Christina M. Payne, PE, PhD
Adjunct Associate Professor of Chemical Engineering | University of Kentucky
Program Director | National Science Foundation
2415 Eisenhower Ave. | Alexandria, VA 22314
Phone: (703) 292-2895 | christy.payne@uky.edu | cpayne@nsf.gov

PROFESSIONAL PREPARATION:

Tennessee Technological University, Cookeville, TN	Chemical Engineering	B.S., 2002
Vanderbilt University, Nashville, TN	Chemical Engineering	Ph.D., 2007
National Renewable Energy Laboratory, Golden, CO	Biosciences Center	01/2011-11/2011

APPOINTMENTS:

2018 – present	Program Director, *Molecular Separations*, National Science Foundation
2018	Acting Program Director, *Engineering of Biomedical Systems* and *Disability and Rehabilitation Engineering*, National Science Foundation
2017 – present	Adjunct Associate Professor, University of Kentucky
2017 – 2018	Associate Program Director, National Science Foundation
2012 – 2017	Assistant Professor, University of Kentucky
2013 – 2017	August T. Larsson Guest Researcher, Swedish Univ. of Agricultural Sciences
2012 – 2017	Assistant Professor of Chemical Engineering, University of Kentucky
2011 – 2012	Research Scientist, National Renewable Energy Laboratory (NREL)
2011	Postdoctoral Research Associate, NREL
2008 – 2011	Process Engineer, URS
2005	DOE Computational Science Intern, Sandia National Laboratory
2003 – 2007	DOE Computational Science Graduate Fellow, Vanderbilt University
2002 – 2006	IBM Fellow, Vanderbilt University

PRODUCTS: (*Corresponding)

Closely related products

1. I. Geronimo, C. A. Denning, D. K. Heidary, E. C. Glazer*, and C. M. Payne*, "Molecular determinants of substrate affinity and enzyme activity of a cytochrome $P450_{BM3}$ variant," *Biophys. J.*, **115(7)**, 1251-1263 (2018).
2. I. Geronimo, C. M. Payne*, and M. Sandgren*, "Hydrolysis and transglycosylation transition states of glycoside hydrolase Family 3 β-glucosidases differ in charge and puckering conformation," *J. Phys. Chem. B*, **122(41)**, 9452-9459 (2018).
3. A. A. Kognole and C. M. Payne*, "Inhibition of mammalian glycoprotein YKL-40: Identification of the physiological ligand," *J. Biol. Chem.*, **292(7)**, 2624-2636 (2017).
4. S. Jana, A. G. Hamre, P. Wildberger, M. M. Holen, V. G. H. Eijsink, G. T. Beckham, M. Sørlie*, and C. M. Payne*, "Aromatic-mediated carbohydrate recognition in processive *Serratia marcescens* chitinases," *J. Phys. Chem. B*, **120(7)**, 1236-1249 (2016)
5. A. A. Kognole and C. M. Payne*, "Cello-oligomer binding dynamics and directionality in Family 4 carbohydrate binding modules," *Glycobiology*, **25(10)**, 1100-1111 (2015)

Other significant products

1. C. M. Payne, B. C. Knott, H. Mayes, H. Hansson, M. Sandgren, J. Ståhlberg, M. E. Himmel, and G. T. Beckham, "Fungal cellulases," *Chem. Rev.*, 115(3), 1308-1448 (2015). doi:10.1021/cr500351c
2. J. V. Vermaas, M. F. Crowley, G. T. Beckham, and C. M. Payne*, "Effects of lytic polysaccharide monooxygenase oxidation on cellulose structure and binding of oxidized cellulose oligomers to cellulases," *J. Phys. Chem. B.*, **119(20)**, 6129-6143 (2015) doi:10.1021/acs.jpcb.5b00778
3. G. T. Beckham, J. Ståhlberg, B. C. Knott, M. E. Himmel, M. F. Crowley, M. Sandgren, M. Sørlie, and C. M. Payne*, "Towards a molecular-level theory of carbohydrate processivity in glycoside

hydrolases," *Curr. Opin. Biotechnol.*, **27**, 96-106 (2014). doi:10.1016/j.copbio.2013.12.002
4. C. M. Payne, M. G. Resch, L. Chen, M. F. Crowley, M. E. Himmel, L. E. Taylor, M. Sandgren, J. Ståhlberg, I. Stals, Z. Tan, and G. T. Beckham, "Glycosylated linkers in multi-modular lignocellulose degrading enzymes dynamically bind to cellulose," *Proc. Natl. Acad. Sci. U.S.A.*, **110**, 14646-14651 (2013). doi:10.1073/pnas.1309106110
5. C. M. Payne*, W. Jiang, M. R. Shirts, M. E. Himmel, M. F. Crowley, and G. T. Beckham, "Glycoside hydrolase processivity is directly related to oligosaccharide binding free energy," *J. Am. Chem. Soc.*, **135(50)**, 18831-18839 (2013). doi:10.1021/ja407287f

SYNERGISTIC ACTIVITIES:

1. Actively mentoring 20+ high school students at T. C. Williams High School (Alexandria, VA) in preparation and conduct of science fair projects; 2018 to present
2. Developed hands-on enzymatic conversion workshop for grade 4-6 girls as part of the Girl Scouts of Kentucky Girls in Engineering, Math, and Science Event; 2014/15/16
3. Demonstrated shape memory materials to middle school-age girls as part of the Girl Scouts of Kentucky Girls in Engineering, Math, and Science Event; 2013
4. Organized hands-on protein folding demonstration for the general public at the UK Engineering-day annual event – reaches hundreds of local Lexington residents; 2013 through 2016
5. Conference organization: *AIChE Annual Meeting* – "Thermodynamics of Energy Systems" 2011 Co-chair 2011 and Chair 2012; "Multiscale and Molecular Modeling for Renewable Energy Systems" Co-chair 2013; "Thermophysical Properties of Biological Systems" Chair 2013 to 2016; *35th Symp. on Biotech. for Fuels and Chemicals* – "Enzyme Science and Technology" Co-chair 2013