

**PROMOTION RECOMMENDATION  
UNIVERSITY OF MICHIGAN MEDICAL SCHOOL  
DEPARTMENT OF INTERNAL MEDICINE**

Carol Danvers, PhD, Research Professor of Biomedical Engineering, and Research Associate Professor, Institute of Gerontology, is recommended for promotion to Research Professor, Institute of Gerontology effective September 1, 2019.

**Academic Degrees**

1992	PhD, University of California, Davis; Davis, California
1989	MS, University of California, Davis; Davis California
1985	BS, University of California, Davis; Davis, California

**Professional Record**

2018-present	Professor, Biomedical Engineering Department, School of Engineering, University of Michigan, Ann Arbor, MI.
2010-present	Research Associate Professor, Institute of Gerontology, University of Michigan, Ann Arbor, MI.
2010-2018	Associate Professor, Biomedical Engineering Department, School of Engineering, University of Michigan, Ann Arbor, MI.
2008-2010	Research Associate Professor, Molecular and Integrative Physiology, University of Michigan, Ann Arbor, MI.
2008-2010	Associate Research Scientist, Department of Biomedical Engineering, University of Michigan, Ann Arbor, MI.
2004-2006	Research Assistant Professor, Institute of Gerontology, University of Michigan, Ann Arbor, MI.
2003-2008	Assistant Research Scientist, Department of Biomedical Engineering, School of Engineering, University of Michigan, Ann Arbor, MI.
2002-2004	Assistant Research Scientist, Institute of Gerontology, University of Michigan, Ann Arbor, MI.
1996-2002	Assistant Research Scientist, Department of Internal Medicine, Geriatrics Medicine, University of Michigan, Ann Arbor, MI.

**Summary of Evaluation**

**Research:**

Dr. Danvers's research focuses on regenerative medicine, specifically in the field of musculoskeletal tissue engineering. Dr. Danvers has been highly productive since her last promotion. She has been successful with obtaining funding for her work through NIH grants as well as foundation grants. Her current funding includes several NIH grants as well as one from the Department of the Army. Dr. Danvers has an excellent list of publications that includes 65 peer-reviewed publications, with 14 of these coming in the past two years alone. Additionally, since 2015 she has co-authored two book chapters. Of particular note, her work in tissue engineering is highly translational and has resulted in four patents. Dr. Danvers maintains membership in five professional societies, including the Biomedical Engineering Society. Evidence of her stature in the field of tissue regeneration is noted by the numerous national and international extramural invited presentations Dr. Danvers has been asked to give. In 2015 she was the symposium speaker at TERMIS (Tissue Engineering and Regenerative Medicine International Society) World Congress in Boston.

### Recent and Significant Publications

VanDusen KW, Syverud BC, Williams ML, Jonah Lee JD and **Danvers, LM**. Engineered Skeletal Muscle Units for Repair of Volumetric Muscle Loss in the Tibialis Anterior Muscle of a Rat. *Tissue Engineering, Part A*. 2014, 20(21): 2920-2930.

Mahalingam V, Smietana MJ, Olsen TJ, Wojtys EM, Wellik DM, Arruda EM and **Danvers, LM**. Allogenic vs. Autologous Derived Cell Sources for Use in Engineered Bone-Ligament-Bone for Sheep ACL Repair. *Tissue Engineering Part A*. 2015 Mar;21(5-6):1047-54.

Mahalingam V, Smietana MJ, Olsen TJ, Wojtys EM, Wellik DM, Arruda EM and **Danvers, LM**. Fresh vs Frozen Allogenic Derived Cell Sources for Use in Engineered Bone-Ligament-Bone for Sheep ACL Repair. *Tissue Engineering Part C. Methods*. 2015 Jun;21(6):548-56.

Florida SE, VanDusen KW, Mahalingam VD, Schlientz AJ, Wojtys EM, Wellik DM, **Danvers LM**. In Vivo structural and cellular remodeling of engineered bone-ligament-bone constructs used for anteriorcruciate ligament reconstruction in sheep. *Connect Tissue Res*. 2016 Nov;57(6):526-538.

Novakova SS, Mahalingam VD, Florida SE, Mendias CL, Allen A, Arruda EM, Bedi, A and **Danvers LM**. Tissue Engineered Tendon Constructs for Rotator Cuff Repair in Sheep. *Journal of Orthopaedic Research* 2017 Jun; DOI: 10.1002/jor.23642

### Teaching:

Teaching is a fundamental activity of Dr. Danvers's service to the University of Michigan and her record is nothing short of impressive. She has been involved in teaching at the Dental School and Medical School for both undergraduate and graduate school students. Dr. Danvers is involved in Ann Arbor's Community Resource Program. This program allows high school students to obtain credit by doing research in labs at the University of Michigan. To date she has provided mentorship to 14 high school students, each of these students went on to four year colleges with eight of them matriculated into the University of Michigan. For the past 17 years, Dr. Danvers has also been involved with the Undergraduate Research Opportunity Program (UROP). Many of those who have been under her mentorship in this program have stayed on throughout their tenure at the University of Michigan. She provides the encouragement and mentorship needed for them to both publish their research and present it at national scientific meetings. In addition to this, Dr. Danvers has been a strong mentor for trainees in the lab. While mentoring those in her lab, her focus is on muscle, tendon and ligament tissue engineering. Her breadth of teaching covers high school to graduate and postgraduate students. Dr.

Danvers has mentored 52 undergraduate research students; 22 master's students; 12 Ph.D. program students, 4 MD and 5 postdoctoral researchers and 1 clinical fellow. No matter what level of student she is working with, Dr. Danvers wants to teach all to be critical, independent thinkers. Dr. Danvers has also provided her services to those seeking their Ph.D. Since 2010, she has served on six dissertation committees in the Department of Biomedical Engineering.

### Service:

Dr. Danvers is an important contributor to the research community at large. She currently serves as a reviewer for the *Journal of Regenerative Medicine* as well as an ad-hoc reviewer for quite a number of other journals including the *Journal of Orthopaedic Research*, *Tissue Engineering and Regenerative Medicine* and in 2016, *PLoS One*. Since 2013 Dr. Danvers has served as a reviewing editor for the following publications: *American Journal of Tissue Engineering*, *Frontiers in Physiology* and *Journal of Regenerative Medicine*. Furthermore, she has extensive experience as an ad hoc reviewer for numerous organizations and study sections, including the NIH NIAMS Institute, NIH NRSA fellowship and the Medical Research Council, United Kingdom. Starting in 2016 and continuing through 2019, Dr. Danvers serves as the Chair of the Knee Topic Committee for the Orthopaedic Research Society's Program Committee. Institutionally, Dr. Danvers also serves on the organization, steering and executive committees for several university and departmental programs.

## **External Reviews:**

Reviewer A: "... In addition, my level of respect for Dr. Danvers's body of work and scientific accomplishments is further reflected by my invitation for her to submit an article to a Special Topics Issue of *Cells, Tissues and Organs*, which I edited, and was published in 2016. The entire double issue of the journal was devoted to skeletal muscle tissue engineering and regenerative medicine technologies and approaches. The goal for that issue was to solicit contributions from the most well known and respected leaders in the field so we could put together a compendium of manuscripts that would not only define the field, but also, point to the future of the field. Dr. Danvers's scientific contributions put her solidly in that category of leaders, and she was among my first invites."

Reviewer B: "In terms of research output she has excellent research outputs spanning her whole research career, but in particular I wish to highlight her 2014 Tissue Engineering: Part A paper which details a novel method using tissue-engineered skeletal muscle units to repair muscular defects. Their method demonstrated survival of implanted units, their vascularization and innervation, and formation and maintenance of a skeletal muscle phenotype. This study has profound implications for development of tissue engineered solutions for skeletal muscle repair."

Reviewer C: "Her mentoring and supervision not only promoted diversity and equal opportunity by supporting women and under-represented groups in science, but also resulted in collaborative projects..... In addition to her stellar contributions to the fields of tissue engineering and regenerative therapy, Dr. Danvers is a clear and enthusiastic communicator of science – a trait that is as rare as it is important. Her talent and passion for scientific communication, collaboration, and camaraderie is evident from her publication record, and teaching, lecturing, and mentoring activities."

Reviewer D: "The productive research projects conducted in Dr. Danvers's laboratory on muscle-tendon integration, ligament tissue engineering and skeletal muscle regeneration are supported by an impressive, decade-long track record of continuous funding from the National Institutes of Health (two R01s as PI, 2 R01 as Co-I), DoD as well as private foundations. She is currently the Principal Investigator of several NIH-funded projects, including a new R01 on engineering skeletal muscle units (~\$2.5M in total costs). This is particularly outstanding given the current funding climate and historically low pay-lines at the NIH."

Reviewer E: "Her level of funding is excellent...As her work has become more translational, her research funding has increased. She has 4 patents, 2 applications pending. She is co-Founder of STEL Technologies to develop engineered tissue replacement for torn knee ligaments. The company received SBIR and STTR funding. There is a steady progression in her work from basic, to more translational, making her one of the few working in musculoskeletal tissue engineering whose work spans this broad range."

## **Career Development Plan (Research Investigator, Assistant Research Scientist, Research Assistant Professor):**

Example Career Development plans can be found here: [Department User Drop Box folder](#)

## **Summary of Recommendation:**

In summary, Dr. Danvers is a highly valuable, collaborative and productive member of departments in the medical school and college of engineering. Her record of research accomplishments serve as an example for others to follow and her outstanding contributions to teaching and service to the school and community at large are invaluable. Therefore, Dr. Carol Danvers is recommended for promotion to Research Professor, Institute of Gerontology, effective September 1, 2019.

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Marschall S. Runge, M.D., Ph.D.  
Executive Vice President for Medical Affairs  
Dean of the Medical School  
University of Michigan