

Minh-Chau N. Le

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EDUCATION

- University of Florida (UF)** - National Science Foundation Graduate Research Fellow 08/2019 – Present
Doctor of Philosophy in Mechanical Engineering – GPA: 4.0/4.0
Research Advisor: Z. Hugh Fan
- University of Central Florida (UCF) – The Burnett Honors College** – Orlando, FL 08/2015 – 05/2019
Bachelor of Science in Mechanical Engineering – GPA: 4.0/4.0 – Top Honor Graduate, Honors in the Major Graduate
Minor: Music

RESEARCH EXPERIENCE

Microfluidics and BioMEMS Laboratory – Gainesville, FL 08/2019 – Present
Graduate Research Assistant

- Design microfluidics devices for the isolation and detection of disseminated tumor cells and exosomes
- Fabricate devices using standard photolithography process and equipment in Class 100-1000 cleanroom
- Simulate and analyze fluid flow behavior in microfluidic devices using COMSOL Multiphysics
- Isolate and detect disseminated tumor cells from clinical bone marrow samples using microfluidic devices
- Isolate exosomes using ultracentrifugation and characterize using nanoparticle tracking analysis

UCF Biomaterials for Tissue Engineering and Cancer Research Lab – Orlando, FL 03/2016 – Present
Research Assistant

- Designed and conduct undergraduate honors thesis studying the influence of biomaterial scaffold mechanical and chemical properties on breast cancer cell proliferation, morphology, and migration
- Fabricated biomaterial scaffolds with varying mechanical and chemical properties
- Characterized biomaterial scaffolds using scanning electron microscopy (SEM) imaging
- Performed compression testing on dry and wet scaffold samples to determine and compare yield points and Young's moduli
- Characterized cell behavior using fluorescence microscopy, Alamar Blue assay, and Dil, Hoescht, Phalloidin, and DAPI staining

Harvard University John A. Paulson School of Engineering and Applied Sciences – Cambridge, MA 06/2017 – 08/2018
Research Intern – Research Experiences for Undergraduates Program

- Assisted in development of ear tubes featuring enhanced fluid flow and low bacterial and cell adhesion
- Assisted in securing over \$100,000 in seed funding for start-up company
- Designed a three-part 3D-printable mold system to rapidly manufacture ear tubes with minimal flash
- Created prototypes using additive manufacturing (direct-ink-writing) and mold casting techniques
- Modified material surface using immobilized liquid layer technique
- Characterized surfaces with goniometer and SEM imaging
- Designed a flow setup to measure and analyze effect of immobilized liquid layer on the Young-Laplace pressure in the ear tubes

INDUSTRY EXPERIENCE

UCF/Lockheed Martin College Work Experience Program – Orlando, FL 02/2018 – 05/2018
Mechanical Design Engineer – Internal Research and Development

- Designed and tested prototype parts for energy-efficient and compact targeting pods and surveillance systems for military aircraft
- Modeled multiple mechanical components for gimbal, surveillance, imaging, and targeting pod systems using PTC Creo
- Analyzed structure stiffness, stress, and deflection under specified loads

TECHNICAL SKILLS

Computer Skills

COMSOL Multiphysics, PTC Creo Parametric; SolidWorks; C Programming Language, MATLAB; Simulink; LabVIEW; G-Code; Mathcad; MS Office

Laboratory Skills

Microfluidic Device Fabrication (Photolithography); Nanoparticle Tracking Analysis; Additive Manufacturing (Direct-Ink-Writing and Stereolithography); Mechanical Tester; Goniometer; Optical Microscopy; Confocal Microscopy; X-ray Diffraction; Scanning Electron Microscopy; Transmission Electron Microscopy; Profilometry; Fourier Transform Infrared Spectroscopy; Atomic Force Microscopy; Porous Biomaterial Scaffolds Production; Cell Culture

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ENGINEERING PROJECTS

Soft Robotics for Hand Rehabilitation in Stroke Patients – Team Lead 08/2018 – 05/2019

- Managed and motivated a team of seven members to develop physical therapy device for restoring stroke patient’s hand motions
- Proposed idea for senior engineering design project and secured funding from department
- Developed a cable-driven hand rehabilitation device featuring a feedback control system to detect and augment patient’s intent
- Designed and analyzed cable-driven actuation system for mimicking flexion and extension motions in the human hand
- Oversaw manufacturing process that included additive manufacturing molds and casting silicone elastomers
- Assisted in designing a feedback control system that featured a PID controller, a force-sensitive resistor, and a servo motor

Selection of Materials and Process for Hip Prosthesis – Team Lead 09/2017 – 12/2017

- Analyzed components of a hip prosthesis and translated design requirements into function, objectives, and constraints
- Derived materials indices and consider manufacturing processes for materials selection

LEADERSHIP EXPERIENCE

UF Graduate Society of Women Engineers (UF GradSWE) – Gainesville, FL 08/2019 – Present

Secretary/Treasurer (04/2020 – Present)

- Oversee all records and correspondence as they pertain to the external workings of the organization
- Oversee the budget of the section

UF Mechanical and Aerospace Engineering Graduate Student Council (MAE-GSC) – Gainesville, FL 08/2019 – Present

Student Representative (04/2020 – Present)

- Represent MAE-GSC at the College of Engineering and University levels.
- Serve as head of committee and point of contact for MAE Faculty Candidate Luncheons.

Member (08/2019 – 04/2020)

- Organize social and networking events fostering a cohesive, collaborative, and professional department
- Mentor undergraduate students at departmental recruitment events
- Present research poster and give lab tours to visiting students

Biomedical Engineering Society at UCF – Orlando, FL

09/2015 – 05/2019

President (05/2017 – 05/2019)

- Managed a team of eight officers and promote member participation
- Organized and lead soft robotics and 3D printing workshops for student members
- Initiated two arm prosthetics build projects to provide hands-on opportunities for student members
- Connected undergraduates with on-campus research opportunities in biomedical engineering
- Organized seminars with research professors and industry professionals
- Organized educational outreach STEM Day activities to introduce biomedical engineering to K-12 students

Secretary (05/2016 – 05/2017)

- Managed internal affairs, including membership, attendance, weekly emails, event announcements, and promotional flyers
- Organized all officer meetings, general body meetings, and social activities

Founding Social Media Chair (05/2015 – 05/2016)

- Managed the image of the organization on a variety of social media platforms
- Designed display boards, flyers, and the website

COMMUNITY SERVICES

Society of Women Engineers (Space Coast Chapter) – Melbourne, FL

08/2017 – Present

Member/Volunteer

- Mentor K-12 girls at “Introducing Girls to Engineering” and “That’s Engineering” workshops held annually
- Organize and co-lead multiple workshop modules (20 girls/module) with hands-on activities on science and engineering concepts

Elevation Fellows Program – Orlando, FL

12/2015 – 05/2019

Mentor/Volunteer

- Mentored students from under-served high schools in the community
- Met one-on-one with students to provide guidance with career paths, college applications, and financial assistance
- Volunteered at college-preparation boot camps, help build list of colleges, and review personal statements

TrackShack – Orlando, FL

09/2015 – 05/2019

Volunteer

- Assisted with general setup/cleanup, course marshalling, finish-line water, and race medals on race days
- Races benefit the Track Shack Youth Foundation, which supports local youth athletic programs and promotes youth health

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COMMUNITY SERVICES

Provost Scholars Mentoring Program – Orlando, FL 09/2016 – 05/2017

Mentor/Volunteer

- Mentored three first-year honors students
- Provided guidance with their transition to college

Orange County Public Schools – Orlando, FL 09/2015 – 12/2015

Volunteer

- Organized weekly classroom activities for students at local under-served elementary schools
- Promoted the importance of education and encouraged the pursuit of higher education

EXTRACURRICULAR ACTIVITIES

Sparks Magazine at UCF – Orlando, FL 09/2015 – 05/2019

Writer/Photographer

- Fostered understanding and appreciation of the Asian and Pacific Islander American (APIA) experience
- Conducted interviews and compose articles on topics of interest in the APIA community
- Contributed to publications distributed to the Central Florida community every semester

UCF Performing Arts Program – Orlando, FL 01/2016 – 05/2019

Concert Band Percussionist

- Performed at multiple public band and orchestra concerts throughout the year

Jammin' Knights Percussionist

- Provided entertainment and spirit at UCF basketball, baseball, and spring football games

UCF TRiO PRIME STEM – Orlando, FL 08/2017 – 02/2018

Mentor/Tutor

- Provided academic support services to first-generation and/or low-income students
- Tutored students in math, science, and engineering courses and helped over 40 STEM student matriculate into their majors

The Burnett Honors College – Orlando, FL 06/2016 – 08/2016

Peer Ambassador

- Served on the orientation team as an Honors College ambassador
- Assisted with academic schedule planning and class registration

AWARDS, HONORS, AND ACHIEVEMENTS

National Science Foundation Graduate Research Fellowship	2019
University of Florida Graduate School Preeminence Award	2019
Astronaut Scholarship Foundation – Astronaut Scholar (Awarded to 50 STEM students in the US)	2018
Barry Goldwater Foundation – Honorable Mention	2018
UCF Order of Pegasus (Highest honor for a student at UCF; Awarded to 22 out of 66,000+ students)	2018
National Science Foundation Research Experiences for Undergraduates	2017 – 2018
Harvard University International Genetically Engineered Machine Biohackathon – 1 st Place	2018
UCF Distinguished Undergraduate Research Award	2018
UCF Office of Undergraduate Research Presentation Travel Award	2018
UCF Emerging Leader Scholarship	2017
UCF Research and Mentoring Program Fellowship	2017
UCF Honors in the Major Scholarship	2017
Harvard University Center for Nanoscale Systems Poster Session – 3 rd Place	2017
UCF President's Honor Roll	2015 – 2017
UCF Showcase of Undergraduate Research Excellence Judges' Choice Award	2017
UCF College of Engineering and Computer Science Alumni Chapter Scholarship	2017
UCF Office of Undergraduate Research Grant	2017
UCF Scholars Award	2017
Women in Defense STEM Scholarship	2017
Jess Parrish Medical Foundation Scholarship	2018
Frederick W. and Grace P. Brecht Scholarship	2017
Mildred R. Keil Memorial Scholarship	2018
UCF Provost Scholarship	2015
Florida Bright Futures Scholarship	2015

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POSTER PRESENTATIONS

1. **Le MN**, Xu K, Wang Z, Beverung S, Steward RL, Florczyk SJ. “The Influence of 3D Porous Chitosan-Alginate Biomaterial Scaffold Properties on the Behavior of Breast Cancer Cells.” *Showcase of Undergraduate Research Excellence*, University of Central Florida, Orlando, FL, April 2019.
2. **Le MN**, Wang Z, Ding B, Ellett K, Florczyk SJ. “Influence of Biomaterial Scaffold Properties on Breast Cancer Cell Morphology and Proliferation.” *Biomedical Engineering Society Annual Meeting*, Georgia World Congress Center, Atlanta, GA, October 2018
3. **Le MN**, Peppou-Chapman S, Cai E, Kreder M, Black NL, Pavlichenko I, Kozin E, Remenschneider A, Aizenberg J, Lewis J. “Optimization of Flow Through Oil-Infused Tympanostomy Tubes.” *Undergraduate Summer Internship Poster Session*, Harvard University, Cambridge, MA, August 2018.
4. **Le MN**, Wang Z, Ding B, Ellett K, Florczyk SJ. “Influence of Biomaterial Scaffold Properties on Breast Cancer Cell Morphology and Proliferation.” *Showcase of Undergraduate Research Excellence*, University of Central Florida, Orlando, FL, April 2018.
5. **Le MN**, Black N, Pavlichenko I, Kozin E, Remenschneider A, Aizenberg J, Lewis J. “Prevention of Occlusion and Cell Adhesion in 3D-printed, Liquid-infused Tympanostomy Tubes.” *Society for Biomaterials Annual Meeting*, Hilton Atlanta, Atlanta, GA, April 2018.
6. **Le MN**, Wang Z, Ding B, Ellett K, Florczyk SJ. “Influence of Biomaterial Scaffold Properties on Breast Cancer Cell Morphology and Proliferation.” *Society for Biomaterials Annual Meeting*, Hilton Atlanta, Atlanta, GA, April 2018. **Protein & Cells at Interfaces Special Interest Group – Honorable Mention**
7. Wang Z, Xu K, Arias I, **Le MN**, Khaled A, and Florczyk SJ. “Processing of Chitosan-hyaluronic Acid Scaffolds to Produce an Optimized Breast Cancer Tumor Microenvironment.” *Society for Biomaterials Annual Meeting*; Hilton Atlanta, Atlanta, GA, April 2018. **Protein & Cells at Interfaces Special Interest Group – 2nd Place**
8. **Le MN**, Wang Z, Ding B, Ellett K, Florczyk SJ. “Influence of Biomaterial Scaffold Properties on Breast Cancer Cell Morphology and Proliferation.” *Biomedical Engineering Society Annual Meeting*, Phoenix Convention Center, Phoenix, AZ, October 2017.
9. Pavlichenko I, Black NL, **Le MN**, Beggs H, Kozin E, Remenschneider AK, Lewis JA, Aizenberg J. “Prevention of Occlusion and Cell Adhesion in 3D-printed, Liquid-infused Tympanostomy Tubes.” *Center for Nanoscale Systems Open House and Poster Session*, Harvard University, Cambridge, MA, October 2017. **3rd Place**
10. **Le MN**, Black N, Pavlichenko I, Kozin E, Remenschneider A, Aizenberg J, Lewis J. “Prevention of Occlusion and Cell Adhesion in 3D-printed, Liquid-infused Tympanostomy Tubes.” *Undergraduate Summer Internship Poster Session*, Harvard University, Cambridge, MA, August 2017.
11. **Le MN**, Wang Z, Ding B, Ellett K, Florczyk SJ. “Influence of Biomaterial Scaffold Properties on Breast Cancer Cell Morphology and Proliferation.” *Showcase of Undergraduate Research Excellence*, University of Central Florida, Orlando, FL, April 2017. **Judges’ Choice Award**

ORAL PRESENTATIONS

1. **Le MN**, Wang Z, Ding B, Ellett K, Florczyk SJ. “Influence of Biomaterial Scaffold Properties on Breast Cancer Cell Morphology and Proliferation.” *Astronaut Scholarship Foundation Innovator’s Gala Technical Conference*, JW Marriott, Washington DC, August 2018.
2. **Le MN**, Peppou-Chapman S, Cai E, Kreder M, Black NL, Pavlichenko I, Kozin E, Remenschneider A, Aizenberg J, Lewis J. “Optimization of Flow Through Oil-Infused Tympanostomy Tubes.” *National Nanotechnology Coordinated Infrastructure Research Experiences for Undergraduates Convocation*, North Carolina State University, NC, August 2018.
3. Arias I, **Le MN**, Ding B, Xu K, Wang Z, and Florczyk SJ. “Influence of Chitosan-alginate Scaffold Stiffness on Bone Marrow Stromal Cell Differentiation.” *Society for Biomaterials Annual Meeting*, Hilton Atlanta, Atlanta, GA, April 2018.
4. **Le MN**, Wang Z, Ding B, Ellett K, Florczyk SJ. “Influence of Biomaterial Scaffold Properties on Breast Cancer Cell Morphology and Proliferation.” *Mechanical and Aerospace Engineering Research Day*, University of Central Florida, Orlando, FL, March 2018. **Best Undergraduate Presentation**
5. **Le MN**, Black N, Pavlichenko I, Kozin E, Remenschneider A, Aizenberg J, Lewis J. “Prevention of Occlusion and Cell Adhesion in 3D-printed, Liquid-infused Tympanostomy Tubes.” *National Nanotechnology Coordinated Infrastructure Research Experiences for Undergraduates Convocation*, Georgia Institute of Technology, Atlanta, GA, August 2017.
6. **Le MN**, Black N, Pavlichenko I, Kozin E, Remenschneider A, Aizenberg J, Lewis J. “Prevention of Occlusion and Cell Adhesion in 3D-printed, Liquid-infused Tympanostomy Tubes.” *Research Experiences for Undergraduates*, Harvard University, Cambridge, MA, August 2017.

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PUBLICATIONS

1. **Le MN**, Khaled A, Steward RL, and Florczyk SJ. “The Influence of 3D Porous Chitosan-alginate Biomaterial Scaffold Properties on the Behavior of Breast Cancer Cells.” In preparation.
2. **Le MN**, Wang Z, Ding B, Ellett K, Florczyk SJ. “Influence of Biomaterial Scaffold Properties on Breast Cancer Cell Morphology and Proliferation.” In preparation.
3. Arias I, **Le MN**, Ding B, Xu K, Wang Z, and Florczyk SJ. “Influence of Chitosan-alginate Scaffold Stiffness on Bone Marrow Stromal Cell Differentiation.” In preparation.
4. Wang Z, Xu K, Arias I, **Le MN**, Khaled A, and Florczyk SJ. “Processing of Chitosan-hyaluronic Acid Scaffolds to Produce an Optimized Breast Cancer Tumor Microenvironment.” In preparation.

COURSE WORK

Fluid Mechanics II, Convective Heat Transfer, Microfluidics and BioMEMS, Conduction Heat Transfer, Engineering Analysis I, Programming in C, Organic Chemistry, Materials Design, Experimental Techniques in Mechanics of Materials.