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Areas of Expertise: Chemical biology; Activity-based protein profiling; Mechanistic characterization of photoautotrophs, cellulolytic microbes, microbial communities, and human cells and tissues; Proteomics, imaging, and flow cytometry.

Employment

Oct 2008 -
Present

Pacific Northwest National Laboratory (PNNL), Richland, WA
Senior Scientist, Level IV (of V)
Biological Sciences Division, Earth & Biological Sciences Directorate

Aug 2014 -
Present

Washington State University, Pullman, WA
Joint Appointee, Research Professor
Department of Chemical Engineering and Bioengineering

Aug 2012 -
Present

Washington State University, Pullman, WA
Adjunct Professor, Graduate Faculty
School of Molecular Biosciences & College of the Environment

Scientific Preparation / Education

Jul 2006 -
Sept 2008

The Scripps Research Institute, La Jolla, CA
Postdoctoral Fellow of the California Breast Cancer Research Program
Activity-Based Protein Profiling of the Cytochrome P450 Enzyme Family
Advisor: Professor Benjamin F. Cravatt

Aug 2001 -
Apr 2006

The University of Texas, Austin, TX
Ph.D. in Organic Chemistry, Graduate Fellow of the Banks Foundation
Molecular Recognition of Bioanalytes Using Synthetic Selective and Differential Receptors
Advisor: Professor Eric V. Anslyn

May 2000 -
Sept. 2000

The University of Washington, Seattle, WA
National Science Foundation–Research Experience for Undergraduates Fellow
Fluorinated Warfarin Derivatives to Probe the Active Site of P450 2C9
Advisor: Professor William F. Trager

Aug. 1997 -
May 2001

George Fox University, Newberg, OR
B.S. in Chemistry – Departmental Highest Honors and cum Laude
Synthesis of Cholesteric Liquid-Crystal Displays for Barbiturate Recognition
Advisor: Professor R. Carlisle Chambers

University Teaching Experience

Spring 2016

CHEM 490; Department of Chemistry, Washington State University, Richland, WA
I developed the curriculum and each spring semester I teach a three-credit upper division course, "*Chemical Biology: Emergent Chemistry Technologies for Biological Research.*" This course focuses on recent chemical biology approaches for much

improved characterization of biological pathways, functions, interactions, etc. These approaches include non-natural amino acids, chemical probing, chemical genetics, chemical ecology, chemical physiology, synthetic biology, etc. The course will rely on the current literature, and will feature discussions on the pioneers and emerging scientific leaders in chemical biology.

Fall 2015/16 **MBIOS 413/513; Department of Molecular Biosciences, Washington State University, Richland, WA**

I developed the curriculum and each fall semester I teach a three-credit upper division and graduate course, "*Advanced Biochemistry*." The aim of the course is to have students dig deeply into foundational biochemistry topics, technology, and scientific literature. Specifically, we studied the structure and function of proteins, nucleic acids and biological membranes, principles of enzymology, and omics & biochemistry technologies. The course has a strong focus on current literature and modern technologies for biochemistry.

Fall 2012 **CHEM 410/510; Department of Chemistry, Washington State University, Richland, WA**

I developed the curriculum and taught a one semester, three credit, upper division and graduate course, "*Introduction to Proteomics*." This course focused on the analytical, biochemical, and chemical facets of the field of proteomics, with direct correlations to human health, the environment, and bioenergy. I lectured, recruited guest speakers, advised students, wrote and graded homework and exams, and oversaw group projects.

Spring 2005 **Department of Chemistry, University of Texas, Austin, TX**

Teaching Assistant for the upper division and graduate course, "*Advanced Physical Organic Chemistry*." I led recitation and review sessions, held office hours, and assisted in writing and grading exams. While a TA for this course I worked with Prof. Eric Anslyn to refine the content for his textbook, "*Modern Physical Organic Chemistry*," prior to its publication in 2006.

Spring 2003 **Department of Biological Sciences, University of Texas, Austin, TX**

Teaching Assistant for a course for non-majors, "*Introduction to Life Sciences*." I led recitation and review sessions, held office hours, and graded exams.

Fall 2002 **Department of Chemistry, University of Texas, Austin, TX**

Teaching Assistant for, "*Organic Chemistry II*." I led recitation and review sessions, held office hours, and assisted in writing and grading exams. I developed "Arrow Pushing" review sessions to help students understand difficult mechanistic concepts presented in this course.

Fall 2001 - **Department of Chemistry, University of Texas, Austin, TX**

Spring 2002 Laboratory Instructor for, "*Chemistry for Nurses*." I led a one-hour review session and two-hour laboratory course per week, held office hours, and wrote and graded laboratory exams. In this course I sought to correlate key chemistry concepts to real-world health applications relevant to a clinical nurse.

Research Mentoring & Advising Experience

Spring 2012 - **Graduate Advisor, Washington State University, Richland, WA**

Present Mentor, advise, and formulate chemical biology projects for five students pursuing master's degrees, and two PhD students.

Spring 2009 - **Advisor for Postdoctoral Research Fellows, PNNL, Richland, WA**

Present Mentor and facilitate the design of research projects with postdoctoral fellows with the goal of inspiring high levels of independent thought and creativity. I have mentored eight fellows and I am presently mentoring four fellows.

- Spring 2009 - Present
Advisor for Long-Term Undergraduate Interns, PNNL, Richland, WA
Mentor undergraduates in individual chemical biology research projects, promote advanced project management by the students, and teach writing and presentation skills. I have mentored 10 undergraduate students who have spent >6 months in my research group. These students lead research efforts in my group, present their research at national conferences, and have published in primary roles on peer-reviewed journal articles.
- Summer '09 - Present
Advisor for the Summer Undergraduate Laboratory Intern Program, PNNL, Richland, WA
Create individual chemical biology research projects and mentor undergraduate students in this competitive internship program that provides opportunities for laboratory research in the STEM fields in my research group. I have mentored 20 students, several who have participated as authors on peer-reviewed journal articles. These students have gone on to careers and advanced studies in science, medicine, and pharmacology.
- Fall 2013 - Fall 2014
Advisor for the University of Oregon Master's in Chemistry Program, PNNL, Richland, WA
Mentored, advised, and designed a nine-month research project for a UO student pursuing her master's degree, for which the internship is a program requisite.
- Fall 2013 - Fall 2014
Alternate Sponsored Fellow Program for Visiting Faculty, PNNL, Richland, WA
Advised and designed research projects with a visiting faculty member from China who wanted to learn particular elements of the lignocellulose degradation research ongoing in my group.
- Fall 2006 - Fall 2008
High School Laboratory Internships, The Scripps Research Inst., La Jolla, CA
This program provides laboratory research experiences to local high school students. I designed short- and long-term projects consistent with the skill levels and interests of the participating students. One student, Daniel Song, was a second author on a journal article describing our work in the *J. Am. Chem. Soc.*
- Spring 2004 - Spring 2006
Honors Program, University of Texas, Austin, TX
Mentored an undergraduate student in his required research project. In conjunction with my research advisor we designed an undergraduate laboratory lesson plan that translated elements of my graduate research into the undergraduate classroom. This curriculum was published in the *Journal of Chemical Education*.

Research Project Management & Experience

- Jan 2017
Gordon and Betty Moore Foundation (funded through WSU, not PNNL)
Lead, Chemical Biology; \$56K/year. In collaboration with the University of Georgia, my group is developing new chemical probes to explore nutrient drivers of microbial spatial and functional interactions occurring in ocean microbiomes.
- Oct 2016
Acerta Pharma (an affiliate of AstraZeneca)
Principal Investigator. The details of the research to be performed and the funding details are protected under a non-disclosure agreement and can not be publically disclosed.
- May 2016 - Present
PNNL Microbiomes in Transition Initiative, Soil Microbiome
Co-Principal Investigator; \$150K/year. My group is working closely with soil and modeling experts to define spatial-function relationships in soil microbiomes related to cellulose and protein degradation.
- May 2015 - Present
PNNL Microbiomes in Transition Initiative, Gut Microbiome
Principal Investigator; \$280K/year. My group is using activity-based protein profiling to (*i*) evaluate the hypothesis that perturbations in the composition of the gut

microbiome influence susceptibility by altering host metabolic capacity toward xenobiotics, and (ii) we are creating novel flow cytometry, imaging, and chemoproteomic analytics to profile the metabolically active subset of microbes and proteins within the gut microbiome.

Oct 2014 -
Present

PNNL Laboratory Directed Research & Development

Principal Investigator; \$200K/year. My group is developing 'Chromatin Activity Probing (ChAP)' in which chemical probe mimics of nutrients bind DNA regulators and RNA-based riboswitches and permit the simultaneous determination of novel DNA/RNA regulators and the DNA they regulate.

Jun 2014 -
Present

US Department of Energy Biological and Environmental Research (DOE-BER) Mesoscale Imaging Project

Co-Investigator; \$165K/year. My group is using synthetic organic chemistry to develop chemical tools to characterize nutrient transport and intracellular fate in various microbes using super resolution fluorescence microscopy, electron microscopy, and other imaging techniques.

April 2014-
Present

US National Institutes of Health (NIH), NHLBI, U01 HL122703

Team Lead, Activity-Based Protein Profiling; \$100K/year. My group is developing new chemical probes for subcellular imaging of phase I and II metabolism in mammalian lungs.

June 2013-
Present

US NIH, NIGMS, P41 GM103493, Proteomics Research Ctr for Integrative Biol.

Co-Principal Investigator; \$2.34M/year. In conjunction with the proteomic and informatics developments and the collaborative projects within the Center, my chemical biology group is developing novel chemical probes and chemoproteomic capabilities to advance state-of-the-art proteomics measurements to impact biological research, primarily in the area of drug resistant *Mycobacterium tuberculosis* and the human gut microbiome.

April 2013 -
Present

US NIH, NIEHS, P42 ES016465

Team Lead, Activity-Based Protein Profiling; \$150K/year. My group is synthesizing chemical probes to investigate phase I and II metabolism in the livers of embryonic, juvenile, and adult mice exposed to polyaromatic hydrocarbons, which are primary constituents of environmental toxins and cigarette smoke.

Feb 2013 -
Present

US NIH, NIAID, R01 AI104589

Principal Investigator at PNNL; \$180K/year. Our research team is employing proteomics to identify biomarkers of drug response in plasma from patients infected with *Mycobacterium tuberculosis* from Uganda, Vietnam, and the US. We are working in close collaboration with researchers at UCSF.

Oct 2013 -
Present

US DOE-BER Pan-Omics Research Program

Team Lead, Chemoproteomics & Activity-Based Protein Profiling; \$75K/year. My group is developing novel chemical probes, intact chemoproteomic methods, and chemoproteomic quantification tools. Our biology foci has been on lignocellulose degrading microbes and microbial communities, and hydrogen producing cyanobacteria.

Oct 2012 -
Present

US DOE-BER Foundational Scientific Focus Area

Project Manager and Chemical Biology Lead; \$5.75M/year. My group is synthesizing novel chemical probes that mimic vitamins, metabolites, and osmolytes that are critical to microbial survival and signaling. The chemical tools are being used directly in complex microbial communities to characterize the drivers of microbial functional and spatial interactions.

Oct 2010 -
Present

US DOE-Environmental & Molecular Sciences Laboratory Science Theme

EMSL Project Lead; ~\$100K/year. My group develops activity-based probes and coordinates biological studies associated with collaborative EMSL User projects.

Our projects are associated with redox in cyanobacteria, protein and lignocellulose degradation in soil microbiomes, and bioremediation of polyaromatic hydrocarbons.

Oct 2010 -
Sept 2015

**US Department of Energy Biological and Environmental Research (DOE-BER)
Biofuels Scientific Focus Area**

Co-Principal Investigator; \$150K/year. My research group developed and deployed probes to characterize Cysteine thiol oxidation and redox cycling directly in living cyanobacteria. These cyanobacteria are capable of photosynthetic biofuel production, e.g., hydrogen.

Oct 2010 -
Feb 2013

PNNL Microbial Communities Initiative

Co-Principal Investigator; \$330K/year. My research team synthesized chemical tools to profile active enzymes participating in lignocellulose degradation in complex anaerobic microbial communities. Worked collaboratively with members of the initiative at PNNL and Washington State University to enhance proteomic technologies for better measurements and created novel software for improved data analysis.

Oct 2009 -
Sept 2012

PNNL Laboratory Directed Research & Development Award

Principal Investigator; \$250K/year. My research team developed novel chemical tools and proteomic profiling platforms to facilitate research in human health and bioenergy. Specifically, we developed chemical probes to annotate pathogenic mechanisms microbial lung pathogens use to infect their host, and we developed a large suite of probes to characterize hydrolytic enzymes involved in lignocellulose degradation in aerobic and anaerobic prokaryotic and eukaryotic microbes.

Jun 2006 -
Sept 2008

Chemical Biology, The Scripps Research Institute, La Jolla, CA

Postdoctoral Research Fellow of the California Breast Cancer Research Program in Prof. Benjamin Cravatt's research group. I synthesized novel chemical tools to profile the functional activity of the cytochrome P450 enzyme family in living mice and human hepatocytes.

Aug 2001 -
May 2006

Organic Chemistry, University of Texas, Austin, TX

Graduate Research Assistant and Fellow of the Dorothy Banks Foundation in Prof. Eric Anslyn's research group. I created synthetic arrays of chemical receptors that were used to mimic the human tongue by creating differential signatures of target ligands.

May 2000 -
Aug 2000

Organic Chemistry, University of Washington, Seattle, WA

Undergraduate Intern in the NSF-Research Experience for Undergraduates program in Prof. Bill Trager's research group. I synthesized a fluorinated warfarin derivative for structure-based NMR measurements.

Awards & Honors

2016	PNNL Outstanding Performance Award
2015	PNNL Pathway to Excellence Award
2014	PNNL Fitzner-Eberhardt Award Nominee for Outstanding Contributions to Science Education
2014	PNNL Exceptional Contribution Award
2013	PNNL Outstanding Performance Award
2009 – 2012	PNNL Laboratory Directed Research & Development Award
2011	Young Innovator Award, American Chemical Society; Invited Speaker in the Young Innovator Symposium
2010	American Chemical Society Division of Analytical Chemistry: New Investigators in Analytical Chemistry, Pittcon Conference; Invited Speaker
2006 - 2008	Postdoctoral Research Fellow, California Breast Cancer Research Program

2005 - 2006	Dorothy Banks Graduate Research Fellow, Banks Foundation
2005 - 2006	Career Development Grant, University of Texas
2001 - 2002	Dean's Entrance Award, University of Texas
2001	Top Graduating Chemistry Major, George Fox University
2001	Graduated with Honors, <i>Cum laude</i> , George Fox University
2000 - 2001	Dick van Santen Award, American Chemical Society
2000	National Science Foundation - Research Experience for Undergraduates, University Washington Department of Medicinal Chemistry
2000 - 2001	Edwards-Holman Science Scholarship, Edwards-Holman Foundation
1997 - 2001	Dean's Scholar, George Fox University
1997 - 2001	Duke Academic Scholarship, George Fox University

Technical Contributions, Media Coverage, & Affiliations

Publications

*Corresponding Author, †Mentored Student/Postdoc

- [1] Ortega C, Frando A, Webb-Robertson B-J, Anderson LN[†], Flannery EL, Fishbaugher M, Purvine SO, Smith RD, Kappe SHI, **Wright AT***, Grundner C*. ATPase activity in *Plasmodium falciparum* asexual blood stages and gametocytes. *Nature Chem Biol* **2016**, In Review. *Co-corresponding authors.
- [2] Nair RN[†], Rosnow JJ, Murphree TA, Bowden ME, Lindemann SR, **Wright AT***. Unexpected high yielding synthesis of an excellent Michael acceptor: synthesis of alkyne substituted tryptophans for protein incorporation as chemical probes. *Chem Commun.* **2016**, In Review.
- [3] Haitjema CH, Gilmore SP, Henske JK, Solomon KV, de Groot R, Kuo A, Mondo S, Salamov AA, LaButti K, Zhao Z, Chiniquy J, Barry K, Brewer HM, Purvine SO, **Wright AT**, Boxma B, van Alen T, Hackstein JHP, Baker SE, Grigoriev IV, O'Malley MA. Genomes of anaerobic fungi encode conserved fungal cellulosomes for biomass hydrolysis. *Nature Microbiology* **2016**, In Review.
- [4] Koech PK, Wiedner SD[†], Lewis MP[†], Ortega C, Payne SH, Zink EM, Grundner C, Smith RD and **Wright AT***. New azole drug targets and potential routes of resistance in lung pathogens discovered by chemoproteomics. *J. Am. Chem. Soc.* **2016**, In Revision.
- [5] Romine MF, Rodionov DA, Nandhikonda P[†], Maezato Y[†], Rodionova I, Carre A, Anderson LN[†], Xu C, Kim Y-M, Metz TO, **Wright AT***. Elucidation of new roles for vitamin B₁₂ in regulation of folate, ubiquinone, and methionine metabolism. *Proc Natl Acad Sci USA.* **2016**, In Press.
- [6] Sadler NC[†], Bernstein HC, Melnicki MR[†], Charania MA, Hill EA, Anderson LN[†], Monroe ME, Smith RD, Beliaev AS and **Wright AT***. Dinitrogenase driven photobiological hydrogen production alleviates oxidative stress. *Appl Environ Microbiol.* **2016**, In Press. PMID:27742679.
- [7] Rosnow JR[†], Nair R[†], Anderson LN[†], Baker ES and **Wright AT***. Profiling microbial lignocellulose degradation and utilization by emergent omics technologies. *Crit. Rev. Biotechnol.* **2016**, In Press. PMID: 27439855.
- [8] Sadler NC[†], Nandhikonda P[†], Webb-Robertson BJ, Ansong C, Anderson LN[†], Smith JN, Corley RA and **Wright AT***. Hepatic cytochrome P450 activity, abundance, and expression throughout human development. *Drug Metabol. Dispos.* **2016**, *44*, 984-991. PMID: 27084891.
- [9] **Wright, AT**. News & Views: Host-pathogen interactions. *Nature Chem. Biol.* **2016**, *12*, 203-204. PMID: 26900864.
- [10] Solomon KV, Haitjema CH, Henske JK, Gilmore SP, Borges-Rivera D, Lipzen A, Brewer HM, Purvine SO, **Wright AT**, Theodorou MK, Grigoriev I, Regev A, Thompson DA, O'Malley MA.

Early-branching gut fungi possess a large, comprehensive array of biomass degrading enzymes. *Science* **2016**, *351*, 92-95. PMID: 26912365.

- [11] Bennett K, Sadler NC[‡], **Wright AT**, Yeager C and Hyman MR. Activity-based protein profiling of ammonia monooxygenase in *Nitrosomonas europaea*. *Appl. Environ. Microbiol.* **2016**, *82*, 2270-2279. PMID: 26826234.
- [12] Ortega C, Anderson LN[‡], Frando A, Sadler NC[‡], Brown RW, Smith RD, **Wright AT*** and Grundner C*. Systematic survey of serine hydrolase activity in *Mycobacterium tuberculosis* defines changes associated with persistence. *Cell Chem. Biol.* **2016**, *23*, 290-298. PMID: 26853625. *Co-corresponding authors. This work was profiled in the following summary article: Boshoff, HI. *Cell Chem. Biol.* **2016**, *23*, 209-211 (PMID: 26971871).
- [13] Anderson LN[‡], Koech PK, Plymale AE, Landorf EV, Konopka A, Collart FR, Lipton MS, Romine MF and **Wright AT***. Live cell discovery of microbial vitamin transport and enzyme-cofactor interactions. *ACS Chem. Biol.* **2016**, *11*, 345-354. PMID: 26669591. **Front Cover. Featured Article. Ms. Anderson was profiled as a featured student author by the journal (pg 291 of the same issue). Press release: <http://www.pnnl.gov/news/release.aspx?id=4253>. Reported at numerous media outlets including the American Chemical Society, *Science Daily*, and *BioTechniques*. Podcast: <http://pubs.acs.org/page/acbcct/audio/index.html>.**
- [14] Biteen JS, Blainey PC, Cardon ZG, Chun M, Church G, Dorrestein PC, Fraser SE, Gilbert J, Jansson JK, Knight R, Miller JF, Ocan A, Prather KA, Taha S, van den Engh G, Quake S, Ruby EG, Silver P, Weiss PS, Wong GCL, **Wright AT**, Xie XS, Young TD. Tools for the microbiome: nano and beyond. *ACS Nano.* **2016**, *10*, 6-37. PMID: 26695070. Invited Review. **Front Cover.**
- [15] Perez DM, Parker RS, Berres ME, **Wright AT**, Sadler NC[‡], Sifri M and Richards MP. Role of cytochrome P450 hydroxylases in the decreased accumulation of vitamin E in muscle from turkeys compared to chickens. *J. Ag. Food Chem.* **2016**, *64*, 671-80. PMID:26653675.
- [16] Bernstein HC, Charania MA, McClure RS, Sadler NC[‡], Melnicki MR[‡], Hill EA, Markillie LM, Nicora CD, **Wright AT**, Romine MF and Beliaev AS. Multi-omic dynamics associate oxygenic photosynthesis with nitrogenase-mediated H₂ production in *Cyanothece* sp. ATCC 51142. *Science Reports* **2015**, *5*, 16004. PMID: 26525576.
- [17] Liu Y, Fredrickson JK, Sadler NC[‡], Nandhikonda P[‡], Smith RD and **Wright AT***. Advancing understanding of microbial bioenergy conversion processes by activity-based protein profiling. *Biotechnol. Biofuels* **2015**, *8*, 156. PMID: 26413155.
- [18] **Wright AT**, Magnaldo T, Sontag RL, Anderson LN[‡], Sadler NC[‡], Piehowski PD, Gache Y and Weber TJ. Deficient expression of aldehyde dehydrogenase 1A1 is consistent with increased sensitivity of Gorlin syndrome patients to radiation carcinogenesis. *Mol. Carcinogenesis* **2015**, *54*, 473-484. PMID: 24285572.
- [19] Sadler NC[‡] and **Wright AT***. Activity-based protein profiling of microbes. *Curr. Opin. Chem. Biol.* **2015**, *24*, 139-144. PMID: 25531039.
- [20] Pena-Castillo L, Mercer RG, Gurinovich A, Callister SJ, **Wright AT**, Westbye AB and Lang AS. Gene co-expression network analysis in *Rhodobacter capsulatus* and application to comparative expression analysis of *Rhodobacter sphaeroides*. *BMC Genomics* **2014**, *BMC Genomics* **2014**, *15*, 730. PMID: 25164283.
- [21] Ansong C, Sadler NC[‡], Hill EA, Lewis MP[‡], Zink EM, Smith RD, Beliaev AS, Konopka AE and **Wright AT***. Characterization of protein redox dynamics induced during light-to-dark transitions and nutrient limitation in cyanobacteria. *Frontiers Microbiol.* **2014**, *5*, 325. PMID: 25071738.
- [22] Liu Y, Zhang R, Lian Z, Wang S and **Wright AT**. Yeast cell surface display for lipase whole cell catalysts and its applications. *Journal Mol. Cat. B – Enzymatic* **2014**, *106*, 17-25.
- [23] Wiedner SD[‡], Anderson LN[‡], Sadler NC[‡], Chrisler WB, Kodali VK, Purvine SO, Weitz KK, Smith RD and **Wright AT***. Live cell organelle-specific activity-based protein profiling. *Angew. Chem. Int. Ed.* **2014**, *53*, 2919-2922. PMID: 24505022.

- [24] Ortega C, Liao R, Anderson LN[‡], Rustad T, **Wright AT**, Sherman DR and Grundner C. *Mycobacterium tuberculosis* Ser/Thr protein kinase B mediates an oxygen-dependent replication switch. *PLoS Biology* **2014**, *12*, e1001746. PMID: 24409094.
- [25] Sadler NC[‡], Melnicki MR[‡], Serres MH, Merkley ED[‡], Chrisler WB, Hill EA, Romine MF, Kim S, Zink EM, Datta S[‡], Smith RD, Beliaev AS, Konopka A and **Wright AT***. Live cell chemical profiling of temporal redox dynamics in a photoautotrophic cyanobacterium. *ACS Chemical Biology* **2014**, *9*, 291-300. PMID: 24168666. **Front Cover. Featured Article. Top 10 most read article. Ms. Sadler & Dr. Melnicki were profiled as featured student authors by the journal (pages 3-7 of the same issue). Press release: <http://www.pnnl.gov/news/release.aspx?id=1024>. Reported at numerous media outlets including C&E News, R&D Magazine, Phys.org, and Nanowerk.**
- [26] Ismail HM, O'Neill PM, Hong D, Finn R, Henderson C, **Wright AT**, Cravatt BF, Hemingway J and Paine MJ. Pyrethroid activity-based probes for profiling cytochrome P450 activities associated with insecticide interactions. *Proc. Natl. Acad. Sci. USA* **2013**, *110*, 19766-19771. PMID: 24248381.
- [27] Anderson LN[‡], Culley DE, Hofstad BA, Chauvigne-Hines LM[‡], Zink EM, Purvine SO, Smith RD, Callister SJ, Magnuson JM and **Wright AT***. Activity-based protein profiling of secreted cellulolytic enzyme activity dynamics in *Trichoderma reesei* QM6a, NG14, and RUT-C30. *Mol. BioSystems* **2013**, *9*, 2992-3000. PMID: 24121482. **Front Cover. Featured "HOT" article. Top 10 most accessed article in 2013. Press release: <http://www.pnnl.gov/news/release.aspx?id=1018>. Reported at numerous media outlets including Bloomberg, Greenwire, Science Daily, and Biofuels Journal.**
- [28] Crowell SR, Sharma AK, Amin S, Soelberg JJ, Sadler NC[‡], **Wright AT**, Baird WM, Williams DE and Corley RA. Impact of pregnancy on the pharmacokinetics of dibenzo[def,p]chrysene in mice. *Toxicol Sci.* **2013**, *135*, 48-62. PMID: 23744095. **Awarded as "Best Paper Published in 2013 Demonstrating Application of Risk Assessment" by the Society of Toxicology.**
- [29] Wiedner SD[‡], Ansong C, Webb-Robertson BJ, Pederson LM[‡], Fortuin S[‡], Hofstad BA, Shukla AK, Panisko EA, Smith RD and **Wright AT***. Disparate proteome responses of pathogenic and nonpathogenic aspergilli to human serum measured by activity-based protein profiling (ABPP). *Mol. Cell. Proteomics* **2013**, *12*, 1791-1805. PMID: 23599423.
- [30] Ansong C, Ortega C, Payne SH, Haft DH, Chauvigne-Hines LM[‡], Lewis MP[‡], Ollodart AR, Purvine SO, Shukla AK, Fortuin S[‡], Smith RD, Adkins JN, Grundner C and **Wright AT***. Novel and widespread adenosine nucleotide-binding in *Mycobacterium tuberculosis*. *Chemistry & Biology* **2013**, *20*, 123-133. PMID: 23352146. **Featured Article.**
- [31] Chauvigne-Hines LM[‡], Anderson LN[‡], Weaver HM[‡], Brown JN, Koech PK, Nicora CD, Hofstad BA, Smith RD, Wilkins MJ, Callister SJ and **Wright AT***. A suite of activity-based probes for cellulose degrading enzymes. *J. Am. Chem. Soc.* **2012**, *134*, 20521-20532. PMID: 23176123.
- [32] Sadler NC[‡], Angel TE[‡], Lewis MP[‡], Pederson LM[‡], Chauvigne-Hines LM[‡], Wiedner SD[‡], Zink EM, Smith RD and **Wright AT***. Activity-based protein profiling reveals mitochondrial oxidative enzyme impairment and restoration in diet-induced obese mice. *PLoS One* **2012**, *7*, e47996. PMID: 23110155.
- [33] Wiedner SD[‡], Burnum KB, Pederson LM[‡], Anderson LN[‡], Fortuin S[‡], Chauvigne-Hines LM[‡], Shukla AK, Ansong C, Panisko EA, Smith RD and **Wright AT***. Multiplexed activity-based protein profiling of the human pathogen *Aspergillus fumigatus* reveals large functional changes upon exposure to human serum. *J. Biol. Chem.* **2012**, *287*, 33447-33459. PMID: 22865858.
- [34] Umali A, Anslyn EV, **Wright AT**, Blieden CR[‡], Smith CK, Tian T, Truong JA, Crumm CE, Garcia JE, Lee S, Mosier M and Nguyen CP. Analysis of citric acid in beverages: use of an indicator displacement assay. *J. Chem. Education* **2010**, *87*, 832-835. DOI:10.1021/ed900059n.
- [35] **Wright AT**, Song JD[‡] and Cravatt BF. A suite of activity-based probes for human cytochrome P450 enzymes. *J. Am. Chem. Soc.* **2009**, *131*, 10692-10700. PMID: 19583257.

- [36] Cravatt BF, **Wright AT** and Kozarich JW. Activity-based protein profiling: from enzyme chemistry to proteomic chemistry. *Annu. Rev. Biochem.* **2008**, *77*, 383-414. PMID: 18366325.
- [37] **Wright AT** and Cravatt BF. Chemical proteomic probes for monitoring cytochrome P450 activities and drug interactions in vivo. *Chem. Biol.* **2007**, *14*, 1043-1051. PMID: 17884636.
- [38] **Wright AT**, Edwards N, Anslyn EV and McDevitt JT. The discriminatory power of differential receptor arrays is improved by prescreening – a demonstration in the analysis of tachykinins and similar peptides. *Angew. Chem. Int. Ed.* **2007**, *46*, 8212-8215. PMID: 17899565.
- [39] Collins BE, **Wright AT** and Anslyn EV. Combining molecular recognition, optical detection, and chemometric analysis. *Top. Curr. Chem.* **2007**, *277*, 181-218. DOI:10.1007/128_2007_114.
- [40] **Wright AT** and Anslyn EV. Differential arrays for the pattern recognition of analytes. *Chem. Soc. Rev.* **2006**, *35*, 14-28. PMID: 16365639. **Front Cover.**
- [41] **Wright AT**, Anslyn EV and McDevitt JT. A differential array of metalated synthetic receptors for the analysis of tripeptide mixtures. *J. Am. Chem. Soc.* **2005**, *127*, 17405-17411. PMID: 16332090.
- [42] **Wright AT**, Zhong Z and Anslyn EV. A functional assay for heparin in serum using a designed synthetic receptor. *Angew. Chem. Int. Ed.* **2005**, *44*, 5679-5682. PMID: 16086350.
- [43] **Wright AT**, Griffin MJ, Zhong Z, McCleskey SC, Anslyn EV and McDevitt JT. Differential receptors create patterns that distinguish various proteins. *Angew. Chem. Int. Ed.* **2005**, *44*, 6375-6379. PMID: 16155962.
- [44] **Wright AT** and Anslyn EV. Cooperative metal-coordination and ion-pairing in tripeptide recognition. *Org. Lett.* **2004**, *6*, 1341-1344. PMID: 15101737.

Patents

- [1] Lindemann SR and **Wright AT**. Chromatin activity precipitation method and system. (2015). Patent application submitted.
- [2] Anslyn EV, McDevitt JT, Shear JB, Neikirk DP, **Wright AT**, Zhong Z. System and method of analyte detection using differential receptors. U.S. Patent No. 2,009,215,646 (2009). Licensed by LabNow.
- [3] Anslyn EV, McDevitt JT, Shear JB, Neikirk DP, **Wright AT**, Zhong Z. System and method of analyte detection using differential receptors, WO2,007,005,666 (2007). Licensed by LabNow.
- [4] Anslyn EV, **Wright AT**, Zhong Z. Synthetic receptors for the detection of analytes. U.S. Patent No. 7,514,266 (2006). Licensed by Beacon Sciences.

Invited Presentations

- [1] Pending: University of Washington, Department of Medicinal Chemistry, Seattle, WA, November 2016, "Activity-based profiling of drug metabolism in the gut microbiome and the host liver."
- [2] Pending: Protein Function Discovery Workshop, Argonne National Laboratory, Chicago, IL, November 2016. Invited panelist.
- [3] UC Santa Cruz, Department of Microbiology and Environmental Toxicology, Santa Cruz, CA, October 2016, "Microbial vitamin transport and drug metabolism revealed by activity-based protein profiling."
- [4] Baylor College of Medicine, Department of Pharmacology, Houston, TX, October 2016, "Drug metabolism in the gut microbiome; chemical probing for protein function."
- [5] International Society for Microbial Ecology, session convener and invited speaker, Montreal, Quebec, Canada, August 2016, "Activity-based probing reveals new contributions for vitamin B12 in modulation of microbial protein activity and gene regulation."

- [6] International Society for Microbial Ecology, roundtable speaker, Montreal, Quebec, Canada, August 2016, "The rapidly changing technology landscape of microbial systems research."
- [7] Washington State University, School of Molecular Biosciences, Pullman, WA, April 2016, "Live cell microbial protein profiling of B vitamin acquisition and disposition by chemical probing."
- [8] DOE Genomic Sciences Program Annual Meeting, Washington, DC, March 2016, "New chemical probes for microbial protein profiling reveal a role for vitamin B₁₂ in controlling folate and methionine metabolism."
- [9] Human Microbiome Congress, San Diego, CA, February 2016, "Activity-based protein profiling of drug metabolism in the gut microbiome."
- [10] Washington State University, Pullman, WA, August 2015, "Advancing our understanding of microbial regulatory processes and community associations by activity-based protein profiling."
- [11] North Carolina State University, Raleigh, NC, April 2015, "Characterization of *in situ* microbial metabolism, redox regulatory dynamics, and nutrient acquisition and disposition by chemical probing."
- [12] University of North Carolina, Greensboro, NC, April 2015, "Chemical probing to investigate human phase I metabolism and microbial protein functions and regulation."
- [13] Michigan State University, Lansing, MI, January 2015, "Characterization of *in situ* microbial metabolism, redox regulatory dynamics, and nutrient acquisition and disposition by chemical probing."
- [14] Peking University, Beijing, China, November 2014, "Characterization of cellular functions and regulation by chemical probing."
- [15] Beijing University of Chemical Technology, Beijing, China, November 2014, "Characterization of cellular functions and regulation by chemical probing."
- [16] American Chemical Society National Meeting, San Francisco, CA, August 2014, "Activity-based protein profiling of cytochrome P450 enzyme ontogeny in the developing human fetus."
- [17] Society for Industrial Microbiology & Biotechnology Annual Meeting, St. Louis, MO, July 2014, "Probe-based functional profiling of lignocellulose degrading microbes."
- [18] American Society of Microbiology National Meeting, Boston, MA, May 2014, "Activity-based functional proteomics of fungi."
- [19] Joint Genome Institute, Walnut Creek, CA, April 2014, "Characterization of microbial cell and community function, interactions, and regulation by chemical probing."
- [20] US HUPO National Meeting, Seattle, WA, April 2014, "Live cell organelle-specific characterization of cathepsins by activity-based protein profiling."
- [21] Washington State University, Professional Networking Day, Richland, WA, March 2014. Presented on career options in science, and on scientific writing.
- [22] University of Washington, Department of Global Health, Seattle, WA, January 2014, "Redox & oxidative chemoproteomics to investigate human health and bioenergy."
- [23] American Chemical Society National Meeting, Indianapolis, IN, Sept 2013, "Activity-based protein profiling reveals systemic effects of smoking and obesity on cytochrome P450 function."
Press conference: <http://www.ustream.tv/recorded/38594429>. Has been published at more than 20 media outlets including the Huffington Post, Science Daily, and Everyday Health.
- [24] American Chemical Society, National Meeting, Young Innovator's Symposium, Denver, CO, August 2011, "Identification of proteins relevant to bioenergy and disease pathology by chemical proteome profiling."
- [25] Society for Industrial Microbiology, National Meeting, New Orleans, LA, July 2011, "Identification of proteins relevant to bioenergy and fungal disease pathology by chemical proteome profiling."
- [26] Global Infectious Disease Seminar Series, Seattle Biomedical Research Symposium, Seattle, WA, December 2010, "Chemical profiling of protein functions and interactions."

- [27] Washington State University, Pullman, WA, September 2010, "Chemical protein profiling."
- [28] University of Washington, Department of Microbiology, Seattle, WA, July 2010, "Chemical activity-based protein profiling."
- [29] Infectious Diseases Research Institute, Seattle, WA, July 2010, "Chemical activity-based protein profiling."
- [30] George Fox University, Newberg, OR, October 2005, "Electronic tongues, blood thinners, and hormones."
- [31] Linfield University, McMinnville, OR, October 2005, "Electronic tongues and blood thinners."
- [32] SPRING Nanotechnology Conference, Austin, TX, July 2003, "Molecular recognition of tripeptides with a designed receptor."

Presentations

- [1] European Science Foundation, Thiol-Based Redox Switches in Life Science Conference, San Feliu de Guixols, Spain, Sept 2015, "Characterization of live cell protein thiol redox dynamics associated with hydrogen production in *Cyanothece* sp. ATCC 51142 by chemical probing."
- [2] Keystone Symposium, Vancouver, BC, Canada, Jan 2014, "Obese cigarette smokers have altered phase I metabolism in the liver and lung."
- [3] American Chemical Society National Meeting, Indianapolis, IN, Sept 2013, "Chemical profiling of B vitamin transport *in vivo* in *Streptococcus pyogenes* and *Chloroflexus aurantiacus* J-10-fl."
- [4] 11th Workshop on Cyanobacteria, St. Louis, MO, August 2012, "Live cell characterization of temporal redox dynamics by chemical profiling in the photoautotroph *Synechococcus* sp. PCC 7002." **Awarded - Best Presentation.**
- [5] HUPO World Congress, Boston, MA, Sept. 2012, "Activity-based protein profiling reveals systemic and acute effects of smoking on cytochrome P450 function in lean and obese individuals."
- [6] Institute for Systems Biology Symposium, Seattle, WA, April 2012, "Characterization of redox regulation of electron flux and carbon partitioning in live cyanobacteria by chemical probes."
- [7] DOE Genomic Sciences Meeting, Washington, D.C., March 2012, "Live cell identification of redox regulated dithiol sensors by chemical probes."
- [8] DOE Genomic Sciences Meeting, Washington, D.C., March 2012, "Chemical profiling of group B vitamin transport and protein interactions in microbes and microbial communities."
- [9] American Chemical Society, National Meeting, Denver, CO, August 2011, "Chemical proteome profiling of redox active proteins in cyanobacteria."
- [10] American Chemical Society, National Meeting, Denver, CO, August 2011, "Characterization of functionally active cellulose degrading enzymes in anaerobic organisms and complex microbial communities using chemical proteome profiling."
- [11] DOE Genomic Sciences Meeting, Washington, D.C., April 2011, "Proteomic measurements of redox sensing post-translational modifications in cyanobacteria."
- [12] Cytochrome P450 Biodiversity and Biotechnology Symposium, Woods Hole, MA, October 2010, "Chemical proteomic profiling of cytochrome P450 enzymes."
- [13] American Chemical Society, Western Regional Meeting, San Diego, CA, October 2007, "Chemical proteomic probes for profiling cytochrome P450 induction and drug interactions."
- [14] Society of Fellows Research Symposium, The Scripps Research Institute, La Jolla, CA, October 2007, "Chemical proteomic probes for evaluating cytochrome P450 activities and drug interactions *in vivo*."
- [15] California Breast Cancer Research Symposium, Los Angeles, CA, September 2007, "Activity probes for monitoring cytochrome P450 induction and drug interactions *in vivo*."

- [16] American Chemical Society, National Meeting, Boston, MA, August 2007, "Activity probes for profiling cytochrome P450 induction and drug interactions."
- [17] Gordon Research Conference, Organic Structures and Properties, Buellton, CA, January 2006, "Differential receptors for pattern recognition of bioanalytes."
- [18] American Chemical Society, National Meeting, San Diego, CA, March 2005, "Differential receptors create patterns that distinguish various proteins."
- [19] American Chemical Society, National Meeting, San Diego, CA, March 2001, "Synthesis of warfarin analogs to probe the active site of Cytochrome P450-2C9."
- [20] Murdock Research Conference, Tacoma, WA, October 2000, "Synthesis of warfarin analogs to probe the active site of Cytochrome P450-2C9."
- [21] NSF Symposium, Seattle, WA, August 2000, "Synthesis of warfarin analogs to probe the active site of Cytochrome P450-2C9."

Media Coverage of Research

- [1] Podcast interview on B vitamin transport and intracellular disposition will be available at: <http://pubs.acs.org/page/acbcct/audio/index.html>.
- [2] Press release on B vitamin transport and intracellular disposition profiled by chemical probes: <http://www.pnnl.gov/news/release.aspx?id=4253>. Reported at >20 media outlets including the American Chemical Society, *Science Daily*, and *BioTechniques*.
- [2] Press release on a systems biology approach to characterize cyanobacteria hydrogen production: <http://www.pnnl.gov/news/release.aspx?id=4234>. Reported at >20 media outlets.
- [3] "Protein Profiling Plumbs Hidden Depths." *Genetic Engineering & Biotechnology News* **2014**, 34(15).
- [4] "Solving biofuels' redox equation." *Chemical & Engineering News* **2014**, 92, 6.
- [5] Press release on redox in photoautotrophic cyanobacteria research: <http://www.pnnl.gov/news/release.aspx?id=1024>. Reported at >30 media outlets including *R&D Magazine*, *Phys.org*, and *Nanowerk*.
- [6] Press release on microbial lignocellulose degradation research: <http://www.pnnl.gov/news/release.aspx?id=1018>. Reported at >30 media outlets including *Bloomberg*, *Greenwire*, *Science Daily*, and *Biofuels Journal*.
- [7] Press conference, American Chemical Society National Meeting, Fall 2013. <http://www.ustream.tv/recorded/38594429>. Reported at >30 media outlets including the *Huffington Post* and *Science Daily*.
- [8] "Shifting sensibilities in molecular sensors." *Chemical & Engineering News* **2006**, 84, 41-42.

Scientific Service

- [1] 2015-Present. Chair, Environmental Microbiology Committee, Society for Industrial Microbiology & Biotechnology.
- [2] 2016. Planning committee and session convener for the international meeting of the International Society for Microbial Ecology.
- [3] 2015-2016. Session convener at the annual meetings of the Society for Industrial Microbiology & Biotechnology.
- [4] 2015. Committee member for the UC Berkeley FutureBio Institute planning meeting.
- [5] Reviewer for *Nature* journals, including *Nature Biotechnology* and *Nature Chemical Biology*.
- [6] Reviewer for American Chemical Society journals, including *ACS Chemical Biology*, *Journal of the American Chemical Society*, and the *Journal of Proteome Research*.

- [7] Reviewer for the Royal Society of Chemistry journals, including *Chemical Communications*, *Molecular BioSystems*, and *Chemical Science*.
- [8] Reviewer for PLoS journals, including *PLoS One* and *PLoS Biology*.

Affiliations

Member of the American Chemical Society (Regional & National sections) and the Society for Industrial Microbiology & Biotechnology.