

Christopher Johnstone

PhD candidate, Chemical Engineering

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Education

- Sep 2019 – Ongoing | **Massachusetts Institute of Technology, Cambridge, MA**
PhD in Chemical Engineering, minor in biological systems modeling.
- Advisor: Kate E. Galloway
- Aug 2015 – Jun 2019 | **California Institute of Technology, Pasadena, CA**
BS in Chemical Engineering, Minor in Computer Science.
- Advisor: David A. Tirrell
 - Senior thesis: Control of aggregated bacterial communities through engineered surface displayed proteins.

Experience

- Dec 2019 - Ongoing | **Galloway Lab, MIT – Cambridge, MA**
PhD candidate
- Currently investigating the impact of transcription-induced supercoiling on gene regulation.
- Dec 2016 – Jun 2019 | **Tirrell Lab, Caltech – Pasadena, MA**
Research student, Robb and Eunice Rutledge SURF fellow (summer 2017)
- Demonstrated a synthetic aggregation circuit and quorum sensing circuit to manipulate and sense aggregation of communities of *E. coli* cells.
 - Rationally designed and characterized a protein for photocontrollable bacterial aggregation.
- Jun 2018 – Aug 2018 | **Provivi – Santa Monica, CA**
Metabolic engineering intern
- Identified and overexpressed bottleneck pathway genes, creating a yeast strain producing 30% more lipid dry mass.
- Jun 2016 – Sep 2016 | **Pure Storage – Mountain View, CA**
Software engineering intern
- Implemented a customer-facing feature to accurately account utilized storage space across clusters.

Publications

- 2022 | 1. **Johnstone, C. P.** & Galloway, K. E. Supercoiling-Mediated Feedback Rapidly Couples and Tunes Transcription. *Cell Reports* **41** (Oct. 18, 2022).
- 2021 | 2. **Johnstone, C. P.** & Galloway, K. E. Engineering Cellular Symphonies out of Transcriptional Noise. *Nature Reviews Molecular Cell Biology* (Mar. 15, 2021).
3. Kozlowski, M. T., Silverman, B. R., **Johnstone, C. P.** & Tirrell, D. A. Genetically Programmable Microbial Assembly. *ACS Synthetic Biology* **10**, 1351–1359 (June 18, 2021).
- 2020 | 4. **Johnstone, C. P.**, Wang, N. B., Sevier, S. A. & Galloway, K. E. Understanding and Engineering Chromatin as a Dynamical System across Length and Timescales. *Cell Systems* **11**, 424–448 (Nov. 18, 2020).

Talks

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| 2022 | <ul style="list-style-type: none">• 2022 AIChE Annual Meeting. <i>Modeling Supercoiling-Dependent Feedback As a Transcriptional Coordinator to Understand and Engineer Biological Circuits</i>. Phoenix, AZ.• Boston Mammalian Synthetic Biology. <i>Supercoiling-mediated feedback rapidly couples and tunes transcription</i>. Boston, MA. |
| 2018 | <ul style="list-style-type: none">• 255th ACS National Meeting. Poster. <i>Strategies for controlled bacterial assembly resulting in activation of a quorum-sensing circuit</i>. (with M. T. Kozlowski). New Orleans, LA. |

Honors

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| Jun 2019 | Frederic W. Hinrichs Jr. Memorial Award Recipient
Award given to the two seniors who have made the greatest contribution to the student body and whose qualities of character, leadership, and responsibility have been outstanding. |
| May 2018 | Donald S. Clark Award Recipient
Award given to two engineering juniors who show academic excellence, leadership, and dedication to the Caltech community. |
| Mar 2018 | Elected to Tau Beta Pi |

Teaching Experience

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| 2021 | Chemical Engineering Department, MIT
<i>TA for Graduate Thermodynamics</i> <ul style="list-style-type: none">• Developed homeworks, wrote course exams, and prepared review sessions and lecture notes. |
| 2017-2019 | Caltech
<i>TA for Separation Processes, Intro to Chemical Engineering Computation, Computer Graphics, Intro to Programming Methods</i> <ul style="list-style-type: none">• Developed novel examples, practice tests, and review sessions for weekly recitation sessions. |

Leadership

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| Mar 2020 –
Mar 2022 | Sidney Pacific Graduate Residence, MIT
<i>VP of Residential Life</i> <ul style="list-style-type: none">• Secured funding for the residence, and led a group of officers in development of safe social events to build community amid pandemic restrictions. |
| Sep 2020 –
Sep 2021 | GSCX, MIT <ul style="list-style-type: none">• Coordinated and organized virtual social events for the Chemical Engineering department throughout Covid. |
| Apr 2016 –
Apr 2019 | Board of Control, Caltech
<i>Board member, Secretary (until Mar 2018), Chair</i> <ul style="list-style-type: none">• Led investigations, coordinated with administrators and professors, and organized hearings for academic honor code violations. |