Athena Chien

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Seeking an internship Summer 2025 in sensing, medical devices, or signal processing.

EDUCATION

Ph.D. Biomedical Engineering, Georgia Institute of Technology & Emory University, Atlanta, GA — 2021 – (exp) 2026
NSF Graduate Research Fellow, PI: Dr. Craig Forest

M.S. Electrical & Computer Engineering, Georgia Institute of Technology, Atlanta, GA — 2022 – (exp) 2025
Signal Processing & Bioengineering (GPA 3.90/4.00)

B.S. Bioengineering, Rice University, Houston, TX — 2017 - 2021
cum laude, Distinction in Research, Tau Beta Pi Honors (GPA 3.83/4.00)

SKILLS

Engineering *Biomedical Sensing/Electrophysiology (EMG, ECG, PPG), Medical Imaging Systems (MRI, ultrasound, CT), Digital Signal Processing, Machine Learning (Spring 2025), circuit modeling, CNC Milling, 3D printing, MEMS design, CAD modeling, PCB design, Tensile Testing, Rheology Testing*

Software *Python, Matlab, Labview, Arduino, NOVA (for impedance measuring), EAGLE, AutoCAD, LTSpice, Adobe Illustrator, HTML.*

Laboratory *Mammalian Cell Culture, Fluorescent Live/Dead Staining Assays, Immunostaining, ELISAs.*

PUBLICATIONS

Lewallen, C., **Chien, A. J.,** Maminishkis, A., Hirday, R., Reichert, D., Sharma, R., Wan, Q., Bharti, K., Forest, C. (2023) A Biologically Validated Mathematical Model for Decoding Epithelial Apical, Baso-lateral, and Paracellular Electrical Properties. *American Journal of Cell Physiology.* 2023 Dec.

Kim , C., **Chien, A. J.,** Tippur, M., Sung C. (2021) Fabrication and Characterization of I-cord Knitted SMA Actuators. RoboSoft 2021, Paper.

Kim, Y. S., **Chien, A. J.,** Guo, J. L., Smith, B. T., Watson, E., Pearce, H. A., Koons, G. L., Navara, A. M., Lam, J., Scott, D. W., Grande-Allen, K. J., & Mikos, A. G. (2020). Chondrogenesis of cocultures of mesenchymal stem cells and articular chondrocytes in poly(l-lysine)-loaded hydrogels. *Journal of Controlled Release*, *328*, 710–721.

Williams, K. M., Wang, H., Paulsen, M. J., Thakore, A. D., Rieck, M., Lucian, H. J., Grady, F., Hironaka, C. E., **Chien, A. J.,** Farry, J. M., Shin, H. S., Jaatinen, K. J., Eskandari, A., Stapleton, L. M., Steele, A. N., Cohen, J. E., & Woo, Y. J. (2020). Safety of photosynthetic Synechococcus elongatus for in vivo cyanobacteria–mammalian symbiotic therapeutics. *Microbial Biotechnology*, *13*(6), 1780–1792.

WORK EXPERIENCE

PhD Candidate, Georgia Institute of Technology & Emory University — 2021-Current
- Defined own bioengineering research problem targeting lung infection leveraging expertise from interdisciplinary collaborators.
- Build and validate cell chamber with custom electrodes to measure impedance and fit electrical models.
- Lead research team of 6, mentor 3 undergraduate students, contribute to grant proposals and advise industry sponsor.

Graduate Research Intern, Bharti Lab, NIH National Eye Institute — Summer 2022
- Designed and tested electrophysiology chamber with perfusion discovering toxicity of silver chloride electrodes on human induced pluripotent stem cell-derived retinal pigment epithelia.

Research Intern, Sung Robotics Lab, University of Pennsylvania, selected NSF REU — Summer 2020
- Modeled shape memory alloy wire for origami sheet actuation.
- Determined components and designed PCB for a responsive origami sheet.
- Fostered community through virtual lab lunches and investigated gripper technology in journal club

Undergraduate Researcher, Mikos Biomaterials Group, Rice University 2018 – 2020

- Evaluated the physicochemical properties (swelling and degradation) of a bioactive hydrogel for cartilage repair.

SELECTED ENGINEERING EXPERIENCE

Impedance Spectroscopy System for Measuring Permeability Changes in Epithelial Tissue
PhD Research
- Propose novel biological study of permeability changes in tissue during transepithelial immune cell migration
- Demonstrate reliability and repeatability of impedance measurements on lung tissue
- Resulted in sponsored research agreement with World Precision Instruments and second-author publication

Breath Detecting Aerosolization Device (BDAD)
2021 Senior Capstone, 2023 Consultant, Zewski Corporation, Team of 6
- Detected infant inhalation using ECG to deliver aerosol drug for preterm infants with respiratory distress syndrome
- Led signal processing team, wrote and edited technical reports, presented quarterly updates to sponsor.
- **Won Best Interdisciplinary Engineering Design Award and Outstanding Bioengineering Design**

Cantilever MEMS device for Tremor Detection (2023 course project)
BioMEMS Course, Team of 5
- Defined cantilever dimensions and fabrication technique for detecting desired acceleration.

Electromyography (EMG) Array for Prosthetics (2022 course project)
Biomedical Sensing Course, Team of 4
- Designed and built 12 custom PCB electrode array to determine ideal electrode placement for best prosthetic signal.

POSTERS

Chien, A., Lewallen, C., Cui, G., Cegla, A.V., Lull, E., Khor, H., McCarty, N.A., Forest, C., "Rapid and Accurate Transepithelial Resistance Measurement of Bronchiolar Epithelium using Impedance Spectroscopy and RCRC Model," 69th Annual Meeting of the Biophysical Society; February 15-19, 2025; Los Angeles, CA. Poster. (*submitted*)

Chien, A., et al. "Device for Rapid Transepithelial Resistance Measurements During Stimulus Administration," Cellular and Tissue Engineering Symposium; May 17, 2024; Atlanta, GA. Poster.

Chien, A. J., et al. "Optimization of Mammalian Cell Culture Media for In Vitro Photosynthetic Co-culture with Cyanobacteria *Synechococcus elongatus,*" Biomedical Engineering Society; October 14-17, 2020; Virtual. Poster.

Chien, A. J., Wang, H., Wu, M. W., Hironaka, C. E., Farry, J. M., Williams, K. M., Paulsen, M. J., Stapleton L. M., Steele A. N., Woo, Y. J. "Optimization of Mammalian Cell Culture Media for In Vitro Photosynthetic Co-culture with Cyanobacteria *Synechococcus elongatus,*" Biomedical Engineering Society; October 14-17, 2020; Virtual. Poster.

INVITED TALKS

- *Electrochemical Impedance Spectroscopy (EIS) and Platinum Electrodes for Nontoxic, Accurate Measurements of Transepithelial Resistance (TER).* BME Department Seminar 2024.
- *Epithelial Electrophysiology.* Bioelectromagnetics course 2024.
- *Epithelial Electrophysiology and Other Uses of BMED 3110 Knowledge.* Quantitative Engineering Physiology Lab course 2023.

LEADERSHIP & COMMUNITY SERVICE

Co-President (2024-current), Education & Outreach Committee Chair (2023-24), Bioengineering and Biosciences United Graduate Student Association (2022-current)

Treasurer (2021-2022), Biomedical Engineering Department Graduate Student Advocacy Board

SELECTED AWARDS

- BME Outstanding Entrepreneurship/Translational Research Award 2024
- Petit Institute of Bioengineering & Bioscience Award for Outreach and Service 2023
- NSF Graduate Research Fellowship Recipient 2021-2025