

KYLIE D. ALLEN, Ph.D.
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EDUCATION

- 2013-2015 **Postdoctoral** Biochemistry, Virginia Tech, Blacksburg, VA.
- 2008-20013 **Ph.D.** Biochemistry, Washington State University, Pullman, WA.
- 2003-2007 **B.S.** Biology, Eastern Washington University, Cheney, WA.

PROFESSIONAL EXPERIENCE

- 2015-present **Assistant Professor of Chemistry and Biochemistry:** Gonzaga University, Spokane, WA

- 2013-2015 **Postdoctoral Research Associate:** Virginia Tech, Blacksburg, VA. Advisor: Dr. Robert H. White

Projects involved characterization of modified coenzymes and new metabolites in methanogenic archaea, biosynthetic pathway determination, and identification/mechanistic investigation of enzymes involved. Supervised and trained four undergraduate students, organized lab meetings, lab safety compliance manager, assisted PI in all aspects of lab management.

- 2008-2013 **Graduate Research and Teaching Assistant:** Washington State University, Pullman, WA. Advisor: Dr. Susan Wang, School of Molecular Biosciences

Projects involved *In vitro* investigation of cobalamin-dependent radical S-adenosyl-L-methionine methyltransferases involved in phosphonate antibiotic biosynthesis, used biochemical and spectroscopic techniques to demonstrate enzymatic activity and obtain mechanistic information, characterization of the iron-sulfur cluster required for activity.

- 2011 **Enology Internship:** E.J. Gallo Winery, Modesto, CA, Supervisor: Dr. Chandra Richter, Enology Scientist

Designed primers and developed real-time polymerase chain reaction (RT-PCR) experiments for rapid detection of spoilage microbes in winemaking; Monitored microbial populations during pinot noir cold soak using RT-PCR; Trained others for implementation of RT-PCR protocol; Assessed activity of a β -1,3-glucanase enzyme in white and red wine.

2007 **Undergraduate Teaching Assistant:** Eastern Washington University, Cheney, WA, Supervisor: Dr. Sydney Kasuga

Medical Bacteriology Lab (Biol 335)
Prepared lectures and explained lab procedures, lead/only teaching assistant for two lab sections

HONORS and AWARDS

2003-2005 Presidential Scholarship, Eastern Washington University

GRANTS

Current support

2017-2020 M.J. Murdock Charitable Trust, "Investigating the Function and Biosynthesis of a Coenzyme F₄₃₀ Variant from Methanogenic Archaea: Implications for Alternative Fuels and Climate Change" Total amount: \$55,700

Previous support

2012-2013 Poncin Bank of America Fellowship Award, 100% graduate student stipend and travel funds

2009-2011 NIH Protein Biotechnology Training Grant, 100% graduate student stipend and travel funds

PUBLICATIONS

1. **Allen, K.** and White, R. (2016) Occurrence and biosynthesis of 3-mercaptopropionic acid in *Methanocaldococcus jannaschii*. *FEMS Microbiology letters* 363, fnw217.
2. **Allen, K.**, Miller, D., Rauch, B., Perona, J., and White, R. (2015) Homocysteine is biosynthesized from aspartate semialdehyde and hydrogen sulfide in methanogenic archaea, *Biochemistry* 54, 3129-3132.
3. Feirer, N., Xu, J., **Allen, K.**, Koestler, B., Waters, C., White, R., and Fuqua, C. (2015) A Pterin-Dependent Signaling Pathway Regulates a Dual Function Diguanylate Cyclase-Phosphodiesterase Protein Controlling Surface Attachment in *Agrobacterium tumefaciens*, *mBio*, 6(4).
4. Hu, K., Werner, W., **Allen, K.**, Wang, S. (2015) Single Quantum and Multiple Quantum HCP Nuclear Magnetic Resonance Experiments Demonstrate C-P Bond Formation by PhpK from *Kitasatospora phosalacinea*, *Magnetic Resonance in Chemistry* 53, 267-272.
5. **Allen, K.**, and White, R. (2014) Identification of structurally diverse methanofuran coenzymes in Methanococcales that are both N-formylated and N-acetylated, *Biochemistry* 53, 6199–6210.

6. **Allen, K.**, and Wang, S., (2014) Spectroscopic characterization and mechanistic investigation of P-methyl transfer by a radical SAM enzyme from the marine bacterium *Shewanella denitrificans* OS217, *Biochimica et Biophysica Acta*. 1844, 2135-2144.
7. **Allen, K.**, Wegner, G., and White, R. (2014) Discovery of multiple modified F430 coenzymes in methanogens and anaerobic methylotrophic archaea suggests new roles for F430 in Nature. *Applied and Environmental Microbiology* 80, 6403-6412. **(Spotlight Article)**
8. **Allen, K.**, Xu, H., and White, R. (2014) Identification of a unique radical SAM methyltransferase likely involved in methanopterin biosynthesis in *Methanocaldococcus jannaschii*, *Journal of Bacteriology* 196, 3315-3323. **(Selected by Faculty of 1000)**
9. **Allen, K.**, and Wang, S. (2014) Initial Characterization of Fom3 from *Streptomyces wedmorensis*: The Methyltransferase in Fosfomycin Biosynthesis, *Archives of Biochemistry and Biophysics* 543, 67-73.
10. Werner, W*., **Allen, K***., Hu, K., Helms, G., Chen, B., and Wang, S. (2011) In Vitro Phosphinate methylation by PhpK from *Kitasatospora phosalacinea*, *Biochemistry* 50, 8986-8988.
*Contributed equally

POSTER PRESENTATIONS WITH GONZAGA STUDENTS

(GU students are underlined)

1. Byquist, S., and Allen, K. Radical Enzymes Involved in Compatible Solute Biosynthesis in Methanogens. Poster presented at the Murdock College Science Research Program Regional Conference on Undergraduate Research, 2016 November 4-5, Spokane, WA.
2. Brandecker, K., Thiaville, J., de Crecy Lagard, V., Allen, K. Investigation of a Novel Route for para-Aminobenzoic acid Biosynthesis in Chlamydia. Poster presented at Fall Family Weekend, Gonzaga University, 2016 October 8, Spokane, WA.
3. DePledge, L., Ferier, N., Fuqua, C., Allen, K. Characterization of a Novel Enzyme Involved in Biofilm Regulation. Poster presented at Fall Family Weekend, Gonzaga University, 2016 October 8, Spokane, WA.

OTHER POSTER PRESENTATIONS

National

1. **Allen, K.** and White, R. A new route for methionine biosynthesis in methanogens. Poster presented at: Enzymes, Coenzymes, and Metabolic Pathways Gordon Research Conference; 2015 June 14-19; Waterville Valley, NH.
2. **Allen, K.**, Xu, H., and White, R. Identification of a unique radical SAM methyltransferase likely involved in methanopterin biosynthesis in *Methanocaldococcus jannaschii*. Poster presented at: Iron-Sulfur Enzymes Gordon Research Conference; 2014 June 15-24; Easton, MA.

3. **Allen, K.**, Hu, K., Helms, G., Wang, S. SD1168 from *Shewanella denitrificans* is an Unexpected P-methyltransferase. Poster presented at: Protein Cofactors, Radicals and Quinones Gordon Conference; 2012 Jul 29- Aug 3; South Hadley, MA.
4. **Allen, K.**, DeLine, M., Wang, S. Radical Mechanisms for Methyl Transfer in Antibiotic Biosynthesis. Poster presented at: Texas Enzyme Mechanisms Conference; 2012 Jan 7; Austin, TX.

Regional

1. **Allen, K.** and Wang, S. Mechanistic Investigation of Radical-Dependent P-methylation. Poster presented at: NIH Biotechnology symposium; 2013 April 19; Pullman, WA.
2. **Allen, K.**, Hu, K., Helms, G., Wang, S. SD1168 from *Shewanella denitrificans* is an Unexpected P-methyltransferase. Poster presented at: Cougs in Biotechnology NIH symposium; 2012 April 25; Pullman, WA.
3. **Allen, K.**, DeLine, M., Wang, S. Fom3 is a Radical SAM Methyltransferase in Fosfomycin Biosynthesis. Poster presented at: WSU CVM Pfizer Student Research Symposium; 2011 Oct 30; Pullman, WA.
4. **Allen, K.**, DeLine, M., Wang, S. Fom3 is a Radical SAM Methyltransferase in Fosfomycin Biosynthesis. Poster presented at: NIH Biotechnology Symposium; 2011 April 24; Pullman, WA.
5. **Allen, K.**, DeLine, M., Wang, S. Radical Mechanisms for Methyl Transfer in Antibiotic Biosynthesis. Poster presented at: Washington State University Showcase; 2011 Mar 25; Pullman, WA.

OTHER PROFESSIONAL DEVELOPMENT

Fall 2016, National Science Foundation grants conference in Pittsburgh, PA

2016, Gonzaga Advising Academy

Summer-Fall 2016, CTA Course Design Institute

Spring 2016, CTA teaching workshops

TEACHING EXPERIENCE

Gonzaga University

General Chemistry (CHEM 101), General Chemistry Laboratory (CHEM 101L), Bioanalytical Chemistry (CHEM 240), Bioanalytical Chemistry Laboratory (CHEM 240L), Biochemistry (CHEM 440)

Virginia Tech
Biochemistry Lab (BCHM 4124)

Washington State University
Graduate Teaching Assistant: General Biology Lab (Biol 107), Microbiology Lab (MBios 306)
Microbiology (MBios 305, guest lecturer)

Eastern Washington University
Undergraduate Teaching Assistant, Medical Bacteriology Lab (Biol 335)

THESIS STUDENTS MENTORED

Kevin Brandecker (class of 2017), Sarah Byquist (class of 2017)

OTHER RESEARCH STUDENTS MENTORED

Lisa DePledge (3 semesters, class of 2018), Megan Zimbleman (1 semester, class of 2018), Alexandra Neitz (1 semester, Class of 2018), Jack Wilcox (1 semester, Class of 2018), Miles Baltagi (1 semester, Class of 2018)

ACADEMIC CITIZENSHIP AND SERVICE AT GONAGA

2016-current, Engineering Senior Project liaison, provide assistance and support to four engineering students for their bioreactor design project

2015-current, Health Sciences Committee member

2015-current, Chemistry and Biochemistry department budget committee member

Spring 2015, Boy Scouts, chemistry merit badge tour

EXTERNAL ACADEMIC CITIZENSHIP AND SERVICE WHILE AT GONZAGA

National Science Foundation, BIO directorate, Ad-hoc grant proposal reviewer for CAREER

Journal of Bacteriology, invited reviewer

PREVIOUS SERVICE

2013-2015, Undergraduate and graduate student mentor in graduate/undergraduate mentoring program at Virginia Tech

2012-2013, NIH Protein Biotechnology Forum President

2011-2012, NIH Protein Biotechnology Forum Vice-president

2010-2011, Molecular Biosciences Graduate Student Association Secretary

2009-2013, NIH Protein Biotechnology Program Member

2009-2013, “Science Saturdays: Microbes and biocatalysts”- hands-on workshops at local science center for children K-5, Pullman, WA

PROFESSIONAL MEMBERSHIPS

2015- American Society for Microbiology

2008- American Chemical Society

2008- American Association for the Advancement of Science