# Jonathan L. Robinson

National Bioinformatics Infrastructure Sweden
Department of Biology and Biological Engineering
Chalmers University of Technology
Kemivägen 10, SE-412 96, Gothenburg, Sweden
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## EDUCATION

**Princeton University** (Princeton, NJ, USA) *Jan. 2016*
Ph.D. Chemical and Biological Engineering
M.A. Chemical and Biological Engineering

**Colorado State University** (Fort Collins, CO, USA) *May 2010*
B.S. Chemical and Biological Engineering
B.S. Chemistry

## HONORS AND AWARDS

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|---|---|
| Visiting scholar at Faculty of Medicine Siriraj Hospital, Mahidol University | *2020* |
| Ruth L. Kirschstein National Research Service Award (NRSA) Postdoctoral Fellowship | *2018 – 2019* |
| Princeton Emerging Alumni Scholars Award | *2015* |
| National Science Foundation (NSF) Graduate Research Fellowship | *2011 – 2014* |
| Colorado State University Employee of the Year | *2010* |
| Department of Chemistry ACS Undergraduate Analytical Chemistry Award | *2010* |
| Department of Chemical & Biological Engineering Research Excellence Award | *2010* |
| Department of Chemical & Biological Engineering Academic Excellence Award | *2009* |
| Vincent Murphy Chemical Engineering Scholarship | *2009* |
| Chemical Engineering Alumni/Faculty Scholarship | *2008* |

## RESEARCH EXPERIENCE

**Bioinformatician** *Jan. 2020 – Present*
NATIONAL BIOINFORMATICS INFRASTRUCTURE SWEDEN
Science for Life Laboratory
Department of Biology and Biological Engineering
Chalmers University of Technology
Gothenburg, Sweden

**Postdoctoral Researcher** *Feb. 2016 – Dec. 2019*
CHALMERS UNIVERSITY OF TECHNOLOGY
Division of Systems and Synthetic Biology
Department of Biology and Biological Engineering
Gothenburg, Sweden
*Supervisor:* Dr. Jens Nielsen

**Graduate Research Assistant** *Jan. 2011 – Jan. 2016*
PRINCETON UNIVERSITY
Department of Chemical and Biological Engineering
Princeton, NJ, USA
*Thesis title:* Exploration of Bacterial Nitric Oxide Stress Responses as a Source of Antivirulence Targets
*Advisor:* Dr. Mark Brynildsen
*Thesis committee:* Dr. Ned Wingreen, Dr. Celeste Nelson, and Dr. Stanislav Shvartsman

**Undergraduate Research Assistant** *Dec. 2007 – Aug. 2010*
COLORADO STATE UNIVERSITY
Department of Chemical and Biological Engineering
Fort Collins, CO, USA
*Advisors*: Dr. Arthur Mayeno and Dr. Brad Reisfeld

## FUNDING SECURED

**Ruth L. Kirschstein National Research Service Award** [~160k USD / 3 years] *Feb. 2018 – Present*
U.S. National Institute of Health (NIH)

**Big Data SEED project** [640k SEK / 8 months] *Mar. 2017 – Oct. 2017*
Chalmers University Information & Communication Technology Area of Advance
*Co-applicants*: Jens Nielsen

**Graduate Research Fellowship Program fellowship** [~95k USD / 3 years] *Jun. 2011 – May. 2014*
U.S. National Science Foundation (NSF)

## TEACHING AND MENTORING EXPERIENCE

**Course Lectures**
CHALMERS UNIVERSITY OF TECHNOLOGY
- SysBio Writing Workshop (co-organizer, unofficial course) *Jul. 2018 – Oct. 2018*
- Systems Biology (guest lecturer; 6 lectures) *Nov. 2016, Oct. 2017, Oct. 2018*
- Metabolic Engineering (guest lecturer; 2 lectures) *Dec. 2017, Nov. 2018*
- Advanced Course on Metabolic Engineering and Systems Biology (guest lecturer; 2 lectures) *Jun. 2017, Aug. 2019*

**Graduate Teaching Assistant**
PRINCETON UNIVERSITY
- Fundamentals of Biofuels *Feb. 2015 – May 2015*
- Introduction to Chemical Engineering Principles *Sep. 2014 – Jan. 2015*

**Mentor/Supervisor of Undergraduate and Graduate Students**
CHALMERS UNIVERSITY OF TECHNOLOGY

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| • 3 Ph.D. students | Co-supervisor | *Sep. 2017 – Present* |
| • 1 Master's student | Co-supervisor | *Mar. 2018 – Nov. 2018* |
| • 1 visiting Ph.D. student | 8-month visiting Ph.D. student | *Nov. 2017 – Jun. 2018* |
| 5. Rasool Saghaleyni | Ph.D. student (co-supervisor) | *Apr. 2019 – Present* |
| 4. Angelo Limeta | Master's student (co-supervisor) | *Mar. 2018 – Nov. 2018* |
| 3. Johan Gustafsson | Ph.D. student (co-supervisor) | *Sep. 2017 – Present* |
| 2. Raphael Ferreira | Ph.D. student (co-supervisor) | *Sep. 2017 – Aug. 2019* |
| 1. Chinh Bkrong Nguyen | 8-month visiting Ph.D. student | *Nov. 2017 – Jun. 2018* |

PRINCETON UNIVERSITY

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| • 1 Undergraduate | 8-week summer research project | *Jul. 2015 – Aug. 2015* |
| • 2 M.D.-Ph.D. students | 8-week rotation | *May. 2015 – Jul. 2015* |
| • 1 Ph.D. student | 3-month rotation | *Mar. 2014 – May 2014* |
| • 11 Undergraduates | 1-year senior thesis and/or junior independent work | *Feb. 2013 – Dec. 2015* |
| 15. Joseph Graen | Senior Thesis, Chemical & Biological Engineering | *Sep. 2015 – Dec. 2015* |
| 14. Sarah Sacco | Senior Thesis, Chemical & Biological Engineering | *Sep. 2015 – Dec. 2015* |
| 13. Glen Gowers | 4th Year Research Project, Biochemistry (Oxford University, UK) | *Sep. 2015 – Dec. 2015* |
| 12. Viveka Mastandrea | Summer Research Project, Computer Science | *Jul. 2015 – Aug. 2015* |
| 11. Allison Murawski | M.D.-Ph.D. Rotation, Rutgers Robert Wood Johnson Medical School | *Jun. 2015 – Jul. 2015* |
| 10. Jacob Jaslove | M.D.-Ph.D. Rotation, Rutgers Robert Wood Johnson Medical School | *May 2015 – Jun. 2015* |
| 9. William Tso | Senior Thesis, Chemical & Biological Engineering | *Sep. 2014 – May 2015* |
| 8. Ismael Catovic | Senior Thesis, Chemical & Biological Engineering | *Sep. 2014 – May 2015* |
| 7. Jason Qin | Junior Independent Work, Chemical & Biological Engineering | *Sep. 2014 – May 2015* |
| 6. Richard Miller | Ph.D. Rotation Student, Molecular Biology | *Mar. 2014 – May 2014* |
| 5. Elliot Horlick | Junior Independent Work & Senior Thesis, Chem. & Biol. Engineering | *Sep. 2013 – May 2015* |
| 4. Edward Harvey | Senior Thesis, Chemical & Biological Engineering | *Sep. 2013 – May 2014* |
| 3. Anna Ren | Senior Thesis, Chemical & Biological Engineering | *Sep. 2013 – May 2014* |
| 2. Thomas Gilgenast | Senior Thesis, Chemical & Biological Engineering | *Sep. 2013 – May 2014* |
| 1. Shayan Rakhit | Junior Independent Work & Senior Thesis, Molecular Biology | *Feb. 2013 – May 2014* |

**Completed Pedagogical Training**
CHALMERS UNIVERSITY OF TECHNOLOGY
- University Teaching and Learning (CIU950) *Jan. 2019 – May 2019*
- Supervising Research Students (CLS905) *Sep. 2019 – Dec. 2019*

## POSITIONS OF TRUST

**Conference Organization Committee Chair** *Oct. 2019*

*2019 Swedish Bioinformatics Workshop, Gothenburg, Sweden*

- Leader of the organizing committee for the 2019 Swedish Bioinformatics Workshop
- Responsible for planning and executing program, acquiring and managing funds, and coordinating keynote speakers

**Conference Session Co-Chair** *Nov. 2018*

*2018 American Institute of Chemical Engineers Annual Meeting, Pittsburgh, PA, USA*

- Processed submitted abstracts and determined which qualify for a presentation.
- Facilitated presentations and proper function of session.

**Workshop Organizer and Leader** *Oct. 2018*

*Chalmers Sustainability Day 2018, Chalmers University of Technology, Sweden*

- Planned, organized, and led a 1 hr. interactive workshop on using machine learning with cancer transcriptomics
- Developed R-Shiny web application for use in the workshop (https://jonrob.shinyapps.io/tumorsecexplore/)

**Laboratory Safety Officer** *Apr. 2011 – Jan. 2016*

*Mark Brynildsen research group, Princeton University, USA*

- Prepared/organized documents on safe use of laboratory equipment and materials.
- Implemented and managed proper biosafety level (BSL) 2+ operating and waste disposal procedures.
- Coordinated report filing and communication with on-site visits of environmental health & safety (EHS) inspectors.

## PUBLICATIONS

18. Gustafsson J, **Robinson JL**, Inda-Díaz JS, Björnson E, Jörnsten R, Nielsen J. Dissecting Cell-to-Cell Variation in Single-Cell RNA-Seq Data. (Submitted).

17. **Robinson JL**, Kocabaş P, Wang H, Cholley PE, Cook D, Nilsson A, Anton M, Ferreira R, Domenzain I, Billa V, Limeta A, Hedin A, Gustafsson J, Kerkhoven EJ, Svensson T, Palsson BØ, Mardinoglu A, Hansson L, Uhlén M, Nielsen J. An Atlas of Human Metabolism. (Under Revision).

16. Uhlen M, Karlsson MJ, Hober A, Svensson AS, Scheffel J, Kotol D, Zhong W, Tebani A, Vunk H, Edfors F, Sjöstedt E, Mulder J, Mardinoglu A, Berling A, Ekblad S, Dannemeyer M, Kanje S, Rockberg J, Lundqvist M, Malm M, Volk AL, Nilsson P, Månberg A, Dodig-Crnkovic T, Pin E, Zwahlen M, Oksvold P, von Feilitzen K, Häussler RS, Hong MG, Lindskog C, Ponten F, Katona B, Vuu J, Lindström E, Nielsen J, **Robinson JL**, Ayoglu B, Mahdessian D, Sullivan D, Thul P, Danielsson F, Stadler C, Lundberg E, Voldborg B, Tegel H, Hober S, Forsström B, Schwenk JM, Fagerberg L, Sivertsson Å. The human secretome – the proteins actively secreted in human cells and tissues. *Sci Signal* **2019**, *12*, eaaz0274.

15. **Robinson JL**, Feizi A, Uhlén M, and Nielsen J. A systematic investigation of the malignant functions and diagnostic potential of the cancer secretome. *Cell Reports* **2019**, *26*, 2622–2635.

14. Azimi A, Caramuta S, Seashore-Ludlow B, Boström J, **Robinson JL**, Edfors F, Tuominen R, Kemper K, Krijgsman O, Peeper DS, Nielsen J, Hansson J, Brage SE, Altun M, Uhlén M, and Maddalo G. Targeting CDK2 overcomes melanoma resistance against BRAF and Hsp90 inhibitors. *Mol Syst Biol* **2018**, *14*, e7858.

13. **Robinson JL** and Nielsen J. Anticancer drug discovery through genome-scale metabolic modeling. *Curr Opin Syst Biol* **2017**, *4*, 1-8.

12. **Robinson JL**, Jaslove J, Murawski A, Fazen CH, and Brynildsen MP. An integrated network analysis reveals that nitric oxide reductase prevents metabolic cycling of nitric oxide by *Pseudomonas aeruginosa*. *Metab Eng* **2017**, *41*, 67-81.

11. **Robinson JL** and Nielsen J. Integrative analysis of human omics data using biomolecular networks. *Mol BioSyst* **2016**, *12*, 2953–2964. **Featured on journal cover*.

10. Gowers GOF, **Robinson JL**, and Brynildsen MP. Starved *Escherichia coli* preserve reducing power under nitric oxide stress. *Biochem Biophys Res Commun* **2016**, *476*, 29–34.

9. **Robinson JL** and Brynildsen MP. Construction and Experimental Validation of a Quantitative Kinetic Model of Nitric Oxide Stress in Enterohemorrhagic *Escherichia coli* O157:H7. *Bioengineering* **2016**, *3*, 9.

8. **Robinson JL** and Brynildsen MP. Discovery and dissection of metabolic oscillations in the microaerobic nitric oxide response network of *Escherichia coli*. *Proc Natl Acad Sci U S A* **2016**, *113*, E1757–E1766.

7. **Robinson JL** and Brynildsen MP (**2016**) Ensemble Modeling Enables Quantitative Exploration of Bacterial Nitric Oxide Stress Networks, in *Stress and Environmental Regulation of Gene Expression and Adaptation in Bacteria* (ed FJ de Bruijn), John Wiley & Sons, Inc., Hoboken, NJ, USA.

6. **Robinson JL** and Brynildsen MP. An ensemble-guided approach identifies ClpP as a major regulator of transcript levels in nitric oxide-stressed *Escherichia coli*. *Metab Eng* **2015**, *31*, 22–34.

5. **Robinson JL**, Miller RV, and Brynildsen MP. Model-Driven Identification of Dosing Regimens that Maximize the Antimicrobial Activity of Nitric Oxide. *Metab Eng Commun* **2014**, *1*, 12–18.

4. **Robinson JL**, Adolfsen KJ, and Brynildsen MP. Deciphering nitric oxide stress in bacteria with quantitative modeling. *Curr Opin Microbiol* **2014**, *19*, 16–24.

3. **Robinson JL** and Brynildsen MP. A Kinetic Platform to Determine the Fate of Nitric Oxide in *Escherichia coli*. *PLoS Comput Biol* **2013**, *9*, e1003049.

2. Mayeno AN, **Robinson JL**, and Reisfeld B. Rapid Estimation of Activation Enthalpies for Cytochrome-P450-Mediated Hydroxylations. *J Comput Chem* **2011**, *32*, 639–657.

1. Mayeno AN, **Robinson JL**, Yang RSH, and Reisfeld B. Predicting Activation Enthalpies of Cytochrome-P450-Mediated Hydrogen Abstractions. 2. Comparison of Semiempirical PM3, SAM1, and AM1 with a Density Functional Theory Method. *J Chem Inf Model* **2009**, *49*, 1692–1703.

## PRESENTATIONS

### INVITED TALKS

4. **Robinson JL** and Nielsen J. An Atlas of Human Metabolism. SiOSB: Siriraj Omics & Systems Biology in Biomedicine 2020 conference (Jan. **2020**). Bangkok, Thailand.

3. **Robinson JL** and Nielsen J. Using RAVEN for reconstruction and analysis of genome-scale metabolic models. Reconstruction Workshop associated with the Centre for Digital Life Norway (Apr. **2019**). Finse, Norway.

2. **Robinson JL** and Nielsen J. Integrative systems biology through genome-scale metabolic models. Swedish Bioinformatics Workshop (Oct. **2018**). Örebro, Sweden.

1. **Robinson JL** and Nielsen J. Extracting cancer biomarkers from human -omics data. Chalmers Initiative Seminar: Digitalisation – Opportunities and Challenges (Mar. **2017**). Gothenburg, Sweden.

### ORAL PRESENTATIONS

10. **Robinson JL** and Nielsen J. Integrative omics analysis of cancer protein secretion. 2017 American Institute of Chemical Engineers Annual Meeting (Nov. **2017**). Minneapolis, MN, USA.

9. **Robinson JL** and Brynildsen MP. Discovery and Dissection of Metabolic Oscillations in the Nitric Oxide Response of *Escherichia coli* under Microaerobiosis. 2015 American Institute of Chemical Engineers Annual Meeting (Nov. **2015**). Salt Lake City, UT, USA.

8. **Robinson JL** and Brynildsen MP. Exploration of Bacterial Nitric Oxide Stress Responses as a Source of Antivirulence Targets. Emerging Alumni Scholars Award Lecture (May **2015**). Princeton, NJ, USA.

7. **Robinson JL** and Brynildsen MP. Emergent Properties of the *E. coli* Nitric Oxide Response Network. 2014 American Institute of Chemical Engineers Annual Meeting (Nov. **2014**). Atlanta, GA, USA.

6. **Robinson JL** and Brynildsen MP. Model-Driven Identification of Antivirulence Targets in the Nitric Oxide Response Network of *E. coli*. Princeton Bioengineering Colloquium (Mar. **2014**). Princeton, NJ, USA.

5. **Robinson JL** and Brynildsen MP. Model-Driven Identification of Antivirulence Targets in the Nitric Oxide Response Network of Bacteria. Princeton Graduate Student Symposium (Oct. **2013**). Princeton, NJ, USA.

4. **Robinson JL** and Brynildsen MP. Model-Driven Identification of Clp Protease Activity as an Emergent Property of the Nitric Oxide Response Network in *Escherichia coli*. Molecular Genetics of Bacteria and Phages Meeting (Aug. **2013**). Madison, WI, USA.

3. **Robinson JL** and Brynildsen MP. A Kinetic Platform to Determine the Fate of Nitric Oxide in *Escherichia coli*. Princeton Prokaryotes Meeting (May **2013**). Princeton, NJ, USA.

2. **Robinson JL** and Brynildsen MP. A Kinetic Platform to Determine the Fate of Nitric Oxide in Bacteria. American Institute of Chemical Engineers Annual Meeting (Oct. **2012**). Pittsburgh, PA, USA.

1. **Robinson JL** and Brynildsen MP. Investigation of *E. coli* Biofilm Production using Elementary Mode Analysis. Princeton Biofilm Consortium (Oct. **2011**). Princeton, NJ, USA.

### POSTER PRESENTATIONS

6. **Robinson JL**, Ferreira R, Gatto F, and Nielsen J. Exploring the metabolic shift associated with cancer hypermutation. 2018 American Institute of Chemical Engineers Annual Meeting (Nov. **2018**). Pittsburgh, PA, USA.

5. **Robinson JL** and Brynildsen MP. Identification of Antivirulence Targets in Bacterial Nitric Oxide Defense Networks. Princeton

Bioengineering Day (Oct. **2015**). Princeton, NJ, USA.

4. **Robinson JL** and Brynildsen MP. A Kinetic Platform to Determine the Fate of Nitric Oxide in *E. coli*. Princeton Graduate Student Symposium (Oct. **2012**). Princeton, NJ, USA.

3. Adolfsen KJ, **Robinson JL**, Pan J, Link AJ, and Brynildsen MP. Novel Strategies to Prevent Biofouling: Connecting Physiology to Biofilm Material Properties. Princeton Center for Complex Materials NSF Site Visit (Sep. **2012**). Princeton, NJ, USA.

2. **Robinson JL**, Reisfeld B, and Mayeno AN. Predicting Activation Enthalpies of Cytochrome-P450-Mediated Hydrogen Abstractions: Comparison of Semi-Empirical PM3, SAM1, and AM1 with a Density Functional Theory Method. 49th Annual Meeting of the Society of Toxicology (Mar. **2010**). Salt Lake City, UT, USA.

1. **Robinson JL**, Reisfeld B, and Mayeno AN. An Updated Methodology to Predict Rates of Cytochrome P450 Mediated Hydroxylation of Aliphatic Substrates (Apr. **2008**). Colorado State University Celebrate Undergraduate Research and Creativity Showcase. Fort Collins, CO, USA. **Award*: Honors in the College of Engineering