

CAROLINE B. MILNE

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EDUCATION

2007 **Cornell University, Ithaca, NY**
B.S. (Cum Laude), Chemical and Biomolecular Engineering; GPA: 3.63

Pres. **University of Illinois, Urbana-Champaign, IL**
Pursuing Ph.D., Chemical and Biomolecular Engineering; GPA: 3.78

RESEARCH EXPERIENCE

2007-pres. **Graduate Research Assistant**
The Research Group for Computational and Systems Biology, University of Illinois
PI: Dr. Nathan D. Price

- Reconstructed metabolic network and built genome-scale model for *Clostridium beijerinckii*; validated model by collecting and analyzing batch fermentation data
- Using model to guide strain design for improved butanol production
- Profiling metabolome of *C. beijerinckii* for integration with model

2005-2007 **Undergraduate Research Assistant**
Biomass Conversion Laboratory, Cornell University
PI: Dr. Larry P. Walker

- Designed, performed and analyzed experiments to determine binding mechanism and optimal cellulase enzyme mixture for cellulose conversion to ethanol
- Developed detailed recommendation of design and experiments to produce kilogram sized quantities of pretreated biomass material using liquid hot water
- Created MATLAB model to track flow of mass through pretreatment, hydrolysis and fermentation steps of ethanol production from cellulose

INDUSTRY EXPERIENCE

2006 **Process Development Intern**
Clorox Technical Center, Pleasanton, CA

- Developed biocidal formulation and processing method for new cleaning product
- Presented project plan, progress and recommendations to senior management at technical reviews

2005 **Laboratory Assistant**
Massachusetts Department of Environmental Protection/NESCAUM

- Managed all ambient air samples brought in for testing
- Used chemical extraction to prepare ambient air samples for analysis
- Analyzed extracted air samples using liquid chromatography (HPLC)

HONORS AND AWARDS

- 2009-2011 Chemistry Biology Interface Training Grant
2008 NSF Graduate Research Fellowship Honorable Mention Recipient
2008 University of Illinois Fall 2008 Conference Travel Award from the Graduate College
2007 NIH Molecular Biology Training Grant Recipient (turned down offer)
2006 Cvorstell Engineering Diversity Programs scholarship recipient, funded by General Motors
2006 SWE scholarship recipient, funded by General Electric's Women's Network

PUBLICATIONS

Milne, CB, Eddy, JA, Raju, R, Ardekani, S, Kim, PJ, Senger, RS, Jin, YS, Blaschek, HP, Price, ND: Metabolic network reconstruction and genome-scale model of butanol-producing strain *Clostridium beijerinckii* NCIMB 8052. Accepted to BMC Systems Biology.

Milne CB, Kim PJ, Eddy JA, Price ND: Accomplishments in genome-scale in silico modeling for industrial and medical biotechnology. *Biotechnol J* 2009.

Ezeji T, **Milne C**, Price ND, Blaschek HP: Achievements and perspectives to overcome the poor solvent resistance in acetone and butanol-producing microorganisms. *Appl Microbiol Biotechnol* 2009.

ORAL PRESENTATIONS

"Metabolic network reconstruction and genome-scale model of butanol-producing strain *Clostridium beijerinckii* NCIMB 8052." Biomedical Engineering Society (BMES) Annual Fall Meeting. October 2011. Hartford, CT.

"Metabolic network reconstruction and genome-scale model of butanol-producing strain *Clostridium beijerinckii* NCIMB 8052." American Institute of Chemical Engineers (AIChE) Annual Meeting. October 2011. Minneapolis, MN.

"Metabolic network reconstruction and genome-scale model of butanol-producing strain *Clostridium beijerinckii* NCIMB 8052." Society of Industrial Microbiology (SIM) Annual Meeting. July 2011. New Orleans, LA.

"Metabolic network reconstruction and genome-scale model of butanol-producing strain *Clostridium beijerinckii* NCIMB 8052." *Clostridium* 11. October 2010. San Diego, CA.

"Metabolic reconstruction and analysis of hyper-butanol producing strain *Clostridium beijerinckii*." American Institute of Chemical Engineers (AIChE) Annual Meeting. November 2009. Nashville, TN.

"Metabolic reconstruction and analysis of hyper-butanol producing strain *Clostridium beijerinckii*." Biomedical Engineering Society (BMES) Annual Fall Meeting. October 2008. St. Louis, MO.

GRANTS AND PEER REVIEWS

- 2011** Assisted in preparation of DOE Early Career Research Program application
Title: Integrated regulatory-metabolic network modeling and strain optimization of *Clostridium beijerinckii* for enhanced butanol production; *PI: Nathan D. Price*

- 2008** **Assisted in preparation of NSF CAREER Award application**
Title: Systems biology and engineering of *Clostridium beijerinckii* for enhanced butanol production; *PI: Nathan D. Price*
- 2007-pres.** Assisted with peer reviews of manuscripts for BMC Bioinformatics, PLoS Computational Biology, AIChE Journal, IET Systems Biology, Molecular Systems Biology

TEACHING AND MENTORING EXPERIENCE

- 2008-pres.** **Mentor for over 10 (in total) undergraduate research assistants**
The Research Group for Computational and Systems Biology, University of Illinois
PI: Dr. Nathan D. Price
- 2010** **Systems Biology Tutor**
University of Illinois, Urbana-Champaign
- 2008-2009** **Teaching Assistant**
University of Illinois, Urbana-Champaign
- Process Dynamics & Control (2009)
 - Systems Biology (2009)
 - Momentum & Heat Transfer (2008)

LEADERSHIP EXPERIENCE AND ACTIVITIES

- 2010-2011** **Stillwater Landing Condo Association Board of Directors**
Stillwater Landing, Urbana, IL
- Condo Association President: led monthly meetings, managed budget, cooperated with banks and realtors, sought legal advice, managed maintenance needs
 - Condo Association Administrative Vice President
- 2008-2010** **International Genetically Engineered Machine (iGEM) competition Graduate Adviser**
University of Illinois, Urbana Champaign (Adviser: Nathan D. Price)
- 2008-2009** **Adopt-a-family volunteer**
Crisis Nursery, Urbana, IL
- 2008-2009** **University of Illinois Chemical and Biomolecular Engineering Graduate Student Advisory Council (GSAC)**
Community Service Officer (2008-2009)
- Organized and facilitated Illini Jamboree Boy Scout department lab tours
 - Led fall food drive to benefit Eastern Illinois Foodbank
 - Organized gift collection to support the local Crisis Nursery adopt-a-family program during holiday season
- 2008-2009** **Institute for Genomic Biology Social Committee**
- Worked with other committee members to organize monthly events to encourage networking across research themes for the Institute for Genomic Biology

2003-2007 Society of Women Engineers

Co-Director of Outreach (2005-2006)

- Worked with outreach chairs to organize six outreach events to educate younger students about schooling and careers in engineering

Co-chair of Prospective Candidates Weekend (2003 – 2006)

- Organized and managed panels, tours, meals with faculty and an overnight stay for prospective female engineering students

2003-2007 Cornell Engineering Ambassadors

- 2006-2007 Co-chair, organized orientation for new members in 2005 & 2006
- Improved process for accepting new members and training current members
- Give tours, run info sessions, panels and lunches for prospective students

2006 LeaderShape Institute

Participated in the 2006 LeaderShape Institute hosted by Cornell University

- Learned essential leadership skills such as communication, listening, vision and teamwork through a one week intensive leadership training session