

Frank Benson Myers III

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OBJECTIVE

I am interested in leveraging microsystem technology to address new questions in biology, enable cell-based therapies, and improve worldwide access to medical diagnostics.

EDUCATION

Ph.D. Candidate, Bioengineering (2012)

University of California, Berkeley (joint program with UCSF)

- Dissertation Topic: *Electrophysiology-Activated Cell Sorting* (advisor: Luke P. Lee)
- **NDSEG Graduate Research Fellowship** (2008-2011)
- **Siebel Scholar**, Class of 2012
- **Marine Biology Laboratory Physiology Summer Course**, Woods Hole, MA (2011)
- Summer Research at Center for TB Research, Stellenbosch University, South Africa (2010)
- Coursework: MEMS, Microfluidics, Microfabrication, Electrochemistry, Biophysical Chemistry, Cell Biology, Developmental Biology, Stem Cell Laboratory, Biomedical Instrumentation, Microscopy, Gross Anatomy, Surgical Observations

B.S., Electrical and Computer Engineering, *Summa Cum Laude* (2006)

North Carolina State University

- History Minor
- Exchange student at University College Cork, Ireland
- University Honors Program
- Engineering Entrepreneur's Program
- Coursework: Microelectronics, Electromagnetics, Digital ASIC Design, CMOS Circuits, Embedded Systems, Molecular Electronics, Computational Intelligence, Linear Systems, Computer Architecture

CORE COMPETENCIES

- Microfluidics and MEMS design/fabrication
- Biomedical instrumentation
- Embedded systems and lab automation
- Computational modeling
- Cell biology

AWARDS & ACTIVITIES

- **Outstanding Graduate Student Instructor Award** (Biomedical Instrumentation, 2011)
- **1st Place, Bears Breaking Boundaries Research Proposal Competition** (2008)
- **2nd Place, Big Ideas Research Competition** (2011)
- **Best Paper Award, Berkeley Sensor and Actuator Center** (Fall, 2011)
- Participant in *Future Scientist*, a pilot outreach program in Puerto Alegria, Peru (2009)
- Editor, *Berkeley Science Review* (2009-Present)
- Graduate Fellowship Advisor, Berkeley Bioengineering Department (2009-Present)
- Graduate Admissions Committee Member, Berkeley Bioengineering Department (2008-2009)
- **Co-founder, Berkeley Point-of-care Diagnostics Idea Lab** (2008-Present)
- Equipment Superuser, Berkeley Marvell Nanofabrication Lab (2009-Present)
- **Founder and President, NCSU Underwater Robotics Club** (2004-2007)
- Awarded 6 merit scholarships at NCSU (2003-2006)
- Certifications: EIT (2007), A+ (2003), Microsoft Certified Application Developer (2003)

ACADEMIC RESEARCH & TEACHING EXPERIENCE

Graduate Student Researcher: Prof. Luke Lee Lab, UC Berkeley 2007-Present

- Developing microsystems for high-throughput sorting of stem cell-derived cardiomyocytes.
- Leading collaborations with tissue engineers at Stanford and UCSF.
- Participating in TB diagnostics collaboration with Stellenbosch University, South Africa
- Numerous lab responsibilities including equipment maintenance, website development, training

Graduate Student Instructor: Bioengineering, UC Berkeley 2010

- Established new biomedical instrumentation teaching lab for hardware/software prototyping.
- Developed biomedical instrumentation lab exercises: EKG heart monitor, alcohol monitor, audio signal processing.
- Lectured on topics in biomedical instrumentation
- Assisted graduate students with NSF fellowship applications (63% success rate).

Research Assistant: Prof. Veena Misra Lab, NC State University 2007

- Investigated redox-active molecules and conductance-switching polymers for memory applications.
- Fabricated devices, performed electrical characterization experiments, and characterized with SEM.

Teaching Assistant: Electrical Engineering, NC State University 2006-2007

- Taught problem sessions for classes in circuit analysis and engineering mathematics. Prepared & presented review lectures, held office hours, graded homework.
- Taught electronics experimentation lab for students at local community college enrolled in NCSU's distance education program.

Undergraduate Researcher: Prof. Maysam Ghovanloo Lab, NC State University 2005-2006

- Designed and prototyped PCBs for an implantable neural stimulator including: a filter/amplifier board for wireless transmission, a USB PC interface which performed frequency shift-key (FSK) modulation of outgoing data, and an LED matrix for demonstration.
- Wrote software which applied the system as a demonstrational 128-site intra-cortical visual prosthesis.

Founder/President: Underwater Robotics Club, NC State University 2004-2006

- Founded an ongoing student organization and led an interdisciplinary team of 16 students. Raised over \$20,000 in corporate sponsorship, secured lab space, established faculty advisors, led bi-weekly meetings, and mentored senior projects.
- Led construction of an autonomous submersible vehicle. Developed DSP-based acoustic navigation system. Also contributed to fuzzy-logic control, image processing, machining, and construction.
- Led team to two international competitions in San Diego.
- Presented for industry, students, faculty, and press. Developed website (www.ncsurobotics.org).

INDUSTRY EXPERIENCE

Private Consulting, Bay Area, CA 2010-Present

- Developed finite-element electrical models for a medical device company
- Developing atomic layer deposition processes in the Berkeley Nanolab for a biomaterials company
- Developing an embedded controller and UI for a clinical diagnostic device company

Intern: ABB US Corporate Research, Raleigh, NC 2004-2005

- Built a Microsoft .NET/SQL Server 2000 business intelligence application to streamline operations and boost efficiency in the Power Technologies division
- Worked with departmental leaders to analyze and develop business requirements
- Consulted with Microsoft representatives to determine implementation strategies

Software Developer: EM Service, Ltd., Raleigh, NC 2002-2004

- Wrote database applications for the company's first product, a customizable flat-rate pricing manual for small heating & air repair businesses.
- Assisted with drafting company's first business plan and identifying marketing avenues
- Designed website (www.emserviceltd.com) and wrote online marketing material

BOOK CHAPTERS

L. Lee and **F. Myers**. "*Optical Microfluidics for Molecular Diagnostics*". Methods in Bioengineering: Biomicrofabrication and Biomicrofluidics. Artech House (2010).

JOURNAL ARTICLES AND CONFERENCE PROCEEDINGS

F. Myers, C. Zarins, L. Lee, O. Abilez. "*Electrophysiological Cell Sorting: Automated Identification of Differentiated Stem Cells as a Function of Electrical Signals*". (submitted)

D. Mitra, T. Chen, **F. Myers**, and L. Lee. "*Selective Separation of Prokaryotic Cells in Mixed Cultures using Electrochemical Lysis*". (in preparation)

F. Myers, J. Silver, O. Abilez, C. Zarins, L. Lee. "*Stencil Patterning Method Improves Uniformity of Human Pluripotent Stem Cell Colonies*". (in preparation)

F. Myers, O. Abilez, C. Zarins, L. Lee. "*Stimulation and Artifact-Free Extracellular Electrophysiological Recording of Cells in Suspension*". Proceedings of the IEEE Engineering in Medicine and Biology Conference (EMBC), Boston, MA (2011)

F. Myers, R. Henrikson, L. Xu, L. Lee. "*A Point-of-Care Instrument for Rapid Multiplexed Pathogen Genotyping*". Proceedings of the IEEE Engineering in Medicine and Biology Conference (EMBC), Boston, MA (2011)

F. Myers, O. Abilez, C. Zarins, L. Lee. "*A Microfluidic Device for Electrophysiological Sorting of Pluripotent Stem Cell Derived Cardiomyocytes*". MicroTAS. Groningen, Netherlands (2010).

F. Myers and L. Lee. "*Innovations in Optical Microfluidic Technologies for Point-of-Care Diagnostics*". Lab on a Chip 8, 2015-2031 (2008).

S. Sarkar, A. Suresh, **F. Myers**, J. Muth, V. Misra. "*Modulation of the Current Characteristics by Discrete Molecular Redox States in Hybrid IGZO-Molecular Thin-Film Transistors*". Applied Physics Letters Vol. 92, Issue 22 (2008).

F. Myers, J. Simpson, M. Ghovanloo. “*A Wideband Wireless Neural Stimulation Platform for High-Density Microelectrode Arrays*”. Proceedings of the IEEE Engineering in Medicine and Biology Conference (EMBC), New York, NY (2006).

CONFERENCE ABSTRACTS

F. Myers, R.S. McIsaac, R.D. Mullins. “*Dynamic Instability of Actin-like ParM Proteins: Theory and Experiment*”. American Society for Cell Biology Annual Meeting. Denver, CO (2011)

R. Henrikson, **F. Myers**, L. Xu, H. Patel, E. Cho, I. Dimov, L. Lee. “*An Integrated Microfluidic System for Multiplexed Genotype Analysis in a Point-of-Care Setting*”. Next Generation Diagnostics Summit. Washington, DC (2011).

F. Myers, J. Silver, O. Abilez, C. Zarins, L. Lee. “*Stencil Patterning Method Improves Uniformity of Human Pluripotent Stem Cell Colonies*”. International Society for Stem Cell Research 9th Annual Meeting, Toronto, Canada (2011).

F. Myers, O. Abilez, C. Zarins, L. Lee. “*Automated Sorting of Stem Cell Derived Cardiomyocytes based on Electrophysiology*”. Lab Automation Conference. Palm Springs, CA (2011).

F. Myers, O. Abilez, C. Zarins, L. Lee. “*Electrophysiological Sorting of Pluripotent Stem Cell Derived Cardiomyocytes in a Microfluidic Platform*”. BMES Annual Meeting. Austin, TX (2010).

D. Breslauer, **F. Myers**, B. Turner, E. Lee, S. Muller, L. Lee. “*Silk for High Aspect Ratio Micromolding*”. BMES Annual Meeting. Austin, TX (2010).

O. Abilez, **F. Myers**, C. Zarins, L. Lee. “*Electrically Activated Cell Sorting of Induced Pluripotent Stem Cell-Derived Cardiomyocytes*”. Symposium on Cardiovascular Regenerative Medicine. Boston, MA (2010).

PATENT APPLICATIONS AND INVENTION DISCLOSURES

O. Abilez, F. Myers, C. Zarins, L. Lee “*Electrophysiological Cell Cytometry and Sorting*” United States Patent Application #61/474,213. Stanford University Invention Disclosure Case #S10-370.

F. Myers, J. Silver, O. Abilez, C. Zarins, L. Lee. “*Stencil Patterning Method for Generating Highly Uniform Stem Cell Colonies*”. UC Berkeley Case # B12-020

R. Henrikson, F. Myers, L. Lee. “*Versatile Riboswitch-Based Microfluidic Device for Disposable Point-of Care Diagnostics.*” UC Berkeley Case #B09-046.

D. Breslauer, F. Myers, B. Turner, S. Muller, L. Lee. “*Biocompatible and Biodegradable Microneedles Made from Silk*”. UC Berkeley Case #B11-071.

INVITED TALKS

“An Integrated Microsystem for Electrophysiology-Activated Cell Sorting (EPACS)”, Berkeley Sensor and Actuator Center, September 2011 (*Winner of Best Presentation Award*)

“Electrophysiology-Activated Cell Sorting”, Berkeley Stem Cell Center Annual Retreat, May 2011

“Biomedical Microdevices”. Bioengineering Freshman Seminar, UC Berkeley, March 2009, March 2010

“Innovations in Optical Microfluidic Diagnostics”. Point-of-Care Diagnostics Seminar Series, UC Berkeley, November 2008

REFERENCES

Luke Lee, PhD

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