

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

Geoffrey G. Murphy, Ph.D., associate professor of molecular and integrative physiology, with tenure, Department of Molecular and Integrative Physiology, Medical School, is recommended for promotion to professor of molecular and integrative physiology, with tenure, Department of Molecular and Integrative Physiology, Medical School [also being promoted to research professor, Molecular and Behavioral Neuroscience Institute].

Academic Degrees:

Ph.D.	1998	University of California at Los Angeles
B.A.	1990	University of California Berkley

Professional Record:

2010-present	Associate Professor of Molecular and Integrative Physiology, University of Michigan
2010-present	Research Associate Professor, Molecular and Behavioral Neuroscience Institute, University of Michigan
2003-2010	Research Assistant Professor, Molecular and Behavioral Neuroscience Institute, University of Michigan
2003-2010	Assistant Professor of Molecular and Integrative Physiology, University of Michigan
2003-2003	Assistant Research Scientist, Molecular and Behavioral Neuroscience Institute, University of Michigan

Summary of Evaluation:

Teaching: Dr. Murphy has mentored three Ph.D. students, two master's students and one post-doctoral fellow. He is currently mentoring one staff scientist, one clinical lecturer and two post-doctoral fellows. He has trained more than 35 undergraduate researchers since joining the University of Michigan. Currently, he also supervises in his laboratory two technical staff members and has three students and one post-master's student. For the past 10 years, Dr. Murphy has served as the course director for the introductory neuroscience class and has taught in a variety of graduate level courses in Molecular and Integrative Physiology (MIP) and the Neuroscience Graduate Program. In 2012, he developed a new course on integrative physiology for the MIP master's students, and he remains the course director for this class. He also lectures in the Unit for Laboratory Animal Medicine (ULAM) and Department of Neurology resident training programs.

Research: Dr. Murphy is considered an international expert in the areas of learning induced neural plasticity and voltage-gated ion channels, and their role in the neurobiology of age-related cognitive aging. His laboratory recently generated a new line of transgenic mice that mimics key aspects associated with age-related cognitive decline. Dr. Murphy's research portfolio has also recently expanded as his lab has become heavily involved in more translational work targeting both neurological and psychiatric disorders. He is currently collaborating with investigators in the Department of Cell and Developmental Biology and the Department of Psychiatry as part of a multi-

site NIH U19 award to study genetic polymorphisms in patients with bipolar maladies. As part of the Protein Disease Folding Initiative at the Medical School, his laboratory is investigating the impact of altering metabolic function in mouse models of Alzheimer's disease.

#### Recent and Significant Publications:

Gamelli AE, McKinney BC, White JA, Murphy GG: Deletion of the L-type calcium channel Ca(V) 1.3 but not Ca(V) 1.2 results in a diminished sAHP in mouse CA1 pyramidal neurons. *Hippocampus* 21:133-141, 2011.

Perkowski JJ, Murphy GG: Deletion of the mouse homolog of KCNAB2, a gene linked to monosomy 1p36, results in associative memory impairments and amygdala hyperexcitability. *J Neurosci* 31:46-54, 2011.

Temme SJ, Bell RZ, Pahumi R, Murphy GG: Comparison of inbred mouse substrains reveals segregation of maladaptive fear phenotypes. *Front Behav Neurosci* 8:282, 2014.

Althaus AL, Sagher O, Parent JM, Murphy GG: Intrinsic neurophysiological properties of hilar ectopic and normotopic dentate granule cells in human temporal lobe epilepsy and a rat model. *J Neurophysiol* 113:1184-1194, 2015.

Krueger JN, Moore SJ, Parent R, McKinney BC, Lee A, Murphy GG: A novel mouse model of the aged brain: Over-expression of the L-type voltage-gated calcium channel CaV1.3. *Behavioural Brain Research* 2016 in press.

Service: At the national level, Dr. Murphy serves as a reviewing editor for *Frontiers in Behavioral Neuroscience* and is a contributing editor for *Epilepsy Currents*. He serves as a reviewer for several scientific journals in the fields of neuroscience, cellular aging, memory and ion channel function. He has served on multiple study sections for the NIH and is currently empaneled on their learning and memory fellowship study section. In addition, he has been a regular reviewer for the Alzheimer Association for many years. At the institutional level, Dr. Murphy has served on numerous committees. He is currently a member of the Rackham Graduate School Integrity Board, and a member of the Global Engagement of Graduate Education. He has been a past chair of the Neuroscience Graduate Program Curriculum Committee and past chair of the Medical School's Advisory Committee on Primary Research Appointments, Promotions and Titles. Dr. Murphy is currently one of the co-directors in the Protein Folding Disease Initiative.

#### External Reviewers:

Reviewer A: "There are no other molecular and behavioral neuroscientists who have had the skill and forbearance to mount the type of study that Geoff has done of the L-type calcium channel subtypes in mice. His success on this series of studies bodes well for the future. The newly funded R01 grant that Dr. Murphy has received from the National Institute on Aging will support his efforts to continue this important series of studies through 2021... His colleagues at the University of Michigan are clearly benefiting from his expertise in their own research projects."

Reviewer B: "I have been very impressed with his work on neuronal excitability mechanisms underlying learning and memory. In particular, I find of great importance his recent work on the potassium channel subunit K $\beta$ 2. Modulation of neuronal excitability is very important for learning

and memory, but unfortunately it is understudied in the learning and memory field.... Geoff is an international leader in this important sub-field... I think that Geoff's work is truly pioneering and that it is highly regarded in the excitability sub-field of learning and memory research."

Reviewer C: "It is obvious that Dr. Murphy has a high quality research program and has made significant research contributions to his field, one of the criteria required for promotion to Professor. Dr. Murphy also has been able to obtain and maintain extramural funding for his research, fulfilling another requirement for promotion to Professor. His research is truly unique in that he is one of the only neuroscientist that is making genetically engineered mouse models of aging that can be studied and analyzed without having to age the animals, which often carries prohibitive costs... I have met several of his laboratory trainees at scientific meetings, and have found them well prepared and excited about their work, which suggests that Dr. Murphy is an excellent mentor of graduate students and postdoctoral fellows."

Reviewer D: "Dr. Murphy is an authority in the field of mouse genetics, with emphasis on rodent models of Alzheimer's disease and aging, and his work is currently contributing much to our understanding of the murine neurobiology of aging. It seems clear from multiple lines of evidence that Dr. Murphy has achieved national and international recognition in the field."

Reviewer E: "Geoff has bravely tackled complex questions of brain function and plasticity during learning and memory, and during aging, through the use of mouse models, mainly developed in his own laboratory. This is a laborious, expensive and challenging way to address this research question, but one that is likely to allow for the greatest insights into the *in vivo* situation... This has led to a body of work that is widely recognized as both already having a significant impact on the field, but that hold [sic] great potential for continued achievement. Geoff's research is the epitome of the modern interdisciplinary approach to science."

Summary of Recommendation:

Dr. Murphy's scholarly contributions as a researcher, his service to the department and institution, and his contributions in teaching make him deserving of promotion. I am pleased to recommend Geoffrey G. Murphy, Ph.D. for promotion to professor of molecular and integrative physiology, with tenure, Department of Molecular and Integrative Physiology, Medical School.



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

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