

Education

University of Connecticut School of Medicine, Farmington, CT (June/2015-Present)

MD/PhD Candidate

University of Connecticut, Storrs, CT (August/2011-May/2015)

Bachelor of Sciences, Major: Pathobiology, Honors, University Scholar, *Summa cum Laude*

Bachelor of Sciences, Major: Molecular and Cell Biology, *Summa cum Laude*

GPA 3.98/4.00

Research Experience

Doctoral Research (June 2017-Present)

Jackson Laboratory for Genomic Medicine, Farmington, CT

Mentor: Julia Oh, PhD

- Genetic engineering of probiotic *Staphylococcus epidermidis* biosensor that detects the presence of *Staphylococcus aureus* via quorum-sensing pathway
- Genetic Engineering of probiotic *Staphylococcus epidermidis* to secrete heavy chain only antibodies for biologic therapeutic delivery
- Clinical implementation and computational analysis of metagenomic study of older adults
- Human skin explant and organoid modeling of skin microbiome dynamics

University Scholar/Honors Thesis (November/2013- May/2015)

“Logical Circuits for Vaccinia Virus Vectors”

University of Connecticut

Department of Pathobiology, College of Agriculture, Health and Natural Resources

Mentor: Paulo Verardi, PhD

- Independent research project to develop viral vectors with synthetic circuitry capable of Boolean logic for oncolytic viral therapies, safer vaccines immunotherapies, and gene therapies
- Designed and built genetic circuits and recombinant vaccinia virus vectors using PCR, other molecular biology, gene cloning, and virology techniques

Summer Undergraduate Research Program (SURP) (June/2014-August/2014)

“A Bile Acid-Induced Morphological Switch in Vancomycin Resistant *Enterococcus*”

Memorial Sloan-Kettering Cancer Center

Mentors: Eric Pamer, MD. Peter McKenney, PhD.

- Investigated the mechanism by which secondary bile salts inhibit the pathogenesis of multidrug resistant pathogens such as vancomycin-resistant enterococcus (VRE)
- Demonstrated that bile salts induce chaining and biofilm formation in VRE and that this occurs by activation of transcription factor SigV. Characterized this as a stochastically expressed survival mechanism of VRE analogous to persister formation.

Additional Undergraduate Research (November/2011-May/2015)

“Capturing Recombinant Vaccinia Viruses with Magnetic-Beaded Antibodies”

University of Connecticut

Department of Pathobiology, College of Agriculture, Health and Natural Resources

Mentor: Paulo Verardi, PhD

- Independent research project to develop a new method for recombinant vaccinia virus production based on cell sorting and capture

- Developed recombinant vaccinia virus susceptible to magnetic cell sorting using gene cloning, transfection, and viral culture techniques and achieved 250 fold enrichment with new sorting method

Tobacco Cessation Study (June/2012- August/2012)

St. Vincent's Hospital, Bridgeport, CT

Mentor: Keith Bradley, MD

- Enrolled and collected data from over 100 patients for the Tobacco Cessation study, a large-scale, long-term program investigating the use of tobacco by ER patients and their efforts to quit

Harbor/River Watch (November/2009-May/2011)

Earthplace, Wilton, CT

Mentor: Richard Harris

- Analyzed data in the context of seasonal and geographic conditions to evaluate local water quality and determine sources of pollution
- Collected samples from local rivers to test for water quality, tested for fecal coliform bacteria using membrane filtration
- Wrote reports on water quality to the CT government and presented at water quality seminars

Research Presentations

Larson PJ, Grady J, Kuchel GA, Robison J, Oh J. Aging and Pathogenicity Reservoirs of the Skin, Oral, and Gut Microbiome in Older Adults. ASM Microbe 2019; San Francisco, CA.

Larson PJ, Grady J, Kuchel GA, Robison J, Oh J. Skin, Oral, and Gut Microbiome Across CT Skilled Nursing Facilities. Poster Presentation at Harvard Probiotic Symposium; October 2018; Boston, MA.

Larson PJ, Guan C, Emiola A, Oh J. Engineering a Staphylococcal Biosensor Via Quorum-Sensing Circuit. Oral Presentation at ASM Microbe; June 2018; Atlanta, GA.

Larson PJ, Guan C, Emiola A, Oh J. Engineering a Staphylococcal Biosensor Via Quorum-Sensing Circuit. Poster Presentation at ASM Microbe; June 2018; Atlanta, GA.

Larson PJ, Verardi PH. Recombinase-Based Logical circuits for Vaccinia Virus Vectors. Frontiers in Undergraduate Research, University of Connecticut, April 2015.

Larson PJ, McKenney PT, Pamer E. A Bile Acid-Induced Morphological Switch in Vancomycin Resistant *Enterococcus*. Summer Undergraduate Research 2014 Poster Session, August 2014

Larson PJ. SURP Chalk Talk, Memorial Sloan Kettering Cancer Center, July 2014

Larson PJ, Verardi PH. Capturing Recombinant Vaccinia Viruses with Magnetic-Beaded Antibodies. Frontiers in Undergraduate Research, University of Connecticut, April 2014.

Larson PJ, O'Connell C, Verardi PH. Cherry-picking Recombinant Vaccinia Virus. Frontiers in Undergraduate Research, University of Connecticut, April 2013.

Larson PJ, Verardi PH. Magnetic-Beaded Antibody Facilitated Enrichment of Recombinant Vaccinia Virus Production. Frontiers in Undergraduate Research, University of Connecticut, April 2012.

Publications

McKenney P, Yan J, Vaubourgeix J, Becattini S, Lampen N, Motzer A, Larson P, Fannoui D, Xavier J, Pamer E. Reversible Morphotype Switch Mediates Adherence and Intestinal Colonization in Enterococci. Cell Host & Microbe. Apr 2019.

Larson PJ, Verardi PH. Logical Circuits for Vaccinia Virus Vectors. University Scholar Thesis. Published in UConn Digital Commons. May 2015.

Awards and Honors

- *Summa cum laude* University Scholar and Honors Graduate, University of Connecticut
- Honors Medal Ceremony Keynote Speaker, University of Connecticut, Spring 2015
- Elected to Phi Beta Kappa Honors Society, Fall 2014
- Barry M. Goldwater Scholar, 2014
- Rubin and Sarah Shaps Scholar, Gerster Sloan-Kettering, 2014
- EMT of the Year, Vista Fire Department, 2013-2014
- University Scholar, University of Connecticut, 2014
- Sophomore Honors, University of Connecticut, September 2013

Leadership Experience

American Society for Microbiology, *Young Ambassador to Connecticut* 2019

- Coordinates ASM projects and student chapters in the Connecticut Valley Region
- Campaigning to have CT name an official State Microbe
- Founded Infectious Diseases Interest Group at UConn Health

MD/PhD Steering Committee UConn Health, *Student Voting Member* 2019-2021

- One of two students selected to serve a 2-year term voting on the MD/PhD Steering committee
- Reviews and votes on student applications to the MD/PhD Program

MD/PhD Student Government UConn Health, *Founder* 2019

- Organized and founded a governing student organization for all MD/PhD students at UConn

MD/PhD Outreach Committee UConn Health, *Co-chair*. June 2016-Present

- Annual Presentations at Healthcare Opportunities Program (HCOP) minority outreach program about how and why to pursue physician-scientist training. Summers 2016-Present
- Presentation at UConn Medical Student Orientation LAUNCH Panel about the relationship between research and medicine. August 2017
- Presentations at UConn Storrs about why and how to pursue MD/PhD training
- Presentation at UConn Storrs Diversity in Medicine Panel, Spring 2017
- Develops website and marketing material
- Mentors students from underprivileged backgrounds in pursuit of physician-scientist careers

Infectious Diseases Interest Group UConn Health, *Founder, President* July 2019-Present

- Founded a pan-UConn Health Infectious Disease and Microbiology interest group bringing together medical, dental, graduate, and public health trainees.
- Organizes educational seminar, career panels, and outreach events

Hearing Committee Member UConn Graduate School. February 2018-Present. Voting member in hearing committees that address cases of academic misconduct.

Simulation Interest Group UConn Health, *Officer*, 2019-Present

- Writes and runs cases to train medical students in the management of emergent conditions in simulation lab

MD/PhD Leadership Committee UConn Health. One of two students selected to serve in the process of filling our new MD/PhD Program Co-Director and Associate Director Positions, 2017.

UConn Ballroom Dance Team University of Connecticut, Storrs, CT, *Captain*, September 2012-May 2015

Volunteer Experience

Rocky Hill Volunteer Ambulance Association, Rocky Hill, CT, *Field Training Officer, EMT*, December 2016-Present

- Practicing EMT on emergency ambulance service
- Trains new recruits in the practice of emergency medical services in the field.
- Instructs training meetings on advanced medical topics in EMS

South Park Clinic, Hartford, CT, *Medical Student Volunteer*, September 2015-Present

- Provides supervised medical assessment and treatment to homeless individuals
- Educates homeless shelter residences on health issues such as smoking cessation

Willimantic Clinic, Willimantic, CT, *Medical Student Volunteer*, September 2015-Present

- Provides supervised medical assessment and treatment to homeless individuals

Vista Fire Department, South Salem, NY, *Interior Firefighter/EMT*, July 2010-2017.

UConn School of Medicine, Farmington, CT, *Tutor*, August 2016-Present

- Tutors medical and dental students in anatomy, physiology, histopathology, pathophysiology, microbiology, and other topics

Additional Work Experience

Honors Program Office, University of Connecticut, Storrs, CT, *Student worker*, September 2011-May 2015

Belle Haven Camps, Greenwich, CT *Magic Department Chair*, summers 2010-2012

Professional Society Affiliations

2015-Present Trainee Member, American Medical Association

2019-Present Trainee Member, American Physician Scientist Association

2018-Present Young Ambassador, American Society of Microbiology

Laboratory Skills Summary:

- Microbiology: microbial isolation and identification, culturomics, MALDI-TOF, biofilm assays, bacterial genome engineering with CRISPR-Cas9, plasmid engineering, transduction, bacterial transformation
- Molecular biology: molecular cloning, Gibson Assembly, PCR, QPCR.
- Cell Biology: Mammalian cell culture, transfections, differential straining, antibody-mediated staining and cell sorting, human skin organoid microbial co-culture assays
- Biochemistry: protein purification, ELISA, western blot
- Microscopy: Fluorescence, time-lapse, confocal, ImageJ
- Virology: Cell culture infections, plaque assays, plaque purification, titration, recombinant virus generation
- Mouse Models: Intraperitoneal, intradermal, and intravenous injections, spleen/lymph node/bone marrow harvest, tumor challenges, necropsy
- Bioinformatics: 16S rRNA amplicon and metagenomic analyses
- Programming: R, Python