Maya Bolger-Chen

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Education

University of Virginia, Charlottesville VA — July 2025-Present
- Biomedical Sciences Ph.D. student

Syracuse University, Syracuse NY — 2018-2022
- Bachelor of Science in Biological Sciences, Minor in Forensic Science

Dartmouth College, Hanover NH — 2017-2018
- Supplemental Course

Research Experience

Graduate Student Researcher, Experimental Pathology — February 2026-Present
University of Virginia, Charlottesville VA
- Project title: Investigating the use of target ultrasound for AAV delivery to skeletal muscle

Research Technician II, Center for Engineering in Medicine and Surgery — June 2022-2025
Massachusetts General Hospital, Harvard Medical School
- Project title: *Development of Novel Preservation and Ischemia Tolerance Protocol for Hearts*
  - Optimized an ex vivo heart perfusion protocol for cryopreservation.
  - Procured 100+ rodent hearts for machine perfusion experiments.
  - Scaled up ex vivo heart perfusion facility for higher throughput experiments.
  - Performed Luminex assay to quantify injury and inflammatory markers using perfusate samples.
  - Stained histological slides for elastin and TUNEL to examine edema and apoptosis post perfusion.
  - Led the collection and analysis of extensive data sets generated from heart perfusion experiments, employing statistical tools and data visualization techniques to extract meaningful insights.
- Project title(s): *Promising Biochemical and Hemodynamic Trends in Ex-vivo Heart Perfusion using a Physiologic Loading Configuration* and *Assessment of Extended Criteria Donor Hearts with Resonance Raman Spectroscopy during Normothermic Machine Perfusion*
  - Pioneered the development of a large animal and human heart perfusion protocol, catering to the unique anatomical and physiological characteristics of large mammals, resulting in a valuable resource for cardiovascular research.
  - Collaborated closely with interdisciplinary teams of researchers and scientists to execute experiments, fostered a culture of teamwork, and ensured project milestones were met.
- Project title: *Zebrafish as a Model for Cryopreservation of Organs and Tissues*
  - Dosed zebrafish larvae with mitochondria targeting compounds to identify viable biostasis drugs for static cold storage.
  - Validated compounds of interest using ATP and Caspase assays.

Research Assistant, Department of Biology, Syracuse University — March 2020-May 2022
- Project title: *Evaluating the Effects of Blocking Maternal Progesterone on Primordial Follicle Formation*
  - Evaluated the effects of steroid hormones such as progesterone and estrogen on cyst breakdown and primordial follicle formation in the female mouse model by manual quantification.
  - Implemented dissection techniques for harvesting ovaries in neonate mice.
  - Stained ovaries with antibodies to visualize using confocal microscopy.

Student Supervisor**,** COVID Pooling Lab, Syracuse University August 2021-May 2022

- Implemented pipetting techniques to pool and organize large quantities of COVID-19 tests for Syracuse University students.

Research Assistant, Department of Biology, Dartmouth College Summer 2019

- Developed a protocol that identified the neonatal line in teeth samples using embedding and slicing methods.
    - Strategically prepared microscope slides to be put under a polarizing light microscope to identify sample exposure to heavy metals.
    - Implemented basic lab safety and protocols and assisted in data collection and management.

Publications

- **Maya Bolger-Chen***, Manuela Lopera Higuita*, Casie A. Pendexter, Stephanie A. Cronin, S. Alireza Rabi, Asishana A. Osho, Shannon N. Tessier. *Coauthors "Cardiac Ex Vivo Machine Perfusion: The Importance of Perfusion Parameter Customization During Langendorff". Scientific Reports. 2025
- Casie A. Pendexter, **Maya Bolger-Chen**, Manuela Lopera Higuita, Stephanie A. Cronin, S. Alireza Rabi, Asishana A. Osho, Shannon N. Tessier. "Modified Langendorff Perfusion for Extended Perfusion Times of Rodent Cardiac Grafts" Journal of Visualized Experiments (JoVE). 2024
- George Olverson IV, Manuela Lopera Higuita, **Maya Bolger-Chen,** Emmanuella O. Ajenu, Selena Li, Hussein Kharroub, Bassel, Chukwudi Chijioke, Nathan Minie, Joseph Catricala, Allison Pitti, William Michaud, Doug Vincent, David D'Alessandro, S. Alireza Rabi, Shannon N. Tessier, Asishana A. Osho. "Cardiac Loading via passive left atrial pressurization and passive afterload as a method for graft assessment". Journal of Visualized Experiments (JoVE). 2024
- A Trimigno, J Zhao, WA Michaud, DC Paneitz, C Chukwudi, KB Sheehan, DA D'Alessandro, G Lewis, N Minie, J Catricala, D Vincent, M Lopera Higuita, **Maya Bolger-Chen**, SN Tessier, EM O'Day, AA Osho, SA Rabi. (2023). "Metabolic Choreography During DCD Heart Perfusion." Transplantation Direct. 2024
- Emmanuella O. Ajenu*, Manuela Lopera Higuita*, **Maya Bolger-Chen**, Khanh T. Nguyen, George Olverson IV, Gurjit Singh, Tyler M. Pugeda, Doug Vincent, Padraic Romfh, Seyed Alireza Rabi, Asishana A. Osho, Shannon N. Tessier. *Coauthors "Advancing Assessment Methods for Human Cardiac Grafts During Normothermic Machine Perfusion." Transplantation. 2025
- Manuela Lopera Higuita, Emmanuella O. Ajenu, **Maya Bolger-Chen**, George Olverson IV, C Chukwudi Selena Li, William Michaud, Doug Vincent, N Minie, J Catricala, Allison Pitti, DA D'Alessandro, Asishana A. Osho, Shannon N. Tessier, Seyed Alireza Rabi." " Alternative preservation strategies of DCD hearts: Effect of cold ischemia time before normothermic machine perfusion". Journal of the American Heart Association. 2025
- Julianna E. Buchwald, Hassan H. Fakih, **Maya Bolger-Chen**, Manuela Lopera Higuita, Amir Sanatkar, Sara De Taeye, Richard N. Pierson, Thoralf M. Sundt III, Asishana A. Osho, Shannon N. Tessier, Anastasia Khvorova, S. Alireza Rabi. "Lipophilic siRNA Enables Functional Delivery of Ex Vivo Perfused Rat, Pig, and Human Hearts During Transplantation". [Submitted]

Abstracts and Presentations

- Manuela Lopera Higuita, **Maya Bolger-Chen**, Selena S. Li, Emmanuella O. Ajenu, George Olverson IV, Nathan Minie, Joseph Catricala, Allison Pitti, William Michaud, Kenneth Shann, Doug Vincent, David D'Alessandro, Shannon N. Tessier, Asishana A. Osho, S. Alireza Rabi. "Promising Biochemical and Hemodynamic Trends in Ex-vivo Heart Perfusion using a

Physiologic Loading Configuration." April 9-12, 2024. International Society for Heart and Lung Transplantation.

- **Maya Bolger-Chen**, Manuela Lopera Higuita, Casie A. Pendexter, Mohammadreza Mojoudi, Asishana A. Osho, S. Alireza Rabi, Shannon N. Tessier. "The Effects of Different Perfusion Parameters on Cardiac Graft Behavior during Langendorff". April 9-12, 2024. International Society for Heart and Lung Transplantation. [Poster]
- Brian Ayers, George Olverson IV, Chijioke Chukwudi, Thomas Kite, Manuela Lopera Higuita, Emmanuella Ajenu, **Maya Bolger-Chen**, Matthew Beck, Joe Catricala, Aaron Aguirre, Thor Sundt, Asishana Osho, Shannon Tessier, S Alireza Rabi, David D'Alessandro "Video kinematics of an unloaded, ex-vivo beating heart can predict future loaded heart function." American Association Thoracic Surgery.
- Emmanuella O. Ajenu, Manuela Lopera Higuita, **Maya Bolger-Chen**, Khanh T. Nguyen, George Olverson IV, Gurjit Singh, Doug Vincent, Padraic Romfh, Seyed Alireza Rabi, Asishana A. Osho, Shannon N. Tessier. "Assessment of Extended Criteria Donor Hearts with Resonance Raman Spectroscopy during Normothermic Machine Perfusion." April 9-12, 2024. International Society for Heart and Lung Transplantation.
- Julianna E. Buchwald, Hassan H. Fakih, **Maya Bolger-Chen**, Manuela Lopera Higuita, Amir Sanatkar, Sara De Taeye, Richard N. Pierson, Thoralf M. Sundt III, Asishana A. Osho, Shannon N. Tessier, Anastasia Khvorova, S. Alireza Rabi. "Delivering siRNA-based Therapies During Ex-Vivo Machine Perfusion to Optimize Organs for Transplantation." American Transplant Congress (ATC) Annual Meeting.
- Julianna E. Buchwald, Hassan H. Fakih, **Maya Bolger-Chen**, Manuela Lopera Higuita, Richard N. Pierson, Asishana A. Osho, Shannon N. Tessier, Anastasia Khvorova, S. Alireza Rabi. "Optimizing Hearts for Transplantation Using siRNA-based Therapies During Ex-Vivo Machine Perfusion" The International Society for Heart and Lung Transplantation.
- Tyler M. Pugeda, **Maya Bolger-Chen**, Manuela Lopera-Higuita, Shannon N. Tessier. "Translating Cryoprotectant Agent (CPA) Screening from Zebrafish to Mammals: A Two-Stage Approach to Advance Cardiac Cryopreservation." July 25-27, 2023. Society for Cryobiology.
- **Maya Bolger-Chen,** Lopera Higuita, M., Da Silveira Cavalcante, L., Robles, A., González-Rosa, J., Tessier, "Partial Freezing of Hearts for Transplantation." April 12, 2023. ATP-BIO Year 2 NSF Site Visit. [Poster].
- **Maya Bolger-Chen**, Lopera Higuita, M., Da Silveira Cavalcante, L., Robles, A., González-Rosa, J., Langenau, D., Toner, M., Tessier, "Partial Freezing of Hearts for Transplantation." October 25, 2022. ATP-BIO Year 2 NSF Site Visit. [Poster].
- **Maya Bolger-Chen,** Getman, S., Loveland, K., Pepling, M., "Evaluating the Effects of Blocking Maternal Progesterone on Primordial Follicle Formation." August 11, 2021. SOURCE Summer Research Symposium, Hybrid [Poster].

Skills

Technical Skills: *Microsoft Office 365, Graph Pad Prism, Image J, Zen Blue, Zen Black, Institutional Animal Care and Use Committee Protocol Writing*
Laboratory Skills: *Pipetting, Buffer Preparation, Cell Culture Maintenance, Cryopreservation Techniques and Thawing, Fluorescent Microscopy, Confocal Microscopy, Ex Vivo Machine Perfusion, Histological Staining, Sterile Techniques in Stem Cell Culture (Mesenchymal Stem Cells), Luminex*
Animal Skills: *Euthanasia (carbon dioxide), Weighing Animals, Breeding (Zebrafish, Mice), Organ Procurement (Heart), Aseptic Surgery Techniques*

Leadership and Volunteering

Peer-Led Team Leader**,** Syracuse University Fall 2020

– Led a group of introductory biology students throughout the semester in a weekly class discussion.
– Met once a week with other peer leaders to discuss techniques and strategies to support students.

Awards and Honors

Robert A. Clark Biotechnology Student Research Award**,** Syracuse University Summer 2021
SOURCE Grant, Syracuse University Spring 2022
Dean's List, Syracuse University 2019-2022

Memberships

Alpha Omega Epsilon 2019-2022
Beta Beta Beta 2021-2022
ATP-BIO Scholar Leadership Council 2022-2025
Graduate Biosciences Society 2025-Present