Approved by the Regents
May 19, 2022

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

Thomas H. Sanderson, Ph.D., associate professor of emergency medicine, without tenure, Department of Emergency Medicine, is recommended for the granting of tenure to be held with his title of associate professor of emergency medicine, Department of Emergency Medicine, Medical School [also associate professor of molecular and integrative physiology, without tenure].

Academic Degrees:

Ph.D.	2006	Wayne State University
B.S.	2001	Western Michigan University

Professional Record:

2017 - Present	Associate Professor of Emergency Medicine, without tenure, University of Michigan
2017 - Present	Associate Professor of Molecular and Integrative Physiology, without tenure, University of Michigan
2015 - 2017	Associate Professor of Medicine, with tenure, Wayne State University School
2012 - 2015	Associate Professor, without tenure, Wayne State University
2009 - 2012	Assistant Professor, Wayne State University

Summary of Evaluation:

Teaching: Dr. Sanderson is a dedicated teacher. He instructs didactically and in the laboratory. He has mentored 16 graduate students, three of whom have graduated to post-doctoral fellowships and/or faculty positions, eight medical students, four post-doctoral fellows and 15 undergraduate students. Dr. Sanderson has served on five dissertation committees and three master's committees. He is a member of the Neuroscience Graduate Program Preliminary Examination Committee. His classroom instruction includes lectures in Responsible Conduct in Research (PIBS 570), Faculty Mentored Graduate Student Seminar Series (NS700), and Molecular Biology of Mitochondria in Disease (NBG8770).

Research: Dr. Sanderson's research is focused on developing neuroprotective interventions for cardiac arrest patients. His long-term goal is to develop a therapeutic approach to neuronal damage and reduce morbidity and mortality in patients with brain ischemia or trauma. He has excellent funding currently as the principal investigator of an NIH R01 grant, an American Heart Association grant, a National Institute of Neurological Disorders and Stroke grant and several foundation grants. Dr. Sanderson has published 34 peer-reviewed articles, holds four patents, and has been invited to present his research regionally and nationally. With Dr. Mark Huttemann, he founded Mitovation, Inc. in 2016; a privately held, development-stage medical device company addressing ischemia/reperfusion injuries and associated conditions with a proprietary, non-invasive, mitochondria modulating system.

Recent and Significant Publications:

Anzell AR, Fogo GM, Gurm Z, Raghunayakula S, Wider JM, Maheras KJ, Emaus KJ, Bryson TD, Wang M, Neumar RW, Przyklenk K, Sanderson TH: Mitochondrial fission and mitophagy are independent mechanisms regarding ischemia/reperfusion injury in primary neurons. *Cell Death and Disease*. 2021. (2021)12:475 https://doi.org/10.1038/s41419-021-03752-2

Fogo GM, Anzell AR, Maheras KJ, Raghunayakula S, Wider JM, Emaus KJ, Bryson TD, Bukowski MJ, Neumar RW, Przyklenk K, Sanderson TH.: Machine learning-based classification of mitochondrial morphology in primary neurons and brain. *Sci Rep* 11(1): 5133, 2021.PM33664336

Strubakos CD, Malik M, Wider JM, Lee I, Reynolds CA, Mitsias P, Przyklenk K, Hüttemann M, Sanderson TH: Non-invasive treatment with near-infrared light: A novel mechanisms-based strategy that evokes sustained reduction in brain injury after stroke. *J Cereb Blood Flow Metab* 40(4): 833-844, 2020. PM31112450/PMC7168789

Zhou Z, Torres M, Sha H, Halbrook CJ, Van den Bergh F, Reinert RB, Yamada T, Wang S, Luo Y, Hunter AH, Wang C, Sanderson TH, Liu M, Taylor A, Sesaki H, Lyssiotis CA, Wu J, Kersten S, Beard DA, Qi L: Endoplasmic reticulum-associated degradation regulates mitochondrial dynamics in brown adipocytes. *Science* 368(6486): 54-60, 2020. PM32193362

Sanderson TH, Wider JM, Lee I, Reynolds CA, Liu J, Lepore B, Tousignant R, Bukowski MJ, Johnston H, Fite A, Raghunayakula S, Kamholz J, Grossman LI, Przyklenk K, Hüttemann M: Inhibitory modulation of cytochrome c oxidase activity with specific near-infrared light wavelengths attenuates brain ischemia/reperfusion injury. *Sci Rep* 8(1): 3481, 2018. PM29472564/PMC5823933

External Reviewers:

Reviewer A: "His research in understanding the cell death mechanisms in the brain has made a valuable/unparalleled impact, and has provided a deep insight into the mechanisms of neural cell death and mitochondrial dysfunction. In my opinion, Dr. Sanderson is an exceptional scientist in this area of research, and his future and current contribution will have a significant impact on the therapeutics of stroke and other diseases involving acute neuronal injury…This exceptional record of accomplishment of funding plus outstanding research contribution through valuable publication and novel discoveries in the area of neuronal cell death and mitochondrial dysfunction in acute neuronal injury is a remarkable demonstration of Dr. Sanderson's excellence in the area of research."

Reviewer B: "Dr. Sanderson has a highly focused and novel research program. For many years he has had an interest in mitochondrial function after ischemic injury. This research has resulted in several patents. His focus has served him well; he has 34 publications in the field…The novelty of his work does make Dr. Sanderson stand out. He is working in a small field and is developing into one of its leaders."

Reviewer C: "Tom's work in the field of mitochondria and neuroprotection is truly outstanding, innovative and highly clinically translational…[He is] definitely in the top 10 of labs exploring mitchondrial mechanisms of neurologic impairment and neuroprotection, particularly following

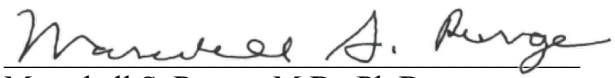
stroke and cardiac arrest…In summary, Dr. Sanderson is an outstanding scientist whose most important discoveries are yet to come. I highly recommend that he be awarded tenure."

Reviewer D: "Dr. Sanderson's findings regarding disturbances in mitochondrial integrity following global cerebral ischemia has moved the field forward. A distinguishing feature of Dr. Sanderson's research program has been his collaborative spirit, which has led to great advancements in his research and increased funding opportunities…Dr. Sanderson has strong funding from the NIH, Department of Defense and American Heart Association. His history of funding, coupled with his record of innovation and collaboration provide strong evidence that Dr. Sanderson will likely continue to run a productive and funded research endeavor at the University of Michigan for many years to come."

Reviewer E: "I am particularly impressed by his abilities to use interdisciplinary approaches and adapt methodologies within his research field. Dr. Sanderson's publications have impacted how ischemia within the brain is viewed, and will likely help to change treatment strategies…In addition to his research endeavors, Dr. Sanderson has devoted considerable time and effort towards teaching and mentoring, which are of significant note…Finally, Dr. Sanderson has demonstrated excellence in innovation and entrepreneurship with his exciting research discoveries and commercialization efforts. His novel research has led to 4 discoveries patented by the US patent office. These discoveries have led to the formation of a startup company, Mitovation, Inc. where Dr. Sanderson serves as Co-Founder and Chief Scientific Officer."

Service: Dr. Sanderson has strong service on institutional and national committees. Nationally, has served on study sections for the NIH, as the chair of two American Heart Association committees, and a Department of Defense committee. He is an ad hoc reviewer for 17 journals and is the associate editor for *Life Sciences*. Dr. Sanderson is the founder and medical advisory board member for Mitovation, Inc., and institutionally, serves on the Strategically Focused Research Network Oversight Committee.

Summary of Recommendation:
Dr. Sanderson is an innovative and dedicated researcher and educator. He has made novel discoveries in the field of mitochondrial mechanisms of neurologic impairment and protection, and is clearly on an upward trajectory. I am pleased to recommend Thomas H. Sanderson, Ph.D. for promotion to associate professor of emergency medicine, with tenure, Department of Emergency Medicine, Medical School.



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

May 2022