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 Argonne National Laboratory
Mathematics And Computer Science Division, Lemont, Il

- Collaborated in a cross-functional team including plant biologists and analytical chemists to uncover novel enzyme functions and the resulting metabolic products.
- Generated computational predictions of enzymatic and spontaneous chemical activities to build a searchable databases of putative metabolites.
- Implemented a API in Python to enable database integration into Department of Energy Biological Knowledge Base and 3rd party workflows.
- 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 a partial 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 growth and metabolite profiles

Technical Skills

Cheminformatics	Chemical fingerprinting & property calculation, ChemAxon suite, OpenBabel, RDKit
Programming	Python, JavaScript, SQL, C#
Data Science	MongoDB, Machine learning with *scikit-learn* & *pandas*, Cluster computing
Web Development	API specification & implementation, AngularJS, Bootstrap, Protractor E2E Testing

Selected Awards

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

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* **7**:44 (2015)
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.* Submitted ***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 **11th International Conference of the Metabolomics Society** 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

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 University's Center for Leadership.