Matsen Janet

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EDUCATION

UNIVERSITY OF WASHINGTON

PhD in Chemical Engineering
[Expected Dec 2016]
Metabolic Engineering
Pathway Design
Advanced Data Science
Chemical Engineering
Bioreactor Operation

UC BERKELEY

BS in Chemical Engineering
2006-2010
Cum. GPA: 3.55
Chemical Engineering, UC Berkeley
Cellulosic Ethanol Research
Fermentation Theory
Kinetics and Reactor Design

LINKS

Github:// **janetmatsen**
LinkedIn:// **janetmatsen**
OpenWetWare:// **Janet_B._Matsen**

SKILLS

PROGRAMMING

Computational:
Python • R • ggplot2 • Shell • Git • Mercurial • Continuous Integration • LaTeX
Wet Lab:
Gibson Cloning • Enzyme Evolution • Enzyme Assays • Mass Spectrometry • HPLC/UPLC •

RESEARCH

CHEMICAL ENGINEERING: LIDSTROM LAB | PhD Candidate

August 2010 – present | Seattle, WA

- Major Project: Implementation of a novel carbon-fixation pathway, which included a computationally designed enzyme and three enzyme reactions not found in nature.
- New Project: Metagenomics and metatranscriptomics of a methane oxidizing community using collaborative programming, remote computing, machine learning, and visualization of complex biological data sets.
- Engineered a high throughput colorimetric screen for altered acetyl-CoA synthase specificity. Developed R code that takes raw kinetic data all the way to stratified plots. Built and assayed enzyme libraries including rational and random mutations.
- Demonstrated efficacy of genetic tools for a non-model methylotrophic organism for use in high throughput enzyme selections. Identified a set of promoters with varying strengths, knocked out chromosomal genes, and expressed heterologous enzymes.
- Developed an R code that converts primer lists to APE Annotation Feature Library files, allowing matching of existing primers to new DNA sequences and primer sharing.
- Growth curve analysis in R. High throughput growth rate analysis for bacteria grown in different media in a Bioscreen-C machine. Extracted doubling times, plotted with ggplot2.
- Initiated the Lidstrom Lab's OpenWetWare pages that document best practices for numerous protocols. Top two most popular pages: Guide to Gibson Assembly (47,000 hits), SDS-PAGE (40,000 hits). Contributed 27,000 edits across dozens of pages.
- Mentored an undergraduate Chemical Engineering student over the course of a year. She can now screen hundreds of enzyme variants per week, and do directed evolution independently.
- Advised by Mary Lidstrom, David Baker, and David Beck.
- Advanced Data Science certificate in progress.

EXPERIENCE

ARZEDA | Computational Pathway Design Intern

July 2015 – Sept. 2015 | Seattle, WA

- Designed strategies for high-throughput theoretical and pathway yield calculations. Implemented as Python modules that continue to be used and extended.
- Contributed to discovery of a metabolic pathway for production of a valuable chemical; patent being filed.

ABBOTT | Fermentation Recovery Intern

Summer 2009 | North Chicago, IL

- Engineering support for fermentation recovery in an erythromycin production plant.
- Analysis of an aeromatic dryer that processes $7.5M of antibiotics per year.
- Developed and implemented measures to improve reliability, reduce maintenance costs, and prepare for disasters.
- Guided an all-day interdisciplinary analysis of failure modes.
- Produced department finance reports and energy savings audits.

UC BERKELEY | Cellulosic Ethanol

Honors Research, Radke Lab, 2009.

- Obtained kinetic parameters for the cellulase driven decomposition of cellulose and optimized production of model cellulose films.

PAPERS

Global molecular analyses of methane metabolism in methanotrophic alphaproteobacterium, Methylosinus trichosporium OB3b. Part I: transcriptomic study.
Matsen, J. B., Yang, S., Stein, L. Y., Beck, D., & Kalyuzhnaya, M. G. (2013).
Frontiers in microbiology. Open Access, doi: 10.3389/fmicb.2013.00040

Global molecular analyses of methane metabolism in methanotrophic Alphaproteobacterium, Methylosinus trichosporium OB3b. Part II. Metabolomics and 13C-labeling study.
Yang, S., Matsen, J. B., Konopka, M., Green-Saxena, A., Clubb, J., Sadilek, M., Orphan VJ, Beck D, & Kalyuzhnaya, M. G. (2013).
Frontiers in microbiology. Open Access, doi: 10.3389/fmicb.2013.00070

OUTREACH

2012-15	Outreach Chair: Puget Sound chapter of American Institute of Chemical Engineers
2010,11,15	UW Engineering Discovery Days Organizer or Volunteer
2015	Judge: Washington State Science Fair
2015	Expanding your Horizons Workshop Leader
2011	Weekly Science Fair mentor: Bryant Elementary
2010-11	Outreach Chair: Association of Chemical Engineering Graduate Students

SOCIETIES

2014-15	PyLadies Seattle
2013-15	Association of Women in Science
2012-15	American Institute of Chemical Engineers
2014-15	Women in Bio