Jeffrey Letourneau, PhD

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OBJECTIVE

I am a computational biologist with experience analyzing -omics datasets and leading human participant research studies. I am seeking a full-time industry position in late 2022 following the completion of my PhD.

EDUCATION

PhD Candidate in Molecular Genetics and Microbiology 2017-present
Duke University, Durham, NC
Thesis: Variation and stability in gut microbial ecology assessed through multi-omics time-series analysis
Advisor: Dr. Lawrence David
GPA 3.97/4.00

Bachelor of Science (BS) in Biology & Biotechnology 2013-2017
Worcester Polytechnic Institute (WPI)
GPA 3.97/4.00
Minors in Bioinformatics & Computational Biology, Spanish

SKILLS

Computational: R (tidyverse, lme4, shiny, vegan, etc.), python, Linux, microbiome data, human genomic data, 16S rRNA sequence analysis, RNA-Seq incl. metatranscriptomics, metabolomics, DADA2, QIIME2, differential abundance analysis (e.g. ALDEx2), linear models (incl. GLMs, mixed-effects models), random forest models, multitable methods, time-series analysis, high performance compute clusters (incl. AWS), containerization (Docker, Singularity)

Wet lab: DNA sequencing, anaerobic culture, bacterial cell culture, mammalian cell culture, high-performance anion exchange chromatography (HPAEC), gas chromatography (GC), confocal fluorescence microscopy, laser diffraction

Other: IRB protocol writing, clinical trial design and execution, participant recruitment, grant writing, science communication writing, designing and leading training workshops

RELEVANT EXPERIENCE

PhD Candidate, David Lab, Duke University 2018-present
Conducted independent research on the influence of day-to-day dietary variation on gut microbial ecology. Designed, executed, and led four research projects, including two IRB-approved human participant dietary intervention studies. Led project team meetings. Analyzed -omics datasets including 16S, meta-transcriptomic, and metabolomic data. Managed two pieces of analytical chemistry equipment (GC and HPAEC). Managed 16S and metagenomics pipelines, including handling transition to new compute cluster. Mentored undergraduates new to laboratory research. Presented findings at local, national, and international meetings.

Bioinformatics Consultant, Freelance 2022
Consulted, performed comparative genomic analysis on human genomic data, and developed analysis methods for private industry client. Built interactive data analysis app using R Shiny, enabling employees without coding experience to interface with the analysis pipeline.

Major Qualifying Project (MQP) Student, Rao Lab, WPI 2016-2017
Researched host-pathogen interactions between *Candida albicans* and murine macrophages. Performed *in vitro* infection assays to explore effects

of mutations in macrophage receptors and *C. albicans* virulence factors in yeast survival. Used gel electrophoresis to analyze plasmids and PCR products. Quantified levels of yeast cell wall components using modified ELISA. Trained new lab members.

Laboratory Research Assistant, Gegear Lab, WPI 2013-2016
Experimentally investigated effects of pesticides and infection in bumblebees. Trained bees on memory-based tasks and tested recall ability using foraging assays. Collected data from tests and analyzed handling times, foraging rates, and task switching. Captured, marked, and injected bees to simulate effects of bacterial infection.

INTERNSHIPS

Cell Culture Intern, AbbVie, Worcester, MA 2016

Drug Discovery and Competitive Intelligence Intern, Corbus Pharmaceuticals, Norwood, MA 2015

PUBLICATIONS

Letourneau, J., Holmes, Z. C., Dallow, E. P., Durand, H. K., Jiang, S., Carrion, V. M., Gupta, S. K., Mincey, A. C., Muehlbauer, M. J., Bain, J. R., & David, L. A. (2022). Ecological memory of prior nutrient exposure in the human gut microbiome. *The ISME Journal* 16, 2479–2490. https://doi.org/10.1038/s41396-022-01292-x

Wu, F., Ha, Y., Weiss, A., Wang, M., **Letourneau, J**., Wang, S., Luo, N., Huang, S., Lee, C. T., David, L. A., & You, L. (2022). Modulation of microbial community dynamics by spatial partitioning. *Nature Chemical Biology*. https://doi.org/10.1038/s41589-021-00961-w

Nixon, M. P., **Letourneau, J**., David, L., Mukherjee, S., & Silverman, J. D. (2022). A Statistical Analysis of Compositional Surveys. *arXiv preprint arXiv*:2201.03616.

Davey, L., Malkus, P., Villa, M., Dolat, L., Holmes, Z., **Letourneau, J.,** Ansaldo, E., David, L., Barton, G. and Valdivia, R. (2022). Mucin foraging enables Akkermansia muciniphila to compete against other microbes in the gut and to modulate host sterol biosynthesis. *Research Square preprint*. https://doi.org/10.21203/rs.3.rs-1475049/v1

FELLOWSHIPS

Graduate Research Fellowship Program (GRFP) 2019-2022

University Scholars Program (USP) Fellowship 2017-2022

Integrative Bioinformatics for Investigating and Engineering Microbiomes (IBIEM) Fellowship 2018-2019

AWARDS AND HONORS

Duke Children's Health & Discovery Initiative Scholar 2019-2020

James B. Duke Scholarship 2017-2021

WPI Provost's Award for Best Thesis in Biology Department 2017

WPI Dean's List 2013-2017

WPI Presidential Scholarship 2013-2017

WPI James R. Gorman Scholarship 2015-2017

Barry Goldwater Scholarship Honorable Mention 2016

SELECT TALKS

Ecological memory of prior nutrient exposure in the human gut microbiome, Invited talk (Zoom) at American Chemical Society 2021

	Ecological memory in the gut microbiome, Talk (Zoom) at University of North Carolina Microbiome Club	2020
	Longitudinal sampling of pH and redox in premature infants, Talk (Zoom) at Duke Children's Health Discovery Initiative	2020
	Communities of gut microbes need time to adapt before they can break down a new fiber source, Poster at Microbiome: Therapeutic Implications, Keystone Symposia, Killarney, Ireland	2019
	A metatranscriptomic approach to understanding host-mycorrhizal interactions, Poster at Duke IBIEM Poster Symposium	2019
	Human dependence on microbes, Talk at Duke University Scholars Program (USP) Symposium	2019
	Determining the roles of secreted aspartyl proteases (SAPs) and pattern recognition receptors (PRRs) in host-pathogen interactions, Poster at WPI Major Qualifying Project Symposium	2017
	Isolation and characterization of antibiotic-producing soil microbes, Poster at WPI Microbes to Molecules Poster Symposium	2017

TEACHING AND OUTREACH	**Guest Lecturer**, Alamance Community College, Alamance, NC	2021
	Panelist, Applying to Grad School Panel, Duke University	2021
	Guest Lecturer, University of Abuja, Nigeria	2020
	Pen Pal, Letters to a Pre-Scientist	2019-2020
	Classroom Assistant, Neal Middle School, Durham, NC	2018-2020
	Scientist, Skype a Scientist	2018-2020
	Teaching Assistant, Exploring the Microbiome, Duke University	2019
	Teacher, Duke Splash, Duke University	2017-2019
	Volunteer, MGM Outreach, Duke University	2017-2018
	Panelist, College Student Panel, Jordan High School, Durham, NC	2018
	Career Day Presenter, Hope Valley Elementary School, Durham, NC	2018
	Instructor, Medical Microbiology, Northeastern University	2017
	Panelist, So You Want to Go to Grad School? Panel, Duke University	2017
	Peer Advisor, Career Development Center (CDC), WPI	2016-2017
	Peer Learning Assistant, Medical Microbiology, WPI	2016

LEADERSHIP	**Duke University Scholars Program Mentor and Grad Consul**	2017-2021
	Duke MGM Department Trivia Committee	2020-2021
	Duke MGM Action Group Against Racism (AGAR)	2020-2021
	Duke Graduate Student Affairs Liaison	2019-2021
	Duke McGinnis Lecture Committee Chair and Member	2017-2020
	Duke MGM Recruitment Lead Host	2018-2019
	WPI Outing Club Treasurer and Trip Leader	2013-2017
	WPI Exploradreams Interim Vice President and Mentor	2016