Approved by the Regents
May 19, 2016

PROMOTION RECOMMENDATION
THE UNIVERSITY OF MICHIGAN
MEDICAL SCHOOL
DEPARTMENT OF MOLECULAR AND INTEGRATIVE PHYSIOLOGY

Lisa M. Larkin, Ph.D., associate professor of molecular and integrative physiology, without tenure, Department of Molecular and Integrative Physiology, Medical School, is recommended for the granting of tenure to be held with her title of associate professor of molecular and integrative physiology, Department of Molecular and Integrative Physiology, Medical School [also associate professor of biomedical engineering, without tenure, Department of Biomedical Engineering, Medical School and College of Engineering].

Academic Degrees:

Ph.D.	1992	University of California, Davis
M.S.	1989	University of California, Davis
B.S.	1985	University of California, Davis

Professional Record:

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

Summary of Evaluation:

Teaching: Teaching is a particular strength for Dr. Larkin and her record is impressive. She has been involved in teaching of undergraduate and graduate school students at the School of Dentistry and Medical School. In addition to numerous didactic classes, she has been a strong mentor for trainees in the lab. The breadth of her teaching covers high school to graduate and post-graduate students. Dr. Larkin has mentored 14 high school students, 34 UROP students, three Physiology Research Training students; three engineering summer research training students; 21 undergraduate independent research projects; 19 master's students; 14 Ph.D. program students, five M.D. and four post-doctoral students.

Research: Dr. Larkin has been highly productive since her last promotion. Her current funding includes an R56 bridge grant which enabled her to generate preliminary data to successfully compete and renew her NIH R01. In addition, she received an NIH R41 SSTR grant and has a third research proposal

submitted to the Department of the Army which is awaiting review. She serves as a co-PI on an NSF project and is the recipient of the MTRAC Kickstart Award.

Dr. Larkin has an excellent list of publications that includes 49 peer-reviewed publications, 16 of these in the past five years, with additional six manuscripts under review. Of particular note, her work in tissue engineering is highly translational and has resulted in two patents with an additional three intellectual property applications on record. Notably, Dr. Larkin received the 2012 Excellence in Research Award from the American Orthopaedic Society for Sports Medicine, and she maintains membership in six professional societies, including the Biomedical Engineering Society.

As an authority in the field of tissue engineering, Dr. Larkin has become a popular speaker at meetings, both nationally and internationally. She has presented her work at 19 meetings, 12 of which have been in the last five years. She provided the keynote lecture for the Tissue and Cell Engineering Society of the United Kingdom at their 2012 meeting and has also presented in China and at prominent national/international meetings in the United States.

Recent and Significant Publications:

Adams AM, Arruda EM, Larkin LM: Use of adipose-derived stem cells to fabricate scaffoldless tissue-engineered neural Conduits in vitro. *Neuroscience* 201:349-356, 2012.

Williams ML, Kostrominova TK, Arruda EM, Larkin LM: Effect of implantation on engineered skeletal muscle-tendon constructs. *J Tissue Eng Regen Med* 7:434-442, 2013.

VanDusen KW, Syverud BC, Williams ML, Lee JD, Larkin LM: Engineered skeletal muscle units for repair of volumetric muscle loss in the tibialis anterior muscle of a rat. *Tissue Engineering, Part A*, 20: 2920-2930, 2014.

Mahalingam-V, Smietana MJ, Olsen TJ, Wojtys EM, Wellik DM, Arruda EM, Larkin LM: Allogenic vs. autologous derived cell sources for use in engineered bone-ligament-bone for sheep ACL repair. *Tissue Engineering Part A*, 21:1047-1054, 2015.

Mahalingam-V, Smietana MJ, Olsen TJ, Wojtys EM, Wellik DM, Arruda EM, Larkin LM: Fresh vs. frozen allogenic derived cell sources for use in engineered bone-ligament-bone for sheep ACL repair. *Tissue Engineering Part C. Methods*, 21:548-556, 2015.

Service: Dr. Larkin currently serves as an ad hoc reviewer for seven journals and is on the editorial board of three journals (*American Journal of Tissue Engineering, Frontiers in Physiology, Journal of Regenerative Medicine*). 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. She has served on the organization, steering and executive committees for University and departmental programs. Therefore, Dr. Larkin is an important contributor to the research community at large.

External Reviewers:

Reviewer A: "...although the field of skeletal muscle tissue engineering and regenerative medicine is still relatively small, it is growing rapidly, and Dr. Larkin has been part of this effort from the very beginning....she is among the leaders in her field of research."

Reviewer B: "She is one of the international leading researchers in musculoskeletal tissue engineering particularly relating to musculo-tendinous and ligament related tissue engineering. I would rate her studies and findings as world leading and in the leading rank of her peers."

Reviewer C: "...I have been impressed not only with Dr. Larkin's cell-based tissue engineering achievements in the lab (which are noteworthy), but with her ability to tackle the technical and logistical hurdles associated with translating these findings to pre-clinical models, with a true eye on clinical translation. To me, this is quite rare in the tissue engineering arena, as progressive cell-based research typically stays in the lab, and translation is often reserved to more conservative, acellular approaches....Her work is at the leading edge of the field, and I am excited to see where it goes from here."

Reviewer D: "She is one of the few researchers to consider ways to integrate engineered muscle tendon and bone. Dr. Larkin's research in skeletal muscle tissue engineering has focused upon integrating the engineered muscle with neurons and tendon. She was one of the first to develop a neuromuscular junction in vitro and that formation of this junction in vitro facilitates innervation of muscle after implantation."

Reviewer E: "...Dr. Larkin is an innovative researcher, dedicated educator and mentor working actively in a highly significant and challenging research area. She has demonstrated in abundance her ability to build an independent and productive research program, given both the high number of publications and extended funding track record. Most importantly, Dr. Larkin's work stands out due to its inherent creativity and current as well as future impact in orthopaedic tissue regeneration. Dr. Larkin is certainly a recognized leader in cell-based approaches to skeletal tissue regeneration, and I eagerly anticipate the growth and future discoveries to be generated through her innovative and productive research program."

Summary of Recommendation:

Dr. Larkin is a highly valued, collaborative and productive member of the faculty in the Medical School and College of Engineering. Her record of research accomplishments serves 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, I am pleased to recommend Lisa M. Larkin, Ph.D. for the granting of tenure to be held with her title of associate professor of molecular and integrative physiology, Department of Molecular and Integrative Physiology, Medical School.

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

David C. Munson, Jr.
Robert J. Vlasic Dean of Engineering
College of Engineering

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