Approved by the Regents
May 20, 2010

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

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

Academic Degrees:

Ph.D.	1998	University of California, Los Angeles
B.A.	1990	University of California, Berkeley

Professional Record:

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

Summary of Evaluation:

Teaching: Dr. Murphy has excelled in all facets related to education including classroom and laboratory teaching, chairing and participating in student dissertations and committee meetings. He is co-director of Neuroscience 704, the Neural Plasticity Workshop (journal club) that is held each fall. He is also one of three instructors for Neuroscience 623, the Introduction to Research in Cellular and Molecular Neurobiology course (two weeks in duration) that is taught each year for incoming neuroscience students. He has lectured in Physiology 502 (Human Physiology-introductory graduate level class for non-physiology grad students and advanced undergraduates), Physiology 555 (Integrative Genomics for PIBS graduate students) and Neuroscience 612 (Neurochemistry). In addition to didactic teaching, Dr. Murphy has given generously of his time in terms of participation in 20 preliminary examination committees. He is also actively sought after as a member of Ph.D. thesis committees and has served on 20 such committees, two as chair. In addition, a previous research technician completed her M.S. degree from Eastern Michigan University while in his laboratory. He has housed two postdoctoral fellows, one of whom has completed her fellowship and has gone on to a faculty appointment in a research institution.

Research: Since arriving at the University of Michigan in 2003, Dr. Murphy has built a national and international reputation in the learning and memory field. His work examines the role of L-type, voltage-gated Ca^{2+}, Na^{+}, and K+ ion channels with a focus on age related decline. He has

uniquely built his research program on gene deletion in mice, coupled with systematic analysis at the electrophysiological and behavioral levels. His findings include information about various phases of memory and the role of specific proteins in its consolidation. His work has importance to both the basic and translational research arenas on why and how does cognition fail as we age, and are there molecular targets that can be used to prevent this decline? In addition, he is a collaborator with Jack Parent, M.D., professor of neurology, on an active research program on altered circuit dynamics in the hippocampus during epilepsy. His growing scholarly stature is supported by 20 original peer-reviewed manuscripts and two review articles. He holds an editorial position on the *Frontiers in Behavioral Neuroscience* journal, and has been a recurrent reviewer for many highly regarded publications. He has also served as an ad hoc reviewer for the National Institute on Aging and has been highly successful in securing national research support as a PI, including NIH R01 (2008-2013) and R21 grants and as a collaborator and co-investigator on two additional R01 grants, as well as a PI on a prestigious National Alliance for Research on Schizophrenia and Depression (NARSAD) grant.

Recent and Significant Publications:

McKinney BC, Sze W, Lee B, Murphy GG: Impaired long-term potentiation and enhanced neuronal excitability in the amygdala of $Ca_v1.3$ knockout mice. *Neurobiology of Learning and Memory* 92(4):519-528, 2009.

White JA, McKinney BC, John MC, Powers PA, Kamp TJ, Murphy GG: Conditional forebrain deletion of the L-type calcium channel $Ca_v1.2$ disrupts remote spatial memories in mice. *Learning & Memory* 15(1):1-5, 2008. (Selected for cover).

McKinney BC, Chow CY, Meisler MH, Murphy GG: Exaggerated emotional behavior in mice heterozygous for the sodium channel *Scn8a* ($Na_v1.6$). *Genes, Brain & Behavior*. 7(6):629-638, 2008.

McKinney BC, White JA, Sze W, Murphy GG: L-type voltage gated calcium channels in conditioned fear: a genetic and pharmacological analysis. *Learning & Memory* 15(5):326-334, 2008.

McKinney BC, Murphy GG: The L-type voltage-gated calcium channel $Ca_v1.3$ mediates consolidation, but not extinction, of contextually-conditioned fear in mice. *Learning & Memory* 13(5):584-589, 2006.

Service: Dr. Murphy has an outstanding record of service at the University of Michigan. This includes his contributions in the Molecular and Behavioral Neuroscience Institute and in the Department of Molecular and Integrative Physiology as a member of the MBNI/Molecular and Integrative Physiology faculty Search Committee (2004-2006). At the School level, Dr. Murphy is currently a member of APRAPT (Advisory Committee on Primary Research Appointments, Promotions, and Titles), and has served on or continues his membership in the Michigan Comprehensive Diabetes Center, the Neuroscience Program Executive Committee, as well as on

the steering committees of Biology of Aging and Neuroscience Training Grant. Dr. Murphy was previously a councilor for the Michigan Chapter for the Society for Neuroscience.

External Review:

Reviewer A: "The success that Dr. Geoff Murphy has had in generating peer-reviewed grants to support his work is impressive, especially in these very difficult times for grant funding. He has received both an R-21 and, more recently, a 5-year R01 grant from the NIA to support his work on L-type calcium channels…I know from my interactions with the program staff at the National Institute on Aging that they are very enthusiastic about the approach that Geoff is taking in his work. His colleagues in the peer review community obviously share this enthusiasm."

Reviewer B: "A major strength of his research is the ability to combine genetic mouse mutants with behavioral characterization and electrophysiological analysis. This permits detailed evaluation of hypothesized mechanisms and the role of specific proteins in behavior. His research has focused on ion channels, particularly, Ca^{2+} channels and their role in memory. His work not only addresses basic mechanisms, he has made important contributions to our understanding of the relationship between cell excitability and memory function during aging, an important and timely research area."

Reviewer C: "…Dr. Murphy and his colleagues found that Nav1.6 mutant mice have exaggerated emotional behavior. These studies have direct relevance for human disease because people with mutations in the gene for this channel have a wide spectrum of neurological deficits…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 has consistently employed cutting edge multidisciplinary approaches and he is gaining increasing recognition for his sophisticated neurobiological research. Notably, his expertise with genetically engineered mice has enabled his lab to perform novel tests of hypotheses on fear conditioning and brain aging."

Reviewer E: "His teaching activities are substantial and diverse, with extensive involvement in graduate teaching in Neuroscience and Physiology, as well as regular involvement in the Neurology Neuroscience Conference. He has trained a number of graduate students and postdoctoral fellows, and served on a huge number of PhD thesis and qualifying exam committees for other students. Geoff has also performed a high level of service, as evidenced by being honored with a faculty service award in 2006…Together, these achievements show that Geoff has clearly mastered the juggling act of research, teaching and service required to be a faculty member at a first-rate research institution such as Michigan. He is operating at a high level in all of these areas, and his record suggests that his trajectory is upwards."

Reviewer F: "To cut to the chase, his record of research accomplishments, funding, publications, teaching and service appear substantially above threshold for promotion; indeed, his promotion file is one of the strongest that I've reviewed in recent years…Dr. Murphy is a tremendous asset to your university and I support his promotion wholeheartedly."

Summary of Recommendation:

Dr. Geoffrey Murphy is an outstanding candidate for promotion. He is an excellent teacher and is on the appropriate trajectory in terms of his scholarly productivity and ability to secure national research grant support. He has become a nationally and internationally recognized investigator in the field of learning and memory for which he has been able to develop novel approaches for the study of cognitive decline with aging. I anticipate that he will continue to excel and grow his academic career at the University of Michigan, and to serve as a superb role model. I am, therefore, pleased to recommend Dr. Murphy for promotion to associate professor, with tenure, in the Department of Molecular and Integrative Physiology.

James O. Woolliscroft, M.D.
Dean
Lyle C. Roll Professor of Medicine

May 2010