

## Jonathan B. Lynch, PhD

Department of Integrative Biology and Physiology  
University of California-Los Angeles  
610 Charles E Young Drive, East  
jblynch@g.ucla.edu

### Education and Training

- Assistant Project Scientist 2019-present  
University of California-Los Angeles  
Department of Integrative Biology and Physiology  
Dr. Elaine Hsiao lab
- Postdoctoral Fellow 2015-2019  
University of Wisconsin-Madison/University of Hawai'i-Mānoa  
Pacific Biosciences Research Center  
Dr. Edward (Ned) Ruby lab
- Postdoctoral Researcher 2014-2015  
Stanford University School of Medicine  
Department of Microbiology and Immunology  
Dr. Justin Sonnenburg lab
- Graduate Student Researcher 2008-2014  
Stanford University School of Medicine  
PhD, Microbiology and Immunology  
Dr. Justin Sonnenburg lab  
Thesis title: *Exploration of the regulatory networks of hybrid two-component systems in the model gut symbiont Bacteroides thetaiotaomicron*
- BA, *magna cum laude*, in Biology (with honors), Psychology 2004-2008  
University of Pennsylvania  
Undergraduate Researcher  
Dr. Bob Doms lab
- 2006-2008

### Awards and Fellowships

- Intersections Science Fellowship 2021
- Ford Foundation Postdoctoral Fellowship 2020-2021
- NIH-NIGMS Ruth L. Kirschstein NRSA Individual Postdoctoral Fellowship 2016-2019
- ASM Conference on Beneficial Microbes Travel Grant 2016
- Stanford Biosciences Interview Session Speaker 2015
- Stanford School of Medicine Graduate Student Graduation Speaker 2014
- Leadership in Diversity Award 2014
- Best poster-Stanford Department of Microbiology and Immunology retreat 2010
- Biomedical Association for the Interest of Minority Students, VP 2010-2011
- National Science Foundation Graduate Research Fellowship 2010-2014

**Publications**

1. Cohen SK, Aschtgen M-S, Jonathan B. Lynch, Koehler S, Chen F, Escrig S, Daraspe J, Ruby EG, Meibom A, McFall-Ngai M. Tracking the cargo of extracellular symbionts into host tissues with correlated electron microscopy and nanoscale secondary ion mass spectrometry imaging. *Cellular Microbiology* 22, 2020.
2. Jonathan B. Lynch<sup>§</sup>, Hsiao EY. Microbiomes as sources of emergent host phenotypes. *Science*, (365)6460, 2019. –*Highlighted in Faculty Opinions, 2020*
3. Schwartzman JA\*, Jonathan B. Lynch\*, Flores Ramos S, Zhou L, Apicella MA., Yew JY, Ruby EG. Acidic pH promotes lipopolysaccharide modification and alters colonization in a bacteria–animal mutualism. *Molecular Microbiology*, 112(4), 2019.
4. Jonathan B. Lynch, Schwartzman JA, Bennett BD, McAnulty SJ, Knop M, Nyholm SV, Ruby EG. Ambient pH Alters the Protein Content of Outer Membrane Vesicles, Driving Host Development in a Beneficial Symbiosis. *Journal of Bacteriology*, 201(20), 2019.
5. Jonathan B. Lynch<sup>§</sup> and Alegado RA<sup>§</sup>. Spheres of hope, packets of doom: the good and bad of Outer Membrane Vesicles (OMVs) in interspecies and ecological dynamics. *Journal of Bacteriology*, 199(15), 2017.
6. Aschtgen MS, Jonathan B. Lynch, Koch E, Schwartzman J, McFall-Ngai M, Ruby E. Rotation of *Vibrio fischeri* flagella produces outer membrane vesicles that induce host development. *Journal of Bacteriology* 198(16), 2016.
7. Ng KM, Ferreyra JA, Higginbottom SK, Jonathan B. Lynch, Kashyap PC, Gopinath S, Naidu N, Choudhury B, Weimer BC, Monack DM, Sonnenburg JL. Microbiota-liberated host sugars facilitate post-antibiotic expansion of enteric pathogens. *Nature* 502(7469), 2013.
8. Jonathan B. Lynch and Sonnenburg JL. Prioritization of a plant polysaccharide over a mucus carbohydrate is enforced by a *Bacteroides* hybrid two-component system. *Molecular Microbiology* 85(3), 2012.
9. Harrison JE, Jonathan B. Lynch, Sierra LJ, Blackburn LA, Ray N, Collman RG, Doms RW. Baseline resistance of primary human immunodeficiency virus type 1 strains to the CXCR4 inhibitor AMD3100. *Journal of Virology* 82(23), 2008.

*In preparation*

1. Vroom M, Rodriguez-Ocasio Y., Jonathan B. Lynch, Ruby E, Foster J. Modeled microgravity alters lipopolysaccharide and outer membrane vesicle production of the beneficial symbiont *Vibrio fischeri*. *In revision*.
2. Jonathan B. Lynch, Bennett BD, Merrill BD, Ruby EG, Hryckowian AJ. A model symbiosis reveals host- and symbiont derived phage protection mechanisms. *In prep*.

\* - Equal contributors

§ - Corresponding author

**Presentations (underline denotes presenter, \*-Invited)**

### Oral presentations

- Jonathan B. Lynch, Hsiao EY. Exploring the effects of gut microbes on neurotransmitter dynamics and fat metabolism. 2020 Conference of Ford Fellows, *online* (2020).
- Jonathan B. Lynch\*, Hsiao EY. Bidirectional relationships between serotonin and the gut microbiota. IDWeek2020, *online* (2020).
- Jonathan B. Lynch\*, Hsiao EY. Bidirectional relationships between serotonin and the gut microbiota. Virtual Microbiome Summit, *online* (2020).
- Jonathan B. Lynch\*, Hsiao EY. Interplay between serotonin and the gut microbiota. Gut Microbiota for Health World Summit, Madrid, Spain (2020).
- Jonathan B. Lynch, Takagi D. The role of bacterial flagellar positioning on motility in host animal microenvironments. *C-MAIKI Meeting*, Honolulu, HI (2018, 2019).
- Jonathan B. Lynch, Ruby EG. Environmental pH drives symbiotic development through outer membrane vesicle variation. *30<sup>th</sup> Annual Squid-Vibrio Meeting*, La Jolla, CA (2018).
- Jonathan B. Lynch\*, Ruby EG. Bacterial outer membrane vesicles are altered by environment and drive symbiotic responses. *Microbiology Department Seminar*, Honolulu, HI (2017).
- Jonathan B. Lynch, Ruby EG. Outer membrane vesicles change with environment and drive symbiotic development. *Cell and Molecular Biology Seminar*, Honolulu, HI (2016).
- Jonathan B. Lynch\*, Aliashkevich A, Cava F, Ruby EG. Exploring the role that *Vibrio fischeri* outer membrane vesicles play in animal-bacterial symbiosis. *Department of Molecular Biology Seminar*, Umeå, Sweden (2016).
- Jonathan B. Lynch, Gromek SM, Balunas MJ, Ruby E. Environmental conditions affect *Vibrio fischeri* outer membrane vesicles that drive development of an animal host. *ASM Conference on Beneficial Microbes*, Seattle, WA (2016).
- Jonathan B. Lynch, Knop M, Cao S, Ruby EG. Analysis of *Vibrio fischeri* outer membrane vesicles and their role in animal-bacteria symbiosis. *Investigations of Host-Microbe Interactions*, Honolulu, HI (2016).
- Jonathan B. Lynch, Ruby EG. Molecular characterization of *Vibrio fischeri* outer membrane vesicles and their role in an animal-bacteria symbiosis. *Pacific Biosciences Research Center Seminar*, Honolulu, HI (2016).
- Jonathan B. Lynch\*. Chalk talk. *Huang Lab Retreat*, Lake Tahoe, CA (2012)
- Jonathan B. Lynch, Sonnenburg JL. Bacteroides prioritization of a plant polysaccharide over a mucus carbohydrate is enforced by a hybrid two-component system. *Stanford University Bug Club Seminar*, Stanford, CA (2012).
- Jonathan B. Lynch\*, Sonnenburg JL. Prioritization of a plant polysaccharide over a mucus sugar is enforced by a Bacteroides hybrid two-component system. *10<sup>th</sup> Annual International Student Seminar*, Kyoto, Japan (2012).
- Jonathan B. Lynch, Sonnenburg JL. Prioritization of a plant polysaccharide over a mucus sugar is enforced by a Bacteroides hybrid two-component system. *Stanford University Department of Microbiology and Immunology Departmental Retreat*, Santa Cruz, CA (2011).
- Jonathan B. Lynch\*, Huang KC, Sonnenburg JL. Bacteroides prioritization of a plant polysaccharide over a mucus carbohydrate is enforced by a hybrid two-component system. *Huang-Gopinathan Lab Retreat*, Tahoe, CA/Yosemite, CA (2011).

- Jonathan B. Lynch, Sonnenburg JL. Prioritization of a plant polysaccharide over a mucus sugar is enforced by a *Bacteroides* hybrid two-component system. *UC-Berkeley XII Microbiology Student Symposium*, Berkeley, CA (2011)
- Jonathan B. Lynch, Sonnenburg JL. Prioritization of a plant polysaccharide over a mucus sugar is enforced by a *Bacteroides* hybrid two-component system. *West Coast Bacterial Physiologists Asilomar Conference*, Asilomar, CA (2010).

#### *Poster presentations*

- Jonathan B. Lynch, McAnulty SJ, Nyholm SV, Ruby EG. Environmental pH drives developmental phenotypes through modulation of outer membrane vesicle proteins. *Beneficial Microbes Conference*, Madison, WI (2018).
- Jonathan B. Lynch, Gromek SM, Balunas MJ, Ruby EG. Ambient pH alters molecular loading in bacterial outer membrane vesicles, mediating symbiotic responses from an animal host. *ASM Conference on the Biology of Vibrios 2017*, Chicago, IL (2017).
- Jonathan B. Lynch, Gromek SM, Balunas MJ, Ruby EG. Determining the composition of *Vibrio fischeri* outer membrane vesicles that can mediate symbiotic responses. *ASM Conference on Beneficial Microbes*, Seattle, WA (2016).
- Jonathan B. Lynch, Sonnenburg JL. Prioritization of a plant polysaccharide over a mucus sugar is enforced by a *Bacteroides* hybrid two-component system. *10<sup>th</sup> Annual International Student Seminar*, Kyoto, Japan (2012).
- Jonathan B. Lynch, Sonnenburg JL. Prioritization of a plant polysaccharide over a mucus sugar is enforced by a *Bacteroides* hybrid two-component system. *Stanford University Department of Microbiology and Immunology Departmental Retreat*, Santa Cruz, CA (2010).
- Jonathan B. Lynch, Ray N, Doms RW. HIV patterns of sensitivity to entry inhibiting drugs including the fusion inhibitor drug Enfuvirtide. *Symposium for Undergraduate Research in Biology*, University of Pennsylvania, Philadelphia, PA (2008).

#### *Panel presentations*

- Jonathan B. Lynch<sup>§</sup>, Sedano C., Shastri A., Reyes T., Colbert K. If I only knew then what I know now: retrospective insights into grad school applications. *2011 Society for the Advancement of Chicanos and Native Americans in Science (SACNAS) Annual Conference*, San Jose, CA (2011). <sup>§</sup> - Panel organizer and chair

#### **Supplemental funding received**

- University of Hawai'i C-MAIKI seed grant-\$12,000 2017
- Stanford Univ. Center for Biomedical Imaging at Stanford seed grant-\$25,000 2012

#### **Teaching Experience**

- Marine Microbiology (MICRO401), University of Hawai'i 2016, 2017  
*Guest lecturer on animal-bacterial symbiosis*
- Educational Program for Gifted Youth (EPGY), Stanford, CA 2013  
*Course creator, instructor and TA organizer for intensive microbiology course (classroom and lab)*
- Stanford Department of Microbiology and Immunology, Stanford, CA 2011, 2012  
*Teaching assistant for graduate pathogenesis course/course designer and project leader for first iteration of graduate level computational microbiology course*

- Boys and Girls Club of the Peninsula, East Palo Alto, CA 2011-2015  
*Tutor and mentor for high school student*

### Students trained

- Alisa Voll: masters student, University of California-Los Angeles, Los Angeles, CA
- Kayli Choy: undergraduate student, University of California-Los Angeles, Los Angeles, CA
- Erika Gonzalez: undergraduate student, University of California-Los Angeles, Los Angeles, CA
- Katie Murphy: undergraduate student, University of Hawai‘i-Mānoa, Honolulu, HI
- Mirjam Knop: graduate intern, Christian-Albrechts-University, Kiel, Germany
- Nathan Goo: undergraduate student, University of Hawai‘i-Mānoa, Honolulu, HI
- Lynn Luu: undergraduate student, University of Hawai‘i-Mānoa, Honolulu, HI

### Postgraduate training

- Cold Spring Harbor Advanced Bacteria Genetics Course
- ASM Science Teaching Fellows Program

### Science Outreach

- Winter Intersession Hawaii USA 2017, 2018  
*Organized meeting for visiting undergraduates from the University of Mississippi*
- Campaign for Stanford Medicine Lab Crawl, Stanford, CA 2013, 2014  
*Group presenter for medical school fundraiser*
- 49ers Academy Teaching Team, East Palo Alto, CA 2010-2015  
*Vice president, volunteer coordinator, and volunteer for middle school labs*
- SPLASH, Stanford, CA 2009, 2010  
*Instructor for one-day course on microbiology and goal-setting*

### Society memberships

American Society of Microbiology

### Other service

*Ad hoc reviewer*

- Austrian Science Fund (FWF) 2019
- Frontiers in Microbiology 2020
- ISME J 2020
- Journal of Bacteriology 2020
- PeerJ 2020
- Science<sup>§</sup> 2020
- Translational Psychiatry<sup>§</sup> 2020
- Infection and Immunity 2020

<sup>§</sup> - assistant reviewer

*Admissions committee*

- UCLA Undergraduate Research Scholars Program 2020
- Stanford Pre-Collegiate Studies 2014
- Stanford Microbiology and Immunology Graduate Program 2011-2012

## References

- Dr. Elaine Hsiao, Associate Professor  
Department of Integrative Biology and Physiology, University of California-Los Angeles  
ehsiao@g.ucla.edu
- Dr. Edward (Ned) Ruby, Professor  
Pacific Biosciences Research Center, University of Hawai‘i-Mānoa  
eruby@hawaii.edu
- Dr. Margaret McFall-Ngai, Professor and Director  
Pacific Biosciences Research Center, University of Hawai‘i-Mānoa  
mcfallng@hawaii.edu
- Dr. Justin Sonnenburg, Associate Professor  
Department of Microbiology and Immunology, Stanford University  
jsonnenburg@stanford.edu