

Christopher A. Gaulke, Ph.D.

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Education	Doctor of Philosophy, Microbiology <i>University of California, Davis</i>	2014
	Bachelor of Science, Biology <i>Central Washington University</i>	2009
Research Experience	Research Associate <i>Oregon State University Corvallis, OR</i>	2017 -
	Postdoctoral Scholar <i>Oregon State University Corvallis, OR</i>	2014 - 2017
	Graduate Student Researcher <i>University of California, Davis Davis, CA</i>	2009 - 2014
Peer-Reviewed Publications	<ol style="list-style-type: none">22. Ezzat L, Lamy T, Maher RL, Munsterman KS, Landfield KM, Schmeltzer E, Gaulke CA, Burkepille DE, Vega Thurber R. Surgeon feces increase microbial opportunism in reef-building corals. <i>Marine Ecology Progress Series</i>, 2019, (In Press)21. Kent ML, Watral V, Gaulke CA, Sharpton TJ. Further evaluation of the efficacy of emamectin for treating <i>Pseudocapillaria tomentosa</i> (Dujardin 1843) in zebrafish <i>Danio rerio</i> (Hamilton 1822). <i>Journal of Fish Diseases</i>, 2019, 00; 1-7; doi:10.1111/jfd.13057.20. Kent ML, Watral V, Villegas EN, Gaulke CA. Viability of <i>Pseudocapillaria tomentosa</i> eggs exposed to heat, ultraviolet light, iodine, chlorine and desiccation. <i>Zebrafish</i>, 2019, 00; doi: 10.1089/zeb.2019.1736.19. Gaulke CA, Martins M, Watral V, Humphreys IR, Kent ML, Sharpton TJ. A longitudinal assessment of host-microbe-parasite interactions resolves the zebrafish gut microbiome's link to <i>Pseudocapillaria tomentosa</i> infection and pathology. <i>Microbiome</i>, 2019, 7(10); doi:10.1186/s40168-019-0622-9.18. Morelan IA, Gaulke CA, Sharpton TJ, Vega Thurber R, Denver DR. Microbiome variation in an intertidal sea anemone across latitudes and symbiotic states. <i>Frontiers in Marine Science</i>, 2019, 6(7); doi: 10.3389/fmars.2019.00007.17. Gaulke CA, Rolshoven J, Beaver LM, Barton CL, Wong C, Tanguay RL, Hudson LG, Ho E, Sharpton TJ. Marginal zinc deficiency and environmentally relevant concentrations of arsenic elicit combined effects on the gut microbiome. <i>mSphere</i>, 2018, 3(6) e00521-18; doi:10.1128/mSphere.00521-18.16. Kent ML, Sharpton TJ, Gaulke CA, Watral V. <i>Pseudocapillaria tomentosa</i> in laboratory zebrafish (<i>Danio rerio</i>): Patterns of infection and dose response. <i>Diseases of Aquatic Organisms</i>, 2018, 131:121-131; doi:10.3354/dao03286.15. Gaulke CA, Sharpton TJ. 2018. The influence of ethnicity and geography on human gut microbiome composition. <i>Nature Medicine</i>, 2018, 24(10):1495–1496; doi:10.1038/s41591-018-0210-8.14. Gaulke CA, Arnold HK, Humphreys IR, Kembel SW, O'Dwyer JP, Sharpton TJ. Ecophylogenetics Clarifies the Evolutionary Associations between Mammals and Their Gut Microbiota. <i>mBio</i>, 2018, 9(5):e01348-18. doi: 10.1128/mBio.01348-18.	

13. Wilson A[†], Watral V, Kent ML, Sharpton TJ, **Gaulke CA[#]**. Draft Genome Sequence of *Pseudomonas* sp. strain DrBHI1 (Phylum Proteobacteria). *Genome Announcements*, **2017**, 5: doi:10.1128/genomeA.01090-17.
12. Sharpton TJ, Lyalina S, Luong J, Pham J, Deal E, Armour C, **Gaulke CA**, Sanjabi S, Pollard KS. Development of Inflammatory Bowel Disease is Linked to a Longitudinal Restructuring of the Gut Metagenome in Mice. *mSystems*, **2017**, 2(5); doi:10.1128/mSystems.00036-17.
11. Romansic JM, Johnson JE, Wagner RS, Hill RH, **Gaulke CA**, Vredenburg VT, Blaustein AR. Complex interactive effects of water mold, herbicide, and the fungus *Batrachochytrium dendrobatidis* on Pacific treefrog *Hyla regilla* hosts. *Diseases of Aquatic Organisms*, **2017**, 123(3): doi:10.3354/dao03094.
10. **Gaulke CA**, Barton CL, Proffitt S, Tanguay RL, Sharpton TJ. Triclosan Exposure Is Associated with Rapid Restructuring of the Microbiome in Adult Zebrafish. *PLOS ONE*, **2016**, 11(5): e0154632. doi:10.1371/journal.pone.0154632.
9. Singletary LA, Karlinsey JE, Libby SJ, Mooney JP, Lokken KL, Tsois RM, Byndloss MX, Hirao LA, **Gaulke CA**, Crawford RW, Dandekar S, Kingsley RA, Msefula CL, Heyderman RS, Fang FC. Loss of multicellular behavior in epidemic African nontyphoidal *Salmonella enterica* serovar Typhimurium ST313 strain D23580. *mBio*, **2016**, 7(2):e02265-15. doi:10.1128/mBio.02265-15.
8. Glavan TW*, **Gaulke CA***, Santos-Rocha C, Sankaran-Walters S, Hirao LA, Raffatellu M, Jiang G, Baumler AJ, Goulart LR, Dandekar S. Gut Mucosal Dysfunction through Impaired Pattern Recognition Receptor Expression and Gut Microbiota Changes in Chronic SIV Infection. *Mucosal Immunology*, **2016**, 9, 677-688; doi:10.1038/mi.2015.92.
7. Sharpton TJ, **Gaulke CA**. Modeling the context-dependent associations between the gut microbiome, its environment, and host health. *mBio*, **2015**, 6(5):e01367-15. doi:10.1128/mBio.01367-15.
6. Glavan TW*, **Gaulke CA***, Sankaran-Walters S, Hirao LA, Raffatellu M, Baumler AJ, Goulart LR, Dandekar S. SIV Infection Driven Changes of Pattern Recognition Receptor Expression in Mesenteric Lymph Nodes and Gut Microbiota Dysbiosis. *Journal of Medical Primatology*, **2015**, 44(5), 241-252; doi:10.1111/jmp.12187.
5. Hirao LA, Grishina I, Bourry O, Hu WK, Sankaran-Walters S, **Gaulke CA**, Fenton AF, Li J, Crawford RW, Huang FC, Tarara RP, Marco ML, Baumler A, Cheng H, Dandekar S. Early Mucosal Sensing by Paneth Cells Induces IL-1 β Causing Gut Epithelial Disruption in SIV Infection. *PLOS Pathogens*, **2014**, 10(8):e1004311; doi: 10.1371/journal.ppat.1004311.
4. **Gaulke CA**, Porter M, Han Y, Sankaran-Walters S, Grishina I, George M, Dang AT, Jiang G, Ding S, Korf I, Dandekar S. Intestinal Epithelial Barrier Disruption through Altered Mucosal MicroRNA Expression in HIV and SIV Infections. *Journal of Virology*, **2014**, 88(11) 6268 - 6280; doi: 10.1128/JVI.00097-14.
3. Nagy LH, Grishina I, Macal M, Hirao LA, Hu WK, Sankaran-Walters S, **Gaulke CA**, Pollard R, Brown J, Suni M, Baumler AJ, Ghanekar S, Marco ML, Dandekar S. Chronic HIV Infection Enhances the Responsiveness of Antigen Presenting Cells to Commensal Lactobacillus. *PLOS One*, **2013**, 8(8):e72789; doi: 10.1371/journal.pone.0072789.
2. **Gaulke CA**, Wagner RS, Irwin JT. Prevalence and Distribution of *Batrachochytrium dendrobatidis* at Montane Sites in Central Washington. *Herpetological Review*, **2011**, 42, 209-211.
1. **Gaulke CA**, Wagner RS, Johnson J, Irwin JT. Northern Leopard Frogs (*Rana pipiens*) Infected with *Batrachochytrium dendrobatidis* in the Amphibian Trade. *Herpetological Review*, **2010**, 41, 322-323.

[†] Undergraduate Advisee

[#] Author of Correspondence

* Authors contributed equally to this work

Submitted Publications	Mikaelyan A, Armour CR, <u>Gaulke CA</u> , Sharpton TJ, Bordenstein SR. Do hominids cospeciate with members of the gut microbiome? (In Revision).			
	Rodrigues RR, Gurung M, Li Z, Greer R, Bauchinger F, You H, <u>Gaulke CA</u> , Vasquez-Perez S, White KD, Frink B, Jump D, Trinchieri G, Berry D, Sharpton TJ, Dzutsev A, Morgun A, Shulzhenko N. Transkingdom interactions between Lactobacilli and hepatic mitochondria attenuate western diet - induced diabetes. (Submitted).			
	Crakes KB, Rocha CS, Grishina I, Hirao LA, Napoli E, <u>Gaulke CA</u> , Fenton A, Datta S, Arredondo J, Marco ML, Sankaran-Walters S, Cortopassi GA, Giulivi C, Dandekar S. PPAR α -targeted mitochondrial bioenergetics mediate repair of intestinal barriers at the host-microbe intersection during SIV infection. (In Revision).			
Manuscripts in Preparation	<u>Gaulke CA</u> , Beaver LM, Barton CL, Wong C, Tanguay RL, Ho E, Sharpton TJ. Conserved Metagenomic and Host Gene Expression Changes in Mice and Zebrafish During Zinc Restriction.			
	<u>Gaulke CA</u> , Armour C, Sharpton TJ. A Comparative Metagenomic Analysis of Animal Models Commonly Used in Biomedical research.			
Research Funding	NIH/NIAID R21	Sharpton (PI)	\$404,250	Current
	<i>Interactions between Gut Microbiome Natural Products and Intestinal Helminths</i>			
	Goals: To determine if the gut microbiome is a factor in the etiology of helminthic intestinal infection, and to identify microbiome-sourced candidates for the discovery of novel anti-helminthic drugs.			
	Role: Co-investigator			
	NIH/OD R24 OD010998	Kent (PI)	\$1,153,615	Current
	<i>Control and Impacts of Disease of Zebrafish in Research Facilities</i>			
	Goals: The major goal of this study is to determine how research designs produce non-protocol induced variation in zebrafish, including perturbations to the gut microbiome.			
	Role: Key Personnel			
Research Funding	Oregon State University	Gaulke (PI)	\$1,000	Complete
	<i>Undergraduate Experiential Learning in Microbial Genomics</i>			
	Goals: To develop a training program in microbial genomics where undergraduates at OSU could receive hands-on research experience and to generate reference genome sequences from the zebrafish gut microbiome to facilitate functional interrogation of microbiome operation in zebrafish.			
	Role: PI			
	Oregon State University	Gaulke (PI)	\$13,000	Complete
	<i>Oregon State University Molecular and Cellular Biology Postdoc Research and Education Synthesis Award</i>			
Goals: Develop and lead a graduate level lecture and lab course on the molecular and bioinformatic techniques used to analyze human microbiome composition and function.				
Role: PI				
Teaching Experience	Guest Lecturer, The Human Microbiome (MB 436)			Apr 2019
	Department of Microbiology			
	Oregon State University			
	Contact Hours: 1h			

	Guest Lecturer, The Human Microbiome (MB 436) <i>Department of Microbiology</i> <i>Oregon State University</i> Contact Hours: 1h	June 2018
	Guest Lecturer, Mechanisms of Disease (BHS 329) <i>Department of Microbiology</i> <i>Oregon State University</i> Contact Hours: 1h	May 2018
	Instructor's Assistant, Microbiome Training Workshop <i>Oregon State University Microbiome Initiative</i> <i>Oregon State University</i> Contact Hours: 8h	May 2017
	Director, Undergraduate Research Experience in Microbial Informatics <i>Department of Microbiology</i> <i>Oregon State University</i> Contact Hours: 200h	Sept 2015 -
	Lead Instructor, Techniques in Molecular and Cellular Biology <i>Molecular and Cellular Graduate Program</i> <i>Oregon State University</i> Contact Hours: 80h	Sept 2015
	Teaching Assistant, Cell Biology, Biology for Majors Series, Introduction to Biology, and Anatomy and Physiology <i>Department of Biology</i> <i>Central Washington University</i> Contact Hours: 200h	2007 - 2009
Honors and Awards	Best Poster Award. Center for Genome Research and Biocomputing Spring Conference Phi Kappa Phi Postdoctoral Scientist Award Best Lightning Talk. Center for Genome Research and Biocomputing Spring Conference Microbiology Graduate Group Symposium Best Poster Award Honorable Mention NSF Graduate Student Research Fellowship McNair's Scholar Science Honors Fellow	Apr 2019 Apr 2019 Apr 2016 May 2013 Jan 2010 2008 - 2009 2007 - 2009
Grants and Scholarships	TerraGenome Young Scientist Travel Grant - Registration and Travel Expenses Conference on Retroviruses and Opportunistic Infections Young Investigator Award - \$1,600 Keystone Symposia Scholarship - \$1,200 Quantitative Systems Immunology Summer School Scholarship - Full tuition waiver, travel and lodging expenses	July 2017 Mar 2013 Mar 2011 July 2010
Scientific Presentations	Gaulke CA , Sharpton TJ. <i>A Zebrafish Integrated Gene Catalogue Identifies Conserved Vertebrate Microbiome Diversity and Clarifies Impacts of Zinc Deficiency on Microbiome Operation</i> . The American Society for Microbiology General Meeting, San Francisco, CA, 2019 [Poster] Gaulke CA , Sharpton TJ. <i>A Metagenomic Framework for Functional Microbiome Analysis in Zebrafish</i> . Center for Genome Research and Biocomputing Spring Conference, Corvallis, OR, 2019 [Poster]	

Gaulke CA, Sharpton TJ. *Comparative Metagenomic Analysis Identifies Conserved Genomic Diversity and Response to Perturbation in Vertebrates*. Lake Arrowhead Microbial Genomics, Lake Arrowhead, CA, 2018 **[Poster]**

Gaulke CA, Sharpton TJ. *Identification of Conserved Metagenomic Diversity and Response to Perturbation in Vertebrates*. International Symbiosis Society Congress, Corvallis, OR, 2018 **[Talk]**

Gaulke CA. *Elucidating the Impact of Micronutrient Malnutrition on Host-Microbiome Interactions*. Oregon State University Nutrition Graduate Seminar, Corvallis, OR, 2018 **[Talk]**

Gaulke CA, Armour CR, Ho E, Tanguay RL, Sharpton TJ. *Identifying Conserved Functional Diversity in Vertebrate Gut Microbiomes*. Multi-omics for Microbiomes, Pasco, WA, 2017 **[Poster]**

Gaulke CA. *From MicroRNA to the Microbiome: Host-Microbe Interactions at the Mucosal Interface*. Department of Biology Seminar, Ellensburg, WA, 2017 **[Talk]**

Gaulke CA. *Using Zebrafish to Define the Impact of Environmental Exposures on the Gut Microbiome*. Oregon State University Department of Microbiology Seminar Series, Corvallis, OR, 2017 **[Talk]**

Gaulke CA, Sharpton TJ. *Investigating the Impact of Environmental Exposures on Host Microbiome Interactions*. Oregon State University Department of Microbiology Artist Workshop, Corvallis, OR, 2016 **[Talk]**

Gaulke CA, Arnold H, Sharpton TJ. *An Ecophylogenetic Approach to Determine the Evolutionary History of the Mammalian Gut Microbiome*. Meeting of the International Society of Microbial Ecologists, Montreal, Quebec Canada, 2016 **[Poster]**

Gaulke CA, Beaver LM, Barton CL, Tanguay RL, Ho E, Sharpton TJ. *A Comparative Analysis of the Gut Metagenome's Response to Dietary Zinc Restriction in Zebrafish and Mice*. Meeting of the International Society of Microbial Ecologists, Montreal, QC Canada, 2016 **[Poster]**

Gaulke CA, Beaver LM, Barton CL, Wong CP, Tanguay RL, Ho E, Sharpton TJ. *Comparative Metagenomic Analysis of Zebrafish and Mice Exposed to Dietary Zinc Restriction*. Microbial Ecology and Theory of Animals Annual Meeting, Eugene, OR, 2016 **[Poster]**

Gaulke CA, Beaver LM, Barton CL, Tanguay RL, Ho E, Sharpton TJ. *Dietary Zinc Restriction Alters Microbiome Structure and Function in Adult Zebrafish*. Oregon State University Environmental Health Sciences Colloquium, Corvallis, OR, 2016 **[Talk]**

Gaulke CA, Beaver LM, Barton CL, Tanguay RL, Ho E, Sharpton TJ. *Restriction of Dietary Zinc and its Impact on the Structure and Function of the Gut Microbiome of Adult Zebrafish*. The American Society for Microbiology General Meeting, Boston, MA, 2016 **[Poster]**

Gaulke CA, Sharpton TJ. *An Ecophylogenetic Approach to Determine the Evolutionary History of the Mammalian Gut Microbiome*. The American Society for Microbiology General Meeting, Boston, MA, 2016 **[Poster]**

Gaulke CA. *Developing the Zebrafish as a High-Throughput Model of Interactions between Hosts, their Microbiomes and the Environment*. Center for Genome Research and Biocomputing Spring Conference, Corvallis, OR, 2016 **[Talk]**

Gaulke CA, Barton CL, Watral VG, Proffitt S, Kent ML, Tanguay RL, Sharpton TJ. *The Zebrafish as a Model of the Interactions between Microbial Communities, their Hosts, and the Environment*. Microbial Ecology and Theory of Animals Annual Meeting, Eugene, OR, 2015 **[Poster]**

Gaulke CA, Barton C, Watral VG, Proffitt S, Kent ML, Tanguay RL, Sharpton TJ. *The Zebrafish as a Model of Host-Microbiome-Environment Interactions*. The American Society for Microbiology General Meeting, New Orleans, LA, 2015 **[Poster]**

Gaulke CA. *Zebrafish as a Model for High-Throughput Analyses of Microbial Interactions with their Hosts and the Environment*. Oregon State University Department of Microbiology Seminar, Corvallis, OR, 2015 **[Talk]**

Gaulke CA, Porter M, Han YH, Sankaran-Walters S, Grishina I, George MD, Dang AT, Ding S, Korf I, Dandekar S. *SIV Induced Disruption of MicroRNA Expression in the Small Intestine Contributes to Epithelial Barrier Dysfunction*. Keystone HIV Pathogenesis, Banff, AB Canada, 2014 **[Talk]**

Gaulke CA, Porter M, Grishina I, Fass J, Joshi NA, Jovel J, Ding S, Lin D, George MD, Korf I, Dandekar S. *AIDS Virus Associated Gut Epithelial Barrier Dysfunction Is Induced by Mucosal microRNA Dysregulation*. The Conference on Retroviruses and Opportunistic Infections (CROI), Atlanta, GA, 2013

[Poster]

Gaulke CA, Grishina I, Fass J, Joshi NA, Jovel J, Ding S, Lin D, Dandekar S. *Gut Epithelial Barrier Disruption in Retrovirus Infection through MicroRNA Dysregulation*. The Host Microbe Interaction Conference, Tahoe City, CA, 2012 **[Talk]**

Gaulke CA, Grishina I, Fass J, Joshi NA, Jovel J, Ding S, Lin D, Dandekar S. *Rapid Gut Mucosal Response to SIV and Co-infections is Mediated through the Modulation of MicroRNA Expression*. Keystone HIV Evolution, Genomics and Pathogenesis, Whistler, BC Canada, 2011 **[Poster]**

Gaulke CA, Johnson J, Wagner RS, Irwin JT. *High Infection Rates of the Fungus Batrachochytrium dendrobatidis in Biological Supply and Wild-Caught Frogs in Central Washington State*, USA. The Society for Integrative and Comparative Biology Annual Meeting, Boston, MA, 2009 **[Poster]**

Gaulke CA, Johnson J, Wagner RS, Irwin JT. *Pathophysiology of Batrachochytrium dendrobatidis*. The Society for Northwestern Vertebrate Biology Annual Meeting, Victoria, BC Canada. 2007 **[Talk]**

**Other
Presentations**

Gaulke CA. *Navigating Academia as a First Generation College Graduate*. Central Washington University's Annual McNair Scholar Graduation Recognition Dinner, Ellensburg, WA, 2017 **[Keynote Speaker]**

**Professional
Affiliations**

American Society for Microbiology
American Association for the Advancement of Science

**Academic
Service**

Organizer, Undergraduate Research Seminar Series	2017 - 2018
<i>Oregon State University, Department of Microbiology</i>	
Journal Referee	2015 -
<i>Journal of Virology, PLOS One, Nucleic Acid Research, Genes, Brains and Behavior, Aquaculture Research</i>	
Graduate Admissions Committee	2013 - 2014
<i>University of California, Davis, Microbiology Graduate Group</i>	
Graduate Representative to Graduate Student Senate	2010 - 2012
<i>University of California, Davis, Microbiology Graduate Group</i>	

**Diversity
Outreach**

Ad hoc Central Washington University McNair Scholar Student Advisor	2009 -
<i>Central Washington University</i>	
McNair Scholar Orientation Roundtable Participant	Oct 2009
<i>University of California, Davis</i>	

**Specialized
Training**

Next Generation Sequencing Library Preparation Workshop	2012
<i>University of California, Davis, Davis CA</i>	
Bioinformatics Short Course	2010
<i>University of California, Davis, Davis CA</i>	
Quantitative Systems Immunology Summer School	2010
<i>San Antonio, TX</i>	

Selected

"Why everyone's suddenly talking about gut bacteria"	June 2016
<i>Fortune Magazine</i>	

Scientific Press	<i>Laura Entis</i>	
	“The case against antibacterial soap is getting stronger”	May 2016
	<i>Time</i>	
	<i>Alexandra Sifferlin</i>	
	“Mounting data suggest antibacterial soaps do more harm than good”	April 2016
	<i>Ars Technica</i>	
	<i>Beth Mole</i>	
Undergraduates Mentored	Zoe Vanderhoek	2019 -
	Addison Browning	2019 -
	Mary Katherine English	2018 - 2019
	Alexandra Wilson	2015 - 2018
	Annabelle Thorniley	2015 - 2016
	Holman Jue	2014 - 2015
	Kelsey Birtcher	2013 - 2014
	Keyon Taravati	2012 - 2013
	Andrew Tremain	2012 - 2013
	Jay Li	2011 - 2014
	Anne Fenton	2011 - 2014
	Larissa Goulart	2011 - 2013
	Steve Bouman	2011 - 2012
Graduate Students Mentored	Grace Deitzler (<i>Ph.D Department of Microbiology, OSU</i>)	2018 - 2019
	Ian Humphreys (<i>M.S. Department of Microbiology, OSU</i>)	2017 - 2019
	Quinn Washburn (<i>Ph.D Department of Microbiology, OSU</i>)	2017 -
	Holly Arnold (<i>DVM, Ph.D Department of Microbiology, OSU</i>)	2016 -
	John Rolshoven (<i>M.S. Molecular and Cellular Biology Graduate program, OSU</i>)	2015 - 2017
	Melissa Conley (<i>Ph.D Department of Nutrition, OSU</i>)	2014 - 2017
	Nicole Kirchoff (<i>Ph.D Department of Microbiology, OSU</i>)	2014 -
	Courtney Armour (<i>Ph.D Molecular and Cellular Biology Graduate program, OSU</i>)	2014 -
	Andrew Esterson (<i>M.S. Department of Crop and Soil Sciences, OSU</i>)	2014 - 2016
	Ian Morelan (<i>Ph.D Molecular and Cellular Biology Graduate program, OSU</i>)	2014 - 2019
	Maher Elsheikh (<i>Ph.D Department of Microbiology, UC Davis</i>)	2013 - 2014