

Michael Burke

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EDUCATION

Yale University, New Haven, Connecticut, USA

PhD Student in Chemistry, Biophysical Subdivision

Sep 2020 – Present

- Advisors: Victor Batista and Caitlin Davis

The University of Chicago, Chicago, Illinois, USA

Bachelors of Science in Chemistry with Honors

Sep 2013 – Jun 2017

- Honors Thesis: “Antibody-Functionalized Silicon Nanowires as a T Cell Activation Suppressant”
- Advisor: Dr. Bozhi Tian

RESEARCH EXPERIENCE

Yale University, New Haven, CT

Sep 2020 – Current

Graduate Research Assistant, Batista and Davis Labs

- Investigates differences in protein folding and function under different *in vivo* conditions

SQZ Biotechnologies, Boston, MA

Sep 2018 – Jun 2020

Research Associate, Tolerance Team

- Designed and executed experimental plans to investigate *in vitro* the mechanism of antigen presentation by Tolerizing Antigen Carriers (TACs) generated by using SQZ’s Cellsqueeze platform to load antigen into Red Blood Cells.
- Investigated antigen-specific tolerance in different *in vivo* models (EAE, OTI/OTII, Immunization/Tolerization, NOD) contribute to the pre-clinical data package for Type 1 diabetes

The Tian Research Group, The University of Chicago, IL

Nov 2015 – Jun 2018

Undergraduate Researcher and Research Associate

- Designed and characterized silicon nanomaterials for biological observation and modulation.

The Cronin Group, The University of Glasgow, Scotland

Jun 2015 – Aug 2015

Undergraduate Summer Research Student

- Advisor: Dr. Haralampos Miras
- Ran independent spectroscopic experiments to determine the kinetics and mechanism of a self-assembling molybdenum polyoxometalate.

PUBLICATIONS

Phillips, A.W., Parameswaran, R., Lichter, E., Jeong, J., Meng, L., **Burke, M.**, Koehler, K., Lee, Y.V, Tian, B., ”Gold-Decorated Silicon Nanowire Photocatalysts for Intracellular Production of Hydrogen Peroxide”. *ACS Appl. Mater. Interfaces*. **2021**, 13, 13, 15490–15500

Parameswaran, R., Koehler, K., Rotenberg, M., **Burke, M.**, Kim, J., Jeong, K., Hissa, B., Paul, M., Moreno, K., Sarma, N., Hayes, T., Sudzilovsky, E., Park, H., and Tian, B. “Optical stimulation of cardiac cells with a polymer-supported silicon nanowire matrix”. *PNAS* **2018**, 116 (2) 413-421.

Parameswaran, R., Carvalho-de-Souza, J.L., Jiang, Y., **Burke, M.**, Zimmerman J., Koehler, K., Philips, A., Jaesok, Y., Adams, E., Bezanilla, F., Tian, B. “Photoelectrochemical modulation of neuronal activity with free-standing coaxial silicon nanowires”. *Nature Nanotechnology* **2018**, 13, 260–266

Zimmerman, J.F., Parameswaran, R., Murray, G., Wang, Y., **Burke, M.**, Tian, B., ”Cellular uptake and dynamics of unlabeled freestanding silicon nanowires”. *Science Advances*. **2016**, 2.12 e1601039

POSTER PRESENTATIONS

Burke, M., Parameswaran, R, and Tian, B. “Antibody-Functionalized Silicon Nanowires for the Depolarization of T Cells”, *Materials Research Society Fall 2016 Conference*. Boston, MA, USA, Nov 2016.

Burke, M., Miras, H., and Cronin, T. “Kinetics of a Self Assembly Governed Polyoxometalate”, *University of Chicago Undergraduate Research Symposium*. Chicago, IL, USA, Sep 2015.

TEACHING EXPERIENCE

Teaching Fellow, General Chemistry II, Yale University

Spring 2021

Teaching Fellow, General Chemistry I, Yale University

Fall 2020

General and Organic Chemistry Tutor, The University of Chicago

Sep 2016 – Jun 2017

- Hired by the University of Chicago based on recommendation and previous performance in general and organic chemistry.

SKILLS

In vitro Techniques

- Cell Culture, Protein Expression and purification, ELISA, ELISpot, qPCR, Flow Cytometry, Confocal Microscopy, and Immunological Staining.

In vivo Techniques

- Animal handling, Injections (Intravenous, retro-orbital, and subcutaneous), EAE scoring, glucose measurements, organ harvest (spleen, lymph nodes)

Computer Programming

- Python, R, Mathematica, MatLab, L^AT_EX, and Gaussian 09