

Alicia Breanne Dagle

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EDUCATION

Dual Bachelor of Arts and Sciences Degree Program

Columbia University, Fu Foundation School of Engineering, New York, NY

Bachelor of Science in Mechanical Engineering, GPA: 3.50/4.33, Dean's List

Expected May 2018

Clark University, Worcester, MA

Bachelor of Arts in Physics, GPA: 3.94/4.30, Dean's List

Expected May 2018

RESEARCH EXPERIENCE

Wellman Institute for Photomedicine, Massachusetts General Hospital, Cambridge, MA

June 2016 – August 2016

HST Summer Institute for Biomedical Optics, Research Experience for Undergraduates (REU)

Undergraduate Researcher

Advisor: Dr. Seok-Hyun (Andy) Yun

Operated laser and Brillouin microscopy equipment, cultured cells, performed MATLAB analysis. Investigated the Brillouin stiffness measurements of cells under varying osmotic compression conditions. Successfully visualized intracellular components by mapping Brillouin shift.

Clark University, Worcester, MA

January 2015 – May 2016

Experimental Condensed Matter Physics Lab

Undergraduate Researcher

Advisor: Dr. Michael Boyer

Examined surface properties of cuprous oxide nanocubes to better understand their catalytic behavior. Employed atomic force microscopy (AFM), scanning tunneling microscopy (STM), and scanning electron microscopy (SEM) to determine band-gap and visualize surface features.

Johns Hopkins University, Baltimore, MD

June 2015 – August 2015

Computational Sensing and Medical Robotics (CSMR) REU

Undergraduate Researcher

Advisor: Dr. Muyinatu A. Lediju Bell

Researched energy safety limitations and feasibility of implementing photoacoustic imaging to visualize the internal carotid artery during endonasal transsphenoidal surgery for pituitary tumor resection. Constructed phantom for testing, collected photoacoustic data, performed MATLAB analysis, determined the energy required for vessel visualization, and compared the required energy to fluence safety limits.

Worcester Polytechnic Institute, Worcester, MA

June 2014 – August 2014

Bioengineering REU

Undergraduate Researcher

Advisor: Dr. Qi Wen

Researched the effect of vimentin on cellular traction force, spreading area, and stiffness. Cultured cells, prepared polyacrylamide gels with fluorescent beads, captured images with a fluorescent microscope, and performed traction force microscopy (TFM) with a 3-D finite element model utilizing MATLAB and ANSYS. Applied atomic force microscopy to examine stiffness of cells.

PUBLICATIONS

M. A. Lediju Bell, *A.B. Dagle, P. Kazanzides, and E. Bector. Experimental Assessment of Energy Requirements and Tool Tip Visibility for Photoacoustic-Guided Endonasal Surgery, *Proc. SPIE 9708 Photons Plus Ultrasound: Imaging and Sensing*, San Francisco, CA, March 2016.

PRESENTATIONS

Invited Talks:

“Experimental Analysis of Energy Safety Limits for Photoacoustic-Guided Endonasal Surgery.” Poster presented at the Council on Undergraduate Research (CUR) Symposium. Arlington, VA, October 2015.

“Determining the Effect of Vimentin on Cell Traction Force and Stiffness.” Poster presented at Biomedical Engineering Society (BMES) Conference. San Antonio, TX, October 2014.

Campus Talks:

“Probing cellular mechanical properties with noncontact Brillouin Microscopy.” Poster presented at HST Summer Institute for Biomedical Optics. Boston, MA, August 2016.

“Experimental Analysis of Energy Safety Limits for Photoacoustic-Guided Endonasal Surgery.” Poster presented at Johns Hopkins University. Baltimore, MD, August 2015.

“Determining the Effect of Vimentin on Cell Traction Force and Stiffness.” Poster presented at Worcester Polytechnic Institute. Worcester, MA, August 2014.

HONORS/AWARDS

1 st Place Presentation Award for CSMR REU	2015
Henry O. Peabody Scholarship	2013
Daughters of the American Revolution Good Citizenship Award	2013

TEACHING EXPERIENCE

Clark University, Worcester, MA	September 2014 – May 2016
<i>Teaching Assistant</i>	
<u>Honors Advanced Calculus I</u> : Professor Michael Satz, Fall 2014, Fall 2015	
<u>Honors Advanced Calculus II</u> : Professor Michael Satz, Spring 2015, Spring 2016	
<u>Intro to Physics I with Calculus</u> : Dr. Michael Boyer, Fall 2015	
<u>Intro to Physics II with Calculus</u> : Dr. Michael Boyer, Spring 2016	

ADDITIONAL ENGINEERING EXPERIENCE

Siemens Healthineers, Norwood, MA	June 2017 – August 2017
<i>Engineering Intern, Point of Care Division, Sustaining Engineering R&D</i>	
Managed multiple projects, created documentation for review and implementation, updated CAD drawings, and released design changes including design-to-cost savings. Communicated and coordinated with business partners on-site and overseas, including manufacturing and vendors. Researched pressures in commercial products using LabView to perform quality investigations.	

RELATED AND PROFESSIONAL SKILLS

Computer: SolidWorks, MATLAB, LabView, Java, Microsoft Office, LaTeX.
Lab: TFM, AFM, STM, SEM, photoacoustic imaging, ultrasound, and Brillouin microscopy.

LEADERSHIP/SERVICE

Collegiate Ballroom Dance Team, Mentor, New York, NY	2016 – Present
Encouraged new dancers, provided feedback and instruction based on different levels of understanding.	
BMES, Outreach Volunteer, New York, NY	2017
Presented to students at a local high school by detailing varying subjects within the field of biomedical engineering. Assisted students with the assembly of a simple prosthetic hand following a presentation on biomedical engineering concepts.	
Seven Hills Foundation, Worcester, MA	2014 – 2016
Acted as an assistant instructor for a ballroom dance class held at the Seven Hills Foundation, a local day program for adults with mental and physical disabilities. Danced with special needs individuals, encouraged their participation, and spread enthusiasm.	
Unified Sports, Worcester, MA	2013 – 2016
Participated in a Special Olympics program that brings together individuals with varying physical and intellectual disabilities to participate in team sports. Encouraged, supported, and played alongside children in basketball and soccer programs.	
Best Buddies, Worcester, MA	2013 – 2014
Provided a social atmosphere for college-age individuals with physical and mental disabilities who otherwise may be isolated from society. Acted as a peer and friend to create an inclusive environment.	
Innovations Camp Mentor, Worcester, MA	2014
Served as a mentor during a one-week camp for high school aged girls. Organized group activities centered on scientific concepts and mentored an individual with her research project and poster presentation.	

PROFESSIONAL AFFILIATIONS

Society of Physics Students (SPS)	2015 – 2016
Biomedical Engineering Society (BMES)	2014 – 2015