ANNIKA MCENROE

Biomedical Engineer | Division 1 Athlete

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SUMMARY

Biomedical Engineering graduate student at Duke University pursuing a Master's with a Certificate in Medical Technology Design. Experienced in biomechanics, bio-transport, and organ-on-a-chip systems, with skills in device prototyping, computational modeling (COMSOL, Autodesk Fusion), and microfabrication techniques including photolithography. Division I student-athlete and Olympic Trials qualifier bringing discipline, resilience, and leadership to medical device design teams. Aspiring medical device entrepreneur, innovating for clinical impact.

EDUCATION

Masters in Biomedical Engineering, Duke University- Pratt School of Engineering — Aug '25 — Present, Durham, North Carolina

- Relevant Coursework: Advanced Manufacturing and Design (AutoDesk Fusion), Management of High-Tech Industries, Physiology
- Activities: D1 Duke Women's Swim Team (2025-present)

Bachelor of Science in Bioengineering, University of California, Berkeley (GPA: 3.863) — Jan '21 — May '25, Berkeley, California

- Relevant Coursework: Orthopedic Biomechanics, Biological Transport Phenomena (COMSOL), BioMEMS, Designing for the Human Body, Biomechanics Analysis and Design (FeBio), Synthetic Biology Lab, Cell Engineering, Thermodynamics and kinetics, ENGIN 7 (Matlab)
- Activities: D1 Cal Women's Swim Team (2021- 2025), Bioengineering Honors Society (August 2022- 2025).

PROFESSIONAL EXPERIENCE

Terasaki Institute for Biomedical Innovation (TIBI) — Jun '24
Intern — Woodland Hills, California

- Collaborated on the research and development of a 2-tier, 5-layer PMMA Blood Brain Barrier chip, which integrated neural endothelial cells, pericytes, and microglial cells to study microglial senescence.
- Partnered with scientists to apply microfluidic prototyping skills in fabricating organ-on-chip models with PDMS and PMMA, advancing biomimetic platforms for disease modeling and translational medical device applications.

UC Berkeley-Waqas Khalid lab — Jan '23 — May '24
Undergraduate Researcher — Berkeley, California

- Contributed to prototyping of exoskeleton systems by integrating biomechanics, material testing, and EMG sensors, applying research insights to improve assistive device design for stroke rehabilitation.
- Applied bio-sensing techniques using impedance spectroscopy with carbon nanotube sensors to generate and analyze biomolecule concentration detection curves.

Genentech Mentorship Program- Andrew Madsen — Aug '22 — May '24
Mentee — Berkeley, California

- Engaged with professionals in biotechnology and medical technology, gaining insight into how device design integrates with clinical research, regulatory pathways, and commercialization strategies essential to bringing products to market.
- Applied understanding of translational challenges and opportunities from one-on-one mentorship interactions to strengthen approaches to medical device development.

CUBEInC (Clemson University Biomedical Engineering Innovation Center) & The Hawkins Foundation — Aug '20 — Feb '21
Data Analysis Intern — Greenville, South Carolina

- Analyzed data from a 400-participant orthopedic clinical trial, performing cleaning, organization, and management to ensure accuracy and reliability of clinical research findings.

SCHOLARLY EXPERIENCE

Posture Correction Device, UC Berkeley- Designing for the Human Body — Aug '24 — Dec '24

- Led a team to developing a wearable posture correction device integrating an IMU, ESP32, and vibration motor in a compact backpack-style form, providing real-time feedback to improve user posture and engagement.

Positive-Pressure Flow in DLD Arrays, UC Berkeley- BioMEMS & Bionanotechnology Lab — Jan '25 — May '25

- Collaborated with Panazee Inc. to improve deterministic lateral displacement (DLD) array by designing and testing microfluidic devices with positive-pressure flow, enhancing immunoassay bead separation efficiency and device reliability.

Scholarly Research

- Microfluidics: Utilized COMSOL modeling to optimize micro-needle delivery for administration of dopamine and CDNF in Parkinson's treatment, enhancing targeted delivery to the substantia nigra while reducing systemic side effects
- BioMEMS: Conducted a literary search on the evolution of Liver-on-a-chip fabrication methods, assessed the limitations and proposed improvements to the design in order to increase manufacturing and detection efficiency

SKILLS

Medical Device Skills: Biomechanics & Human-Centered Design, Medical Device Design & Prototyping (wearables, organ-on-chip, PMMA/PDMS fabrication), Microfluidics & BioMEMS,
Computational Modeling & Simulation (Autodesk Fusion, COMSOL, FeBio, MATLAB), Collaboration,
Leadership & Project Management
Technical Skills: MATLAB, COMSOL, Autodesk Fusion 360, FeBio, Laser Cutting, Excel
Laboratory Skills: Organ-on-chip fabrication, Photolithography, Cell Culture, NMR & Impedance Spectroscopy, Confocal Microscopy, PCR, Immunocytochemistry, Titration, Crystallization, Thin Layer & Column Chromatography

ADDITIONAL INFORMATION

Athletic Accomplishments

- Olympic Trial Qualifier (2020)
- 2x NCAA Qualifier
- CSCAA Scholar All- American
- ACC Academic Honor Roll