

Matthew D. Carpenter

Matthew.D.Carpenter@rice.edu

Curriculum Vitae

Education

Rice University <i>Ph.D., Systems, Synthetic, and Physical Biology</i>	Houston, TX	Aug 2019 – Present
The University of Texas at Dallas <i>B.S., Molecular Biology</i> <ul style="list-style-type: none">• Spring 2018 Green Fellow• Fall 2017 Bill Archer Fellow	Richardson, TX	Aug 2015 – May 2019

Research Experience

Rice University <i>Graduate Student Principal Investigator: Caroline Ajo-Franklin</i> <ul style="list-style-type: none">• Investigate extracellular electron transfer in <i>Shewanella oneidensis</i> and modified <i>Escherichia coli</i> to develop engineered bacteria and bioelectrochemical devices for biosensing applications		Jan 2020 – Present
The University of Texas Southwestern Medical Center <i>Green Fellow Department of Cell Biology Principal Investigator: Andreas Doncic</i> <ul style="list-style-type: none">• Interrogated novel stress response-associated physiological phenomena in <i>Saccharomyces cerevisiae</i> by investigating the interplay of complex signaling pathways through live cell imaging and single cell data analysis• Managed projects, developed new yeast strains for investigation using molecular cloning techniques, designed and executed experiments, generated data using multi-color live cell fluorescence imaging, analyzed large volumes of data, and presented findings• Developed, enhanced, and utilized MATLAB code to identify and quantify specific signals from fluorescence microscopy image data and to count yeast colonies from images of plates		Jan 2018 – June 2018
John Innes Centre <i>Visiting Worker Cell and Developmental Biology Department Principal Investigator: Giles Oldroyd</i> <ul style="list-style-type: none">• Investigated the role of lateral organ boundary gene analogs in nodule organogenesis in the model legume <i>Medicago truncatula</i>• Assisted PI and his postdoctoral researcher, Dr. Katharina Schiessl, with laboratory experiments within a larger research effort to sustainably increase crop yields in Sub-Saharan Africa by engineering cereal crops to engage in symbiosis with nitrogen-fixing bacteria• Helped lead efforts to introduce CRISPR-Cas9 gene editing as a viable technique for generating useful <i>Medicago truncatula</i> strains within the laboratory's existing framework		May 2017 – Aug 2017
The University of Texas at Dallas <i>Undergraduate Research Assistant Advanced Cellular Engineering Laboratory, Center for Engineering Innovation Principal Investigators: Eric Kildebeck and Walter Voit</i> <ul style="list-style-type: none">• Investigated strategies for therapeutic gene editing and cellular engineering in allergy and autoimmune disease• Planned projects, reviewed literature, instructed students, and designed and conducted laboratory experiments• Identified potential flaws in project design and developed mitigation strategies• Assisted PI's in review of current literature, design of experiments, and writing of proposals• Designed an independent research project investigating the use of bacterial protease chimeras to mitigate immune responses against engineered cells• Presented a poster on a self-designed, funded research project, earning the first-place award at UT Dallas's Undergraduate Research Scholar Award poster contest		Sept 2015 – May 2017

Professional Experience

Systems, Synthetic, and Physical Biology Graduate Student Association

May 2020 – May 2021

Recruitment Chair

- Assisted SSPB Program administrators with planning and organizing recruitment activities by arranging and hosting virtual and in-person social events for current and prospective students
- Advocated for the interests of SSPB graduate students to SSPB Program administrators and facilitated communication between administrators and students as a member of the SSPB GSA officer board

U.S. House of Representatives Committee on Science, Space, and Technology

Sep 2017 – Dec 2017

Intern

- Conducted thorough background research on science and technology policy topics across the committee's jurisdiction, prepared memos on briefings and hearings, and prepared materials for hearings

AMP, The University of Texas at Dallas Student Opinion Publication

Managing Editor

Oct 2016 – May 2017

- Curated and edited all content for 28-36-page monthly magazine
- Managed, trained, and recruited teams of volunteer writers to diversify content and increase student interest

Satire Editor

Apr 2016 – Oct 2016

- Overhauled and expanded the satire section by revising content and directing a novel marketing strategy

Honors & Awards

Eugene McDermott Scholar

Apr 2015 – May 2019

Full undergraduate scholarship that supports distinguished students in experiential learning, leadership, and service

Undergraduate Research Scholar Award

Nov 2016

Research project was awarded financial support from UT Dallas via a competitive proposal process

Publications

Schiessl, K., Lilley, J.L.S., Lee, T., Tamvakis, I., Kohlen, W., Bailey, P.C., Thomas, A., Luptak, J., Ramakrishnan, K., **Carpenter, M.**, Mysore, K.S., Wen, J., Ahnert, S., Grieneisen, V.A., Oldroyd, G.E.D. (2019). NODULE INCEPTION Recruits the Lateral Root Development Program for Symbiotic Nodule Organogenesis in *Medicago truncatula*. *Current Biology*, 29:3657-3668.

Poster Presentations

Carpenter, M., Arguello-Miranda, O., Doncic, A. (2018, June). Probing ER-Related Stress with Lipid Markers. Poster session at q-bio 2018, Houston, TX

Carpenter, M., Kildebeck, E. (2017, April). Design and Construction of Protein Chimeras for Selective Depletion of IgE and IgG Antibodies. Undergraduate Research Scholar Award poster contest, The University of Texas at Dallas