

CONTACT INFORMATION      *Location:* Golden, CO 80401  
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EXPERIENCE      **National Renewable Energy Lab** (2015 - Present)

*Postdoctoral Scholar*

- Developed models of microbial metabolism to determine means of improving product yields through genetic engineering.
- Used dynamic optimization and optimal control to develop a technique for estimating the maximum theoretical productivity of a batch culture system.
- Used machine learning techniques to develop a model to predict the tendency of a molecule to form soot from directly from its structure.

EDUCATION      **University of California, Santa Barbara** (2010-2015)

*Ph.D., Department of Chemical Engineering, Santa Barbara, California*

- Thesis: Mathematical Approaches to Understanding Mammalian Circadian Rhythms.
- Advisor: Francis J. Doyle III
- GPA: 3.68

**Tufts University** (2006 - 2010)

*BS, Chemical and Biological Engineering, Medford, Massachusetts*

- GPA: 3.79
- Awards: Summa Cum Laude, Thesis Honors, Dean's List every semester.

HONORS AND AWARDS

- AIChE CAST Student Travel Grant, *September 2014*
- Society for Research on Biological Rhythms (SRBR) Research Merit Award, *June 2014*
- Best Poster, Center for Chronobiology Symposium, UCSD, *February 2014*
- 1<sup>st</sup> Place, Society for Research on Biological Rhythms Logo Competition, *January 2014*
- Mitsubishi Chemical Fellowship Recipient, *2012-2015*
- UCSB Scienceline 2011-2012 Life Science Outstanding Answerer, *June 2012*
- National Science Foundation GRFP Honorable Mention, *April 2011*
- Class of 1947 Victor Prather Prize, *May 2010*
- Max Tischler Prize Scholarship, *May 2009*
- Elected to Tau Beta Pi, *September 2008*

PUBLICATIONS

**Journal articles**

**St. John, P. C.**, Crowley, M. F., & Bomble, Y. J. (2017). Efficient estimation of the maximum metabolic productivity of batch systems. *Biotechnology for Biofuels*, 10(1). doi:10.1186/s13068-017-0709-0

Salvachúa D., Smith, H., **St. John, P.C.**, Mohagheghi, A., Peterson, D.J., Black, B.A., Dowe, N., and G.T. Beckham. Succinic acid production from lignocellulosic hydrolysate by *Basfia succiniciproducens* (2016) *Bioresource Technology*, (214) pp. 558-566. 10.1016/j.biortech.2016.05.018

Abel, J.H., Meeker, K., Granados-Fuentes, D., **St. John, P.C.**, Wang, T.J., Bales, B.B., Doyle F.J. III, Herzog, E.D., and L.R. Petzold. Functional network inference of the suprachiasmatic nucleus (2016) *PNAS*, 113 (16) pp. 4512-4517 10.1073/pnas.1521178113

**St. John, P.C.** and F.J. Doyle III. Quantifying stochastic noise in cultured circadian reporter cells (2015) *PLoS Computational Biology* 11 (11): e1004451. 10.1371/journal.pcbi.1004451

Abel J.H., Widmer L.A., **St. John, P.C.**, Stelling J., and F.J. Doyle III. A Coupled Stochastic Model Explains Differences in Cry Knockout Behavior (2015) *IEEE Life Sciences Letters* 1 (1), 3-6. 10.1109/LLS.2015.2439498

**St. John, P.C.**, Taylor, S.R., Abel, J.H., and F.J. Doyle III. Amplitude metrics for cellular circadian bioluminescence reporters (2014) *Biophysical Journal*, 107 (11) pp. 2712-2722 10.1016/j.bpj.2014.10.026

**St. John, P.C.**, Hirota, T., Kay, S.A. and F.J. Doyle III. Spatiotemporal separation of PER and CRY posttranslational regulation in the mammalian circadian clock (2014) *PNAS*, 111 (5) pp. 2040-2045. 10.1073/pnas.1323618111

**St. John, P.C.** and F.J. Doyle III. Estimating confidence intervals in predicted responses for oscillatory biological models (2013) *BMC Systems Biology* 7:71. 10.1186/1752-0509-7-71

Hirota, T., Lee, J.W., **St. John, P.C.**, Sawa, M., Iwaisako, K., Noguchi, T., Pongsawakul, P.Y., Sonntag, T., Welsh, D.K., Brenner, D.A., Doyle, F.J. III, Schultz, P.G., Kay, S.A., Identification of small molecule activators of cryptochrome (2012) *Science*, 337 (6098) pp. 1094-1097. 10.1126/science.1223710

Murphy, A.M., **St. John, P.C.**, and D.L. Kaplan. Modification of silk fibroin using diazonium coupling chemistry and the effects on hMSC proliferation and differentiation (2008) *Biomaterials* 29 (19), 2829-2838. 10.1016/j.biomaterials.2008.03.039

### Book Chapters

Yang R., Rodriguez-Fernandez, M., **St. John, P.C.**, and F.J. Doyle III. Systems Biology (2014) in *Modelling Methodology for Physiology and Medicine (Second Edition)* Elsevier, Oxford, p. 159-187.

## PRESENTATIONS

### Seminars

Mathematical Approaches to Understanding Mammalian Circadian Rhythms. November 2015. AMS Colloquium, Colorado School of Mines, Golden CO

### Conference Presentations

**St. John, P.C.**, Crowley, M.F., Bomble, Y.J. November 2016. Efficient Estimation of Maximum Theoretical Productivity from Batch Cultures Via Dynamic Optimization of Flux Balance Models. To be presented at the 2016 AIChE Annual Meeting, San Francisco, CA

**St. John, P.C.**, and F.J. Doyle III. November 2014. Development of Amplitude Response Curves for Single-Cell and Population-Level Circadian Systems. Presented at the 2014 AIChE Annual Meeting, Atlanta, GA

**St. John, P.C.**, and F.J. Doyle III. June 2014. Amplitude metrics for uncoupled cellular circadian bioluminescence reporters. Presented at the Society for Research on Biological Rhythms Meeting, Big Sky, MT

**St. John, P.C.**, and F.J. Doyle III. October 2012. Cryptochrome balancing for period control: mathematical insights into circadian clock design. Presented at the Model-based Analysis and Control of Cellular Processes Workshop, Purdue University, West Lafayette, IN

## TEACHING EXPERIENCE

### University of California, Santa Barbara

*Teaching Assistant, ChE132c*, Santa Barbara, California

Helped teach undergraduate statistics for two subsequent years: gave three lectures, held office hours and review sessions, and graded homeworks.

### University of California, Santa Barbara

*Teaching Assistant, ChE180a*, Santa Barbara, California

Designed and ran experiments for the junior laboratory course. Also helped in grading student reports.

COMMUNITY  
INVOLVEMENT

**Peer Review, January 2014-present**

Reviewer for PNAS; Biophysical Journal; Journal of Biological Rhythms; IEEE Control Systems Society Conference; 21st International Symposium on Mathematical Theory of Networks and Systems

**Scienceline “Ask A Scientist”**

Answers science and engineering questions posed by students and teachers from local K-12 schools.

**Website:** [www.scienceline.ucsb.edu](http://www.scienceline.ucsb.edu)

**UCSB Discover Engineering Weekend**

Helped organize and run a weekend for local high school students to learn basic engineering principles and apply their knowledge to build miniature alternative energy cars.

MENTORING  
EXPERIENCE

Paul Kairys, Undergraduate Student, NREL

Amanda Luan, Undergraduate Student, ICB SSB URAP

Lukas Widmer, Masters Student, ETH Zurich

Andrew Barisser, Rotation Student, BMSE UCSB

ADDITIONAL  
INFORMATION

*Website:* <http://www.nrel.gov/bioenergy/bios/peter-stjohn.html>

*Google Scholar:* <https://scholar.google.com/citations?user=NdWzcVMAAA>

*Github:* <https://github.com/pstjohn>