James Jeffryes

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Education

Doctor of Philosophy
2017(anticipated)

Northwestern University Evanston, IL
Chemical Engineering, Advised by Keith Tyo & Christopher Henry

Bachelor of Science
May 2012

Rose-Hulman Institute of Technology Terre Haute, IN
Chemical Engineering & Biochemistry and Molecular Biology, *Magna Cum Laude*

Experience

Current
Dec 2012

Graduate Research Assistant at Northwestern University
Chemical and Biological Engineering, Evanston, Il

- Collaborated with a diverse team of plant biologists and analytical chemists to uncover novel enzyme functions.
- Generated computational predictions of enzymatic activity to build a database of potential biosynthetic targets.
- Implemented a Python API to enable database integration into Department of Energy Biological Knowledge Base.
- Co-developed and maintained a web application at minedatabase.mcs.anl.gov to facilitate broad use of the metabolite database.

Summer 2011

Summer Research Student at Colorado St. University
Colorado Center for Biofuels and Biorefining, Fort Collins, CO

- Constructed an astaxanthin synthesis pathway in *E. coli* with cloning techniques and performed homologous recombination in *Synechocystis*.
- Adapted a carotenoid extraction protocol for *Synechocystis* to enable quantitative HPLC analysis.

Nov 2010 - Oct 2011

Chapter President at Pi Kappa Alpha Fraternity
Iota Delta Chapter, Terre Haute, IN

- Served as the chief executive officer of an organization of over 100 members and an annual budget of nearly a quarter million dollars.
- Conceived and implemented a reorganization of chapter leadership structure.

Summer 2010

Summer Research Student at Rice University
Center for Biorenewable Chemicals, Houston, TX

- Assisted in construction of novel *E. coli* strains for production of lucrative biofuels and biochemicals through transduction and transformation
- Characterized strains by use of growth curves and metabolite analysis

Awards and Honors

2015 **NIH Travel Award**
Metabolomics Society

2014 - 2015 **Fellowship in Leadership**
Northwestern University

2013 **Outstanding Teaching Assistant Finalist**
Northwestern University

2012 **Greek of the Year**
Rose-Hulman Institute of Technology

2011 **Outstanding Poster Presentation**
Center for Biofuels and Biorefining

Research Communication

Publications

1. O. Frelin, L. Huang, G. Hasnain, **J. Jeffryes**... A. Hanson "A novel directed-overflow and damage-control N-glycosidase in riboflavin biosynthesis." *Biochem. J.* **466**, 137-145 (2015)
2. **J. Jeffryes**, R. Colestani, M. El-Badawi, T. Kind... C. Henry "MINEs: Open access databases of computationally predicted enzyme promiscuity products for untargeted metabolomics" *J. Cheminformatics* Under Review
3. C. Lerma-Ortiz*, **J. Jeffryes*,**, A. Cooper... C. Henry & A. Hanson "Nothing of chemistry disappears in biology": The Top 30 damage-prone metabolites *Biochem. J.* In Preparation ***these authors contributed equally to this work**

Book Chapters

1. **J. Jeffryes**, S. Seaver, P. J. Edirisinghe & C. Henry "Metabolic Modeling of Microbial Communities" *Hydrocarbon and Lipid Microbiology Protocols* (Springer) In Preparation

Conferences

1. **J. Jeffryes**, R. Colestani, M. El-Badawi, T. Kind... C. Henry *MINEs: Open access databases of computationally predicted enzyme promiscuity products for untargeted metabolomics* Oral Presentation at **Metabolomics 2015** conference. July, 2, 2015
2. **J. Jeffryes**, R. Colestani, K. Tyo & C. Henry *MINEing Computationally Predicted Enzyme Promiscuity Products for Untargeted Metabolomics* Oral Presentation at **American Institute of Chemical Engineering Midwest Regional Conference**. March 12, 2015
3. **J. Jeffryes**, S. Albers & C. Peebles *Toward synthesis and detection of astaxanthin in Synechocystis* Poster presentation at **American Institute of Chemical Engineering National Meeting**. October 17. 2011

Technical Skills

Cheminformatics	Python, ChemAxon Marvin suite, OpenBabel, Chemical fingerprinting
Data Science	MongoDB, uWSGI, Weka, Graph theory, Machine learning, Parallel computing
Web Development	JavaScript, AngularJS, Bootstrap, Protractor E2E Testing

Teaching Experience

Workshop Instructor	Developed and taught a 2-day workshop on cheminformatics and MINE database for graduate students, postdoctoral fellows, and faculty from University of Florida and University of California-Davis
Teaching Assistant	Kinetics, Energetics & Bioreactor Design, 3 quarters. Paradigms & Strategies of Leadership, 1 quarter
Research Mentor	Advised Tom Aunins, a Chemical Engineering undergraduate student, in writing a successful Undergraduate Research Grant application and conducting summer research.
Leadership Coach	Worked with undergraduate students to identify and overcome leadership challenges in their organizations though one-on-one mentoring organized by Northwestern's Center for Leadership.

Service

Northwestern University

2014-Current	**Departmental Representative**, Graduate Leadership and Advocacy Council
2014	**Planning Committee**, Thodos-Hulbert Professional Skills Development Day
2013-2014	**Board-member**, Chemical & Biological Engineering Graduate Student Forum

Other

2014-Current	**Co-Founder & Chapter Liaison**, Iota Delta Chapter Educational Foundation
2014-Current	**Volunteer Tax Preparer & Site Assistant**, Center for Economic Progress