

CAROLINE CVETKOVIC

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EDUCATION

University of Illinois at Urbana-Champaign

Urbana, IL

Ph.D. in Bioengineering, GPA: 3.94/4.0

December 2016

Dissertation Title: "Biological Building Blocks for 3D Printed Cellular Systems"

M.S. in Bioengineering, GPA: 3.91/4.0

May 2013

Thesis Title: "The Development Of A Skeletal Muscle Bio-Actuator Using 3-D Stereolithography"

B.S. in Bioengineering, Minor in Spanish, GPA: 3.73/4.0

May 2011

RELEVANT WORK EXPERIENCE

Laboratory of Integrated Biomedical Micro/Nanotechnology & Applications

Urbana, IL

Graduate Research Assistant; Adviser, Dr. Rashid Bashir

2011 – Present

- Authored and contributed to 6 original research articles and 2 review articles on 3D printed living cellular systems
- Invented a 'walking' skeletal muscle-powered biological robot and various methods to incorporate motor neurons
- Research highlighted in Popular Mechanics, NBC, Yahoo, Forbes, CNET, and Science Daily

National Science Foundation (NSF) Traineeships

Urbana, IL

Integrative Graduate Education and Research (IGERT) Trainee

2011 – 2016

- Selected for two multidisciplinary NSF programs, including graduate traineeship and a Science and Technology Center
- Worked with a team of graduate trainees on Student Leadership Council to organize a bi-monthly research seminar series and annual symposium while fostering communication between and among students, faculty, and Executive Committee
- Developed and implemented STEM and nanotechnology outreach for local community members and K-12 students

LEADERSHIP EXPERIENCE

Girls' Adventures in Math, Engineering, and Science (G.A.M.E.S.) Camp

Urbana, IL

Camp Counselor, Lab Assistant, and Guest Lecturer

2009 – 2015

- Worked with a team of 50 students to oversee an academic summer camp through the Women in Engineering program
- Inspired interest in STEM by developing and teaching a comprehensive high-school level Bioengineering curriculum
- Developed and presented Ethics Modules related to bioengineering research

1867 Society

Urbana, IL

Executive Board Member – President and Student Adviser

2009 – 2014

- Led an effort to raise student awareness about the importance of supporting the campus through donations
- Managed the promotion of student philanthropy at Illinois by increasing organization participation by 400%
- Developed relationships with the Vice Chancellor for Institutional Advancement, the UI Foundation, and alumni

Learning in Community (LINC) Partnership

Urbana, IL

Project Manager

Spring 2012

- Facilitated and managed an interdisciplinary service-learning course of more than twenty undergraduate students
- Oversaw the design and implementation of projects to improve the organization and output of a local nonprofit
- Acted as a liaison between the students, the College of Engineering, and the partner (Smile Healthy)

RELEVANT SKILLS

Mammalian cell culture, stereolithographic 3D printing, hydrogels, microscopy (phase, fluorescence, confocal, SEM), immunohistochemistry, electrical stimulation of tissues, mentoring, project management, basic Spanish proficiency

HONORS, AWARDS, AND SCHOLARSHIPS

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|-------------|--|-------------|--|
| 2007 – 2008 | Illinois General Assembly Scholarship | 2011 – 2016 | Support for Under-Represented Groups in Engineering Fellowship (UIUC) |
| 2007 – 2011 | Campus Honors Program Chancellor's Scholar | 2015 | Session Co-Chair, Student and Young Investigator Society, TERMIS World Congress |
| 2007 – 2011 | Edmund J. James Scholar and Dean's List | 2016 | "Image of the Month" Award, Institute for Genomic Biology (UIUC) |
| 2010 – 2011 | Illinois Scholars Undergraduate Research Program | 2016 | Clinical and Translational Research Course for Ph.D. Students, NIH Clinical Center |
| 2010 – 2011 | Philip Lazarra Memorial Scholarship | | |
| 2010 | LeaderShape® Institute™ Graduate | | |
| 2011 | Senior 100 Honorary | | |

PEER-REVIEWED JOURNAL ARTICLES

- Cvetkovic C*, Raman R*, Chan V, Williams BJ, Tolish M, Bajaj P, Sakar MS, Asada HH, Saif MTA, Bashir R. (2014). Three-Dimensionally Printed Biological Machines Powered by Skeletal Muscle. *PNAS*, 111(128), 10125-10130.
- Raman R, Cvetkovic C, Uzel SGM, Platt, RJ, Sengupta P, Kamm RD, Bashir R. (2016). Optogenetic Skeletal Muscle-Powered Adaptive Biological Machines. *PNAS*, 113(113), 3497-3502.
- Melhem M, Park J, Knapp L, Reinkensmeyer L, Cvetkovic C, Flewellyn J, Lee M, Jensen T, Bashir R, Kong H, Schook L. (2016). 3D printed stem cell-laden, microchanneled hydrogel patch for the enhanced release of cell-secreting factors and treatment of myocardial infarctions. *ACS Biomaterials Science & Engineering*.
- Raman R, Cvetkovic C, Bashir R. (2016). A Modular Approach to Design, Fabrication, and Characterization of Muscle-Powered Biological Machines. *Nature Protocols*. (In Press.)
- Cvetkovic C, Rich MH, Raman R, Kong H, Bashir R. (2016). A 3D Printed Platform for Modular Neuromuscular Motor Units. *Microsystems and Nanoengineering*. (In Press.)
- Raman R, Grant L, Seo Y, Cvetkovic C, Gapinske M, Palasz A, Dabbous H, Kong H, Perez Pinera P, Bashir R. (2016). Damage, Healing, and Remodeling in Optogenetic Skeletal Muscle Bioactuators. *Advanced Materials*. (Submitted.)
- Cvetkovic C*, Ferrall-Fairbanks MC*, Ko E, Grant L, Kong H, Platt MP, Bashir R. (2016). Investigating the Life Expectancy and Proteolytic Degradation of Engineered Skeletal Muscle Biological Machines. *Nature Communications*. (Submitted.)

SELECTED PRESENTATIONS

Poster Presentations

- Cvetkovic C, Raman R, Chan V, Williams BJ, Tolish M, Bajaj P, Sakar MS, Asada HH, Saif TA, Bashir R. "Control of Skeletal Muscle Bio-Actuators with Electrical Stimulation." American Society of Mechanical Engineers (ASME) 3rd Global Congress on NanoEngineering for Medicine and Biology (NEMB), San Francisco, CA, February 2014.
- Cvetkovic C, Swetenburg R, Rich MH, Kong H, Stice SL, Bashir R. "Innervation of 3D Printed Biological Machines." IEEE Engineering in Medicine & Biology Society's Micro and Nanotechnology in Medicine (EMBS-MNM) Conference, Oahu, HI, December 2014.

Oral Presentations

- Cvetkovic C, Chan V, Raman R, Bashir R. "Development of a 3-D Skeletal Muscle Biological Actuator." Biomedical Engineering Society (BMES) Annual Meeting, Seattle, WA, September 2013. *Top Abstract and Presentation*.
- Cvetkovic C, Raman R, Rich MH, Swetenburg R, Williams BJ, Stice SL, Kong H, Saif MTA, Bashir R. "3D Printed Biological Machines Powered by Skeletal Muscle." BMES Annual Meeting, San Antonio, TX, October 2014.
- Cvetkovic C, Rich MH, Kong H, Bashir R. "3D Printed Neuromuscular Biological Machines." 4th Tissue Engineering & Regenerative Medicine International Society (TERMIS) World Congress, Boston, MA, September 2015. *Invited*.
- C. Cvetkovic, C. Wilder, M. Ferrall, R. Raman, M. Platt, and R. Bashir. "Optimizing the Performance and Lifetime of Muscle-Powered Biological Machines." BMES Annual Meeting, Tampa, FL, October 2015.
- C. Cvetkovic. "Biological Building Blocks for 3D Printed Cellular Systems." UMN Department of Biomedical Engineering Graduate Student Colloquium, University of Minnesota, Minneapolis, MN, April 2016. *Invited*.
- C. Cvetkovic, M. Ferrall-Fairbanks, R. Raman, M. Platt, and R. Bashir. "Forward Engineering the Functionality of 3D Printed Skeletal Muscle-Powered Biological Machines." BMES Annual Meeting, Minneapolis, MN, October 2016.
- Cvetkovic C*, Raman R*, Bashir R. "Engineered Living Systems: A New Frontier for Biomedical Microdevices." IEEE EMBS-MNM, Hawaii, HI, December 2016.