James Jeffryes

2129 Sherman Ave, Evanston, IL 60201
(303) 882-5262
jamesgjeffryes@gmail.com
www.jamesjeffryes.com

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

Since
Mar 2013

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.

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

Data Science	Machine learning with *scikit-learn* & *pandas*, Cluster computing, MongoDB, SQL
Bioinformatics	Metabolomics, *In silico* metabolic pathway construction, Flux balance analysis, Python
Cheminformatics	Chemical fingerprinting, Chemical property prediction, ChemAxon suite, OpenBabel, RDKit
Web Development	API specification & implementation, JavaScript, AngularJS, Protractor E2E Testing

Selected Awards

2016 **Kemin Travel Award**
Kemin Industries

2015 **NIH Travel Grant**
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. Soc. Trans.* **44**, 961-71 (2016) **these authors contributed equally to this work*
4. D. Pertusi, M. Moura, **J. Jeffryes** & K. Tyo "Elucidating substrate-level enzymatic promiscuity using cheminformatic methods" *PLOS Comp. Bio.* Submited

Conferences

1. **J. Jeffryes**, C. Lerma-Ortiz, T. Niehaus... C. Henry *Mining metabolism for unannotated enzymatic functions and serendipitous metabolic pathways* Poster Presentation at **Metabolic Engineering 11** June 27, 2016
2. **J. Jeffryes**, C. Lerma-Ortiz, A.J. Cooper... C. Henry *Detection of novel metabolites and enzyme functions through in silico expansion of metabolic models* Oral Presentation at **251st American Chemical Society National Meeting & Exposition** March 13, 2016
3. **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

Teaching Experience

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.
Workshop Instructor	Developed and taught a 2-day workshop on cheminformatics and MINE databases for graduate students, postdoctoral fellows, and faculty from University of Florida and University of California-Davis
Research Mentor	Advised Tom Aunins, a Chemical Engineering undergraduate student, in writing a successful Undergraduate Research Grant application and conducting summer research.
Teaching Assistant	Kinetics, Energetics & Bioreactor Design, 3 quarters. Paradigms & Strategies of Leadership, 1 quarter Computational Biology, 1 quarter