

Hugh M. Purdy, Ph.D.

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Education

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| University of Wisconsin-Madison | Ph.D. | Chemical Engineering | 2014-2021 |
| Dissertation Title: <i>The Design and Engineering of Microbial Metabolism Using Constraint-Based Models</i> | | | |
| University of Arkansas | B.S. | Chemical Engineering | 2010-2014 |

Research Experience

University of California Santa Barbara, Chemical Engineering, Santa Barbara, CA 2021-present
Postdoctoral Scholar, Advisor: Professor Michelle A. O'Malley

- Conducting research characterizing and engineering the genetic mechanisms of diatom cell-wall silicification, with a focus on the materials aspects of frustule morphology.

University of Wisconsin-Madison, Chemical & Biological Engineering, Madison, WI 2014-2021
Ph.D. Candidate, Advisors: Professors Jennifer L. Reed & Brian F. Pfleger

- Carried out several projects in the field of systems metabolic engineering, including the model-guided engineering of a cyanobacterium to create an improved strain-background for branched-chain alcohol production and the development of a workflow to identify novel biochemical pathways for producing non-biological commodity compounds.

University of Arkansas, Chemical Engineering, Fayetteville, AR 2011-2014
Undergraduate Researcher, Advisor: Professor Shannon L. Servoss

- Performed combinatorial synthesis and screening of peptoids (peptidomimetic compounds) to identify ligands for targeting cancer-associated cell receptors.

Cornell University, Cornell Center for Materials Research, Ithaca, NY Summer 2013
REU Participant, Research Mentor: Professor Christopher K. Ober

- Developed a protocol for adapting an automated peptide synthesizer to create highly monodisperse polyamides for study as antifouling agents.

Research Publications

H.M. Purdy, B.F. Pfleger, and J.L. Reed, 'Introduction of NADH-Dependent nitrate assimilation in *Synechococcus* sp. PCC 7002 improves photosynthetic production of 2-methyl-1-butanol and isobutanol', *Metabolic Engineering* (2022), 69: 87-97.

J. Kim, M. Tremaine, J.A. Grass, **H.M. Purdy**, R. Landick, P.J. Kiley, and J.L. Reed, 'Systems Metabolic Engineering of *Escherichia coli* Improves Coconversion of Lignocellulose-Derived Sugars', *Biotechnology Journal* (2019), 14: 1800441.

R.L. Clark, L.L. McGinley, **H.M. Purdy**, T.C. Korosh, J.L. Reed, T.W. Root, and B.F. Pfleger, 'Light-Optimized Growth of Cyanobacterial Cultures: Growth Phases and Productivity of Biomass and Secreted Molecules in Light-Limited Batch Growth', *Metabolic Engineering* (2018), 47: 230-242.

H.M. Purdy and J.L. Reed, 'Evaluating the Capabilities of Microbial Chemical Production Using Genome-Scale Metabolic Models', *Current Opinion in Systems Biology* (2017), 2: 90-96.

Selected Research Presentations

'Model-Guided Engineering of Cyanobacteria for C4-C5 Alcohol Production', Oral presentation at the American Institute of Chemical Engineers National Meeting, Orlando, FL, November 8-15, 2019. Co-authors: J.L. Reed

'De Novo Prediction of Metabolic Pathways for Synthesizing Novel Bioproducts', Poster presentation at the Great Lakes Bioenergy Research Center's Annual Science Meeting, Lake Geneva, WI, May 21-23, 2019. Co-authors: J.L. Reed

'Engineering Cyanobacteria for Improved Biofuel Production', Poster presentation at the 5th Conference on Constraint-Based Reconstruction and Analysis (COBRA), Seattle, WA, October 14-16, 2018. Co-authors: J.L. Reed

'Computational Analysis of Microbial Metabolism for Fuel and Chemical Production', Poster presentation at the DOE Genomic Science Program's Annual PI Meeting, Tysons, VA, March 6-9, 2016. Co-authors: X. Zhang, C.J. Tervo, T.T. Vu, and J.L. Reed.

Selected Awards and Fellowships

UW Genomic Sciences Training Program Traineeship

June 2017-May 2020

- Competitive traineeship funding graduate research in a broad range of genomics-related disciplines (NIH Institutional Training Grant T32HG002760)

University of Arkansas Honors College Research Grants

June 2011-May 2014

- Grants provided by the UofA Honors College to support independent undergraduate research.

University of Arkansas Honors College Fellowship

August 2010-May 2014

- Large fellowship awarded by UofA providing full financial support for four years of undergraduate study.

Teaching Experience

Guest Lecturer for “Biochemical Engineering” course (UW-Madison CBE560)

Fall 2018 & '19, Spring '21

Teaching Assistant for “Transport Phenomena Lab” course (UW-Madison CBE324)

Spring 2017

Teaching Assistant for “Mass Transfer Operations” course (UW-Madison CBE426)

Spring 2016