Ecology, The University of Maine

Orono, ME

“Our Microbial Interaction with Built Environments”

October 2018

Department of Biology, The University of Alaska

Fairbanks, AK

“Our Microbial Interaction with Built Environments”

February 2017

Yale-NUS Conference on Infectious Disease Transmission in Built Environments

Singapore

“Bacterial Transmission in the Hospital Environment”

January 2017

American Society for Microbiology/Society for Applied Microbiology

Boston, MA

“Effects of Biocides on the Hospital Microbiome”	<i>June 2016</i>
The Society for Healthcare Epidemiology of America	Atlanta, GA
“The Microbiome of the Built Hospital Environment”	<i>May 2016</i>
Department of Microbiology, The University of Wisconsin	La Crosse, WI
“Our Microbial Interaction with Built Environments”	<i>March 2016</i>
VIZBI 2015 (Visualization of Biological Data Conference)	Cambridge, MA
“Visualizing Large Datasets in Microbial Ecology”	<i>March 2015</i>
Chinese Academy of Soil Sciences	Nanjing, CN
“Microbial Interaction between Humans and the Built Environment”	<i>February 2015</i>

Contributed Talks

Gordon Research Seminar: Microbial Population Biology	Andover, NH
“Higher Temperatures Generically Favor Slower-Growing Species in Multispecies Communities”	<i>July 2019</i>
American Physical Society March Meeting	Boston, MA
"Increasing Temperature Favors Slower-Growing Bacterial Species"	<i>March 2019</i>
American Academy of Forensic Sciences	Las Vegas, NV
“Inferring Patterns of Occupancy from Human Microbial Signatures”	<i>February 2016</i>
Sloan Conference on the Microbiology of the Built Environment	Boulder, CO
“Colonization and Succession of Hospital-Associated Microbial Communities”	<i>July 2015</i>
Environmental Design Research Association	Los Angeles, CA
“Our Microbial Interaction with the Built Environment”	<i>May 2015</i>
Geological Society of America Northeastern Meeting	Hartford, CT
“Ammonia-Oxidizing Microbial Communities along the Salinity Gradient of the Cape Fear Estuary”	<i>March 2012</i>

Service

Editor: mSystems

Peer reviewer: PNAS, Nature Ecology & Evolution, Nature Communications, The ISME Journal, Scientific Reports, Applied and Environmental Microbiology, Biology Letters, PLoS One, Microbial Ecology, Environmental Microbiology, Applied Microbiology and Biotechnology, Marine Genomics, BMC Infectious Diseases, PeerJ

Mentorship

Undergraduate Research Supervised

Miles Richardson, University of Chicago

2015 - 2017