

# Christopher A. Gaulke, Ph.D.

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## EDUCATION

- Doctor of Philosophy, Microbiology** 2014  
University of California Davis
- Bachelor of Science, Biology** 2009  
Central Washington University

## RESEARCH EXPERIENCE

### Oregon State University, Corvallis, OR

*Post Doctoral Scholar, Advisor: Thomas Sharpton, 2014 - Present*

- Developed a framework for use of zebrafish as a high-throughput model of host-microbiome-environment interactions
- Interrogated the impacts of environmental toxicants, dietary micronutrients, and pathogens on the structure and function of the microbiome and host physiology.
- Designed software to investigate patterns of codiversification of microbiomes with their hosts.
- Established an undergraduate training program in bioinformatics.

### University of California Davis, Davis, CA

*Graduate Student; Advisor: Satya Dandekar 2009 - 2014*

Breaking the mucosal barrier: Investigating the role of microRNA in the disruption of the intestinal epithelial barrier during SIV infection.

- Analyzed intestinal microRNA expression using small-RNAseq, real-time PCR and microRNA microarrays.
- Localized mucosal microRNA loss during infection to intestinal epithelial cells with laser capture microdissection.
- Used western blot and immunoprecipitation to quantify SIV induced alterations in microRNA processing machinery.
- Sequenced 16S rRNA libraries and examined correlations between mucosal microRNA loss, cytokine expression and alterations in intestinal microbiota during SIV infection.

### Central Washington University, Ellensburg, WA

*Undergraduate Researcher; Advisor: Jason Irwin, 2006 - 2009*

Examination of pathophysiology and prevalence of *Batrachochytrium dendrobatidis* (chytrid) in Central Washington State.

- Analyzed the effects of chytrid infection on amphibian metabolism and electrolyte balance using flow-through respirometry and measuring osmolality.
- Identified widespread chytrid infection in frogs used in the amphibian trade.
- Conducted mark and recapture studies to investigate the prevalence of the *Batrachochytrium dendrobatidis* at montane sights in Central Washington State.

## PEER-REVIEWED PUBLICATIONS

1. **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](https://doi.org/10.1371/journal.pone.0154632)

2. Singletary LA, Karlinsey JE, Libby SJ, Mooney JP, Lokken KL, Tsohis 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
3. Glavan TW\*, **Gaulke CA\***, Santos-Rocha C, Sankaran-Walters S, Hirao LA, Raffatellu M, Jiang G, Baumler AJ, Goulart LR, and 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
4. Sharpton TJ, **Gaulke CA**. 2015. 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
5. Glavan TW\*, **Gaulke CA\***, Sankaran-Walters S, Hirao LA, Raffatellu M, Baumler AJ, Goulart LR, and 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
6. 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 $\beta$  Causing Gut Epithelial Disruption in SIV Infection. *PLoS Pathogens*, **2014**, 10(8):e1004311
7. **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
8. 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
9. **Gaulke CA**, Wagner RS, Irwin JT. Prevalence and Distribution of *Batrachochytrium dendrobatidis* at Montane Sites in Central Washington. *Herpetological Review*, **2011**, 42, 209-211
10. **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

\* Authors Contributed equally to this work.

## SCIENTIFIC PRESENTATIONS

- 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. American Society for Microbiology General Meeting, Boston, Massachusetts, 2016 [**Poster**]
- Gaulke CA**, Sharpton TJ. An Ecophylogenetic Approach to Determine the Evolutionary History of the Mammalian Gut Microbiome. American Society for Microbiology General Meeting, Boston, Massachusetts, 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, Oregon, 2016 [**Talk**]
- Gaulke CA**, Barton C, Watral V, Proffitt S, Kent M, Tanguay R, Sharpton TJ. The Zebrafish as a Model of Host-Microbiome-Environment Interactions. The American Society for Microbiology General Meeting, New Orleans, Louisiana, 2015 [**Poster**]

**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, Alberta 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]

### INVITED PRESENTATIONS

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

### HONORS AND AWARDS

Oregon State University Molecular and Cellular Biology Postdoc Research and Education Synthesis award, **2016**  
Best Lightning Talk. Center for Genome Research and Biocomputing Spring Conference, **2016**  
Oregon State University Postdoctoral Association Professional Development Award, **2015**  
Conference on Retroviruses and Opportunistic Infections Young Investigator Award, **2013**  
Keystone Symposia Scholarship, **2011**  
Quantitative Systems Immunology Summer School Scholarship, **2010**  
Honorable Mention NSF Graduate Student Research Fellowship, **2010**

### PROFESSIONAL AFFILIATIONS

**American Society for Microbiology**  
**American Association for the Advancement of Science**

### SERVICE

**University California Davis Microbiology Graduate Group Admissions Committee**, 2013-2014

- Reviewed graduate admission application materials and interviewed perspective students.

**University California Davis Graduate Student Association**, 2010-2012

- Served as the microbiology graduate group student representative to the U.C. Davis graduate student association.

## TECHNICAL TRAINING

**Next Generation Sequencing Library Preparation Workshop**, Spring 2012

University California Davis, Davis California

**Bioinformatics Short Course**, Fall 2010

University of California Davis, Davis California

**Quantitative Systems Immunology Summer School**, 2010

San Antonio, Texas