

David Dooley

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EDUCATION

University of Tennessee 2019–Present

Knoxville, TN

Degree: Ph.D. Chemical Engineering

GPA: 3.94

University of Tennessee 2019–2022

Knoxville, TN

Degree: M.S. Chemical Engineering

GPA: 3.94

Tennessee Technological University 2015–2019

Cookeville, TN

Degree: B.S. Chemical Engineering (Biomolecular conc.)

GPA: 3.87

EXPERIENCE

Graduate Research Assistant

University of Tennessee

Aug. 2018–Present

- Developing safe and effective CRISPR-Cas antimicrobials against virulent pathogens.
- Engineering stable and specific microbial production platforms for CRISPR-carrying phage-like particles.
- Understanding transcriptomic and proteomic response of target pathogens to treatment with CRISPR-Cas antimicrobials.

Teaching Assistant

University of Tennessee

Aug. 2020–Dec. 2023

- Served as TA for the following courses:
 - Fall 2020: CBE 350 - Chemical and Bioengineering Reactor Fundamentals
 - Spring 2021: CBE 340 - Mass Transfer and Separation Processes
 - Spring 2022: CBE 551 - Advanced Chemical and Biomolecular Engineering Kinetics and Reactor Design
 - Fall 2023: CBE 350 - Chemical and Bioengineering Reactor Fundamentals
- Graded homeworks and exams and proctored tests.
- Held office hours to provide instruction and feedback on assignments and grading.

REU Research Assistant

National Science Foundation

May 2018–Aug. 2018

- Investigated effect of feedstock pretreatment on kinetics of cellulosic pyrolysis.
- Designed, performed, and presented various experiments involving thermogravimetric, rheological, and X-ray diffraction-based analyses.

PUBLICATIONS

- Mendoza, B.** , Fry, T.** , Dooley, D.** , Herman, J., & Trinh, C. T. (2022). CASPER: An Integrated Software Platform for Rapid Development of CRISPR Tools. *The CRISPR Journal*, 5(4), 609-617. ** equal contribution
- Walker, C., Ryu, S., Garcia, S., Dooley, D., Mendoza, B., & Trinh, C. T. (2022). Gene Coexpression Connectivity Predicts Gene Targets Underlying High Ionic-Liquid Tolerance in *Yarrowia lipolytica*. *Msystems*, 7(4), e00348-22.
- Dooley, D., Trinh, C.T. Simultaneous Co-Targeting of Essential and Defensive Gene Targets in *Staphylococcus aureus* Increases Potency and Mitigates Resistance to CRISPR Antimicrobials. (*in preparation*)
- Dooley, D., Trinh, C.T. Improving the Specificity and Host Range of a Phage-Based Delivery System in *Staphylococcus aureus*. (*in preparation*)
- Dooley, D., Giannone, R., Trinh, C.T. Multi-OMICS Analysis of CRISPR Antimicrobial Treatment Reveals Resistance Mechanisms and Genetic Targets in *Staphylococcus aureus*. (*in preparation*)
- Dooley, D., Edwards, J., Ryu, S., Dien, B.S., Trinh, C.T. Characterizing Proteome Reallocation of an Undomesticated Robust *Bacillus coagulans* Growing on Fermentable C5 and C6 Sugars. (*in preparation*)

PRESENTATIONS

- Dooley, D., Trinh, C. T. "Casper: An Integrated Software Platform for CRISPR Gene Editing of Non-Model Organisms and Microbiomes." 2023 AIChE Annual Meeting. Orlando, FL. 11/8/23.
- Dooley, D., Ryu, S., Edwards, J., Ha, K., Giannone, R., Dien, B., Trinh, C. T. "Harnessing Robustness of Thermophilic Bacillus Coagulans for Conversion of Switchgrass Hydrolysates to Designer Bioesters at Elevated Temperatures." 2023 AIChE Annual Meeting. Orlando, FL. 11/6/23. (Poster)

AWARDS AND HONORS

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| • Tickle College of Engineering One-Time Fellowship Award | July 2023 |
| • Outstanding Promise CBE Graduate Student Award | April 2023 |
| • SARIF Summer Research Graduate Assistantship | June 2021 |
| • Tennessee Tech Eminence Award for Outstanding Innovation | May 2019 |
| • Dr. John C. McGee and Family Scholarship | May 2016–May 2019 |
| • University Academic Scholarship from Tennessee Tech University | Aug. 2015–May 2019 |
| • Dean's List at Tennessee Tech University | May 2016–May 2019 |

OUTREACH ACTIVITIES

- Mentor for UTK CBE Undergraduate Researchers 2021–Present
 - Coordinate research efforts of undergraduate researchers in the Trinh Lab.
 - Train students in critical thinking and formulation of creative research projects.
 - Provide technical advice and troubleshooting for undergraduate researchers' projects.
- Mentor for Student Mentoring and Research Training program (SMaRT) 2022
 - Provided mentorship and guidance to undergraduate SMaRT program participants on graduate-level studies.
 - Instructed participants on ethical research practices involving collection, storage, and communication of scientific data.
 - Taught participants molecular cloning techniques and assisted them in assembling a fluorescence-producing plasmid.
- Mentor for High School Introduction to Engineering Systems for Twelfth Graders (HITES¹²) 2020–2021
 - Gave oral presentations to high school students on Trinh Lab research.
 - Conceived and led educational workshops to introduce participants to Trinh Lab research concepts and methodologies.

LAB CITIZENSHIP

- Purchasing Officer 2020–Present
 - Serve as point of contact for all incoming and outgoing goods in the Trinh Lab.
 - Monitor and organize Trinh Lab inventory, purchasing replacements when necessary.
- Instrument Manager 2019–Present
 - Manage Opentrons Flex and OT-2 robots, Guava flow cytometer, MinION sequencer, Nanodrop, and gel imager.
 - Perform routine maintenance, calibration, and repair for assigned instruments.
 - Develop standard operating procedures and protocols for assigned instruments.