

# Christopher M. Whidbey, Ph.D.

Assistant Professor · Department of Chemistry · Seattle University

## Curriculum Vitae

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### Education

- Ph.D. Pathobiology, University of Washington, 2015  
Dissertation: Characterization of the Group B Streptococcus Hemolysin and its Role in Intrauterine Infection
- B.A. Chemistry and Biology, Seattle University, 2010
- B.A. Philosophy with Departmental Honors, Seattle University, 2010

### Appointments

- 2018-Present Assistant Professor, Department of Chemistry, Seattle University
- 2015-2018 Postdoctoral research in chemical biology, Pacific Northwest National Laboratory  
Mentor: Aaron Wright
- 2010-2015 Graduate research in host-pathogen interaction, University of Washington  
Mentor: Lakshmi Rajagopal
- 2009-2010 Undergraduate research in environmental analytic chemistry, Seattle University

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### Select Publications

#### Peer-Reviewed Journal Articles

- 2022 B. Killinger<sup>1</sup>, **C. Whidbey**<sup>1</sup>, A. DeLeon, Y.M. Kim, and A. Wright. Activity-based profiling of carbohydrate active enzymes in the gut microbiome induced by high or low fiber diets. *npj Biofilms and Microbiomes*. **2022**, 8:60.
- 2021 K.R. Brandvold, C Miller, R. Volk, B. Killinger, **C. Whidbey**, and A. Wright. Activity-based profiling of bile salt hydrolysis with beta-lactam or acrylamide-based probes. *ChemBioChem*. **2021**, 22(8):1448-1455
- 2020 B. Armistead, P. Herrero-Foncubierta, M. Coleman, P. Quach, **C. Whidbey**, J. Justicia, R. Tapia, R. Casares, A. Millán, A. Haidour, J. Rodriguez Granger, J. Vornhagen, V. Santana-Ufret, S. Merillat, K. Adams Waldorf, J.M. Cuerva, and L. Rajagopal. Lipid analogs reveal features critical for hemolysis and diminish granadaene mediate Group B Streptococcus infection. *Nature Communications*. **2020**, 11(1):1-12.
- 2019 B. Armistead, **C. Whidbey**, L. Iyer, P. Herrero-Foncubierta, P. Quach, A. Haidour, L. Aravind, J.M. Cuerva, H. Jaspan, and L. Rajagopal. The *cyl* genes reveal the biosynthetic and evolutionary origins of the Group B Streptococcus hemolytic lipid, Granadaene. *Frontiers in Microbiology*, **2019**, 11.
- 2019 K. Brandvold, J. Weaver, **C. Whidbey**, and A. Wright. A continuous fluorescence assay for simple quantification of bile salt hydrolase activity in the gut microbiome. *Scientific Reports*, **2019**, 9(1):1359.
- 2018 **C. Whidbey**, N. Sadler, R. Nair, R. Volk, A. DeLeon, L. Bramer, S. Fansler, J. Hansen, A. Shulka, J. Jansson, B. Thrall, and A. Wright. A probe-enabled approach for the selective isolation and characterization of functionally active subpopulations in the gut microbiome *Journal of the American Chemical Society*, **2018**, 141(1): 42-47.
- 2018 J. Vornhagen, B. Armistead, P. Quach, V. Santana-Ufret, E. Boldenow, V. Alishetti, C. Melief, L. Ngo, **C. Whidbey**, K. Doran, C. Curtis, E. Nance, and L. Rajagopal. Group B

- streptococcus exploit epithelial cell exfoliation for ascending infection. *Journal of Clinical Investigation*. **2018**, 128(5): 1985-1999.
- 2018 C. Gendrin, J. Vornhagen, B. Armistead, P. Singh, **C. Whidbey**, S. Merillat, D. Knupp, R. Parker, L. Rogers, P. Quach, L. Iyer, L. Aravind, S. Manning, D. Aronoff, and L. Rajagopal. A nonhemolytic group B streptococcus strain exhibits hypervirulence. *The Journal of Infectious Diseases*. **2017**, 217(6): 983-987.
- 2016 E. Boldenow, C. Gendrin, L. Ngo, C. Bierle, J. Vornhagen, M. Coleman, S. Merillat, B. Armistead, **C. Whidbey**, V. Alishetti, V. Santana-Ufret, J. Ogle, M. Gough, S. Srinouanprachanh, J. MacDonald, T. Bammler, A. Bansal, H.D. Liggitt, L. Rajagopal, and K.M. Adams-Waldorf. Group B Streptococcus circumvents neutrophils and neutrophil extracellular traps in the placenta during amniotic cavity invasion and preterm labor. *Science Immunology*, **2016**, 1: eaah4576.
- 2016 J. Vornhagen., P. Quach, E. Bodenow, S. Merillat, **C. Whidbey**, L.Y. Ngo, K.M. Adams-Waldorf, and L. Rajagopal. Bacterial hyaluronidase promotes ascending GBS infection and preterm birth. *mBio*, **2016**, 7(3):e00781-16.
- 2015 **C. Whidbey**, J. Vornhagen, C. Gendrin, E. Boldenow, J.M. Samson, K. Doering, L. Ngo, E.A.D. Ezekwe Jr., J. Gundlach, M. Elovitz, D. Liggitt, J.A. Duncan, K. Adams-Waldorf, and L. Rajagopal. A streptococcal lipid toxin induces membrane permeabilization and pyroptosis leading to fetal injury. *EMBO Molecular Medicine*, **2015**, 7(4):488-505.
- 2015 **C. Whidbey**<sup>1</sup>, K. Burnside<sup>1</sup>, R. Martinez, C. Gendrin, J. Vornhagen, A. Frando, M. Harrell, R. McAdams, and L. Rajagopal. A hyperhemolytic/hyperpigmented Group B Streptococcus strain with a CovR mutation isolated from an adolescent patient with Sore Throat. *Clinical Research in Infectious Disease*, **2015**, 2(2):1018.
- 2015 J. Vornhagen<sup>1</sup>, K. Burnside<sup>1</sup>, **C. Whidbey**<sup>1</sup>, J. Berry., X. Qin, and L. Rajagopal. Kinase inhibitors that increase the sensitivity of methicillin resistant *Staphylococcus aureus* to  $\beta$ -lactam antibiotics. *Pathogens*, **2015**, 4(4):708-21.
- 2015 C. Gendrin, J. Vornhagen, L. Ngo, **C. Whidbey**, E. Boldenow, V. Santana-Ufret, M. Clauson, K. Burnside, D. Galloway, K. Adams-Waldorf, A. Piliponsky, and L. Rajagopal. Mast cell degranulation by a hemolytic lipid toxin decreases GBS colonization and infection. *Science Advances*, **2015**, 1(6):e1400225.
- Featured in 'This Week in Science': *Science*, **2015**, 349(6245):279-80.
- 2015 C. Gendrin, A. Lembo, **C. Whidbey**, K. Burnside, J. Berry, L. Ngo, A. Banerjee, X. Liang, J. Arrington, K.S. Doran, W.A. Tao, and L. Rajagopal. The sensor histidine kinase RgfC affects Group B Streptococcal virulence factor expression independent of its response regulator RgaA. *Infection and Immunity*, **2015**, 83(3):1078-88.
- 2013 **C. Whidbey**<sup>1</sup>, M. Harrell<sup>1</sup>, K. Burnside, L. Ngo, A. Becraft, L. Iyer, L. Aravind, J. Hitti, K. Adams-Waldorf, and L. Rajagopal. A hemolytic pigment of Group B Streptococcus allows bacterial penetration of human placenta. *Journal of Experimental Medicine*, **2013**, 210:1265-1281.
- 2012 **C. M. Whidbey**, K. E. Daumit, T. H. Nguyen, D. D. Ashworth, J. C. Davis, D. E. Latch. Photochemical induced changes of *in vitro* estrogenic activity of steroid hormones. *Water Research*, **2012**, 46(16):5287-96.

<sup>1</sup>Equal Contribution

#### Book Chapters

- 2020 A. Steiger, S. Fansler, **C. Whidbey**, C. Miller, and A. Wright. Probe-enabled approaches for function-dependent cell sorting and characterization of microbiome subpopulations. *Methods in Enzymology*. 2020 ;638:89-107. DOI: 10.1016/bs.mie.2020.03.014.
- 2019 **C. Whidbey** and A Wright. Activity-Based Protein Profiling – Enabling Multimodal Functional Studies of Microbial Communities. In: Cravatt B., Hsu KL., Weerapana E. (eds) Activity-Based Protein Profiling. Current Topics in Microbiology and Immunology, vol 420. Springer, Cham

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**Patents**

- 2018 A. Wright, **C. Whidbey**, K. Brandfold, T. Murphree, J. Weaver. Bile Salt Hydrolase Activity Based Assay for Protein Profiling. Patent Application 16/151,170.
- 2013 L. Rajagopal, K. Burnside, **C. Whidbey**. Kinase inhibitors capable of increasing the sensitivity of bacterial pathogens to  $\beta$ -lactam antibiotics. PCT/US2012/050635.

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**Presentations**

## Invited Presentations

- 2017 **C. Whidbey**, N. Sadler, R. Nair, L. Bramer, S. Fansler, J. Hansen, J. Jansson, B. Thrall, and A. Wright. Activity-dependent isolation and characterization of xenobiotic metabolizing microbes in the gut microbiome. Center for Infectious Disease Research, Seattle WA, November 2017.
- 2016 **C. Whidbey**, N. Sadler, and A. Wright. A multi-omic approach to characterizing functional changes in the microbiome using activity-based probes. Society for Industrial Microbiology and Biotechnology, New Orleans, LA, July 2016.
- 2013 **C. Whidbey**. A Lipid Toxin and Perinatal Disease: Mechanisms of Group B Streptococcus Pathogenesis. Seattle University Natural Science Seminar Series, Seattle, WA, November 2013.

## Oral Presentations

- 2012 **C. Whidbey**, M. Harrell, K. Adams-Waldorf, L. Rajagopal. Penetration of Human Placenta by Group B Streptococci. Northwest Branch Meeting of the American Society for Microbiology, Seattle, WA, November 2012.
- 2012 **C. Whidbey**, M. Harrell, K. Adams-Waldorf, L. Rajagopal. Penetration of Human Placenta by Group B Streptococci. International Conference for Gram Positive Pathogens, Omaha, NE, October 2012.
- 2010 **C. M. Whidbey**, T. H. Nguyen, K. E. Daumit, J. A. Loertscher, D. E. Latch, J. L. Gray. Environmental photochemistry of estrogenic endocrine-disrupting compounds: kinetics and assessment of photodegradate potency. NCUR, Missoula, MT, April 2010.
- 2010 **C. M. Whidbey**, T. H. Nguyen, K. E. Daumit, J. A. Loertscher, D. E. Latch, J. L. Gray. Environmental photochemistry of estrogenic endocrine-disrupting compounds: kinetics and assessment of photodegradate potency. ACS National Meeting, San Francisco, CA, March 2010.

## Poster Presentations

- 2019 **C. Whidbey**, B. Killinger, G. Clair, Y.M. Kim, and A. Wright. Multi-omic characterization of dietary fiber degradation in the gut microbiome. Multi-omics for Microbiomes Conference. Richland, WA, July 2019.
- 2016 **C. Whidbey**, N. Sadler, and A. Wright. Activity-based analysis of glucuronidation reactions at the gut host-microbe interface. Keystone Symposium: Gut Microbiota, Metabolic Disorders, and Beyond. Newport, RI, April 2016.
- 2015 **C. Whidbey**, N. Sadler, B. Thrall, and A. Wright. Proteomic and cytometric analysis of microbial community function using activity-based probes. Multi-omics for Microbiomes Conference. Kennewick, WA, September 2015.
- 2014 **C. Whidbey**, E. Boldenow, J. Vornhagen, L. Rajagopal. Biochemical characterization of the ornithine rhamnolipid pigment of group B streptococcus and its interaction with host cells. XIX Lancefield International Symposium on Streptococci, Buenos Aires, Argentina, November 2014.
- 2013 **C. Whidbey**, L. Ngo, K. Adams-Waldorf, L. Rajagopal. A mouse model of Group B Streptococcal associated preterm birth. International Conference for Gram Positive Microorganisms, Montecatini Terme, Italy, June 2013.
- 2009 **C. M. Whidbey**, K. E. Daumit, C. N. Goodwin, D. E. Latch. Solar degradation of

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endocrine-disrupting contaminants. ACS Puget Sound Section Undergraduate Research Symposium, University of Puget Sound, Tacoma, WA, May 2009.

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## Research Grants and Funding

### External Research Funding

2020-2023	MJ Murdock College Research Program for Natural Sciences. NS-201913756	\$60,000
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## Teaching

### *At Seattle University*

CHEM 1500 (General Chemistry I), CHEM 3600 (Introductory Biochemistry), CHEM 4600 (Advanced Enzymology) CHEM 4610 (DNA Methods and Analysis), CHEM 1501 (General Chemistry Laboratory I), CHEM 1511 (General Chemistry Laboratory II), CHEM 4990 (Undergraduate Research).

### *Prior to Seattle University*

General Microbiology, Washington State University Tri-Cities, Richland WA, 2017.  
General Biochemistry I, Washington State University Tri-Cities, Richland WA, 2016-2018.  
General Microbiology Laboratory, Washington State University Tri-Cities, Richland WA, 2017.  
Introduction to Microbiology, Washington State University Tri-Cities, Richland WA, 2016.

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## Scholarships and Fellowships

2020	Fellow, Research Corporation Scialog: Microbiome, Neurobiology, and Disease.
2014	Research Supplement to Promote Diversity in Health-Related Research (NIH Administrative Supplement R01-AI100989-03S1)
2014	University of Washington GO-MAP Presidential Fellowship (Year 2)
2011	Predocctoral Fellowship, Public Health Diseases, 2011-2103 (NIH Training Grant T32-AI7509)
2010	University of Washington GO-MAP Presidential Fellowship (Year 1)

## Honors and Awards

2022	Seattle University College of Science and Engineering Outstanding Teacher Award
2016	Department of Energy Early Career Development Travel Award
2010	American Chemical Society Undergraduate Student Award
2010	Seattle University John S. Ju Award
2009	Seattle University Bannan Scholarship

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## Service

### *External Service*

- Ad hoc Manuscript Reviewer
  - mSphere; Infection, Genetics & Evolution; Gut Microbes

### *Internal Service*

- Chemistry Department
  - Seminar Series Coordinator (2018-Present)
- College of Science and Engineering
  - Faculty Senate (2022-Present)
- Seattle University
  - Member, Academic Calendar Review Committee (2020-Present)