Approved by the Regents May 15, 2014

PROMOTION RECOMMENDATION
UNIVERSITY OF MICHIGAN
MEDICAL SCHOOL
DEPARTMENT OF CELL AND DEVELOPMENTAL BIOLOGY
DEPARTMENT OF NEUROLOGY

Roman J. Giger, Ph.D., associate professor of cell and developmental biology, with tenure, Department of Cell and Developmental Biology, and associate professor of neurology, without tenure, Department of Neurology, Medical School, is recommended for promotion to professor of cell and developmental biology, with tenure, Department of Cell and Developmental Biology, and professor of neurology, without tenure, Department of Neurology, Medical School.

Academic Degrees:

Ph.D.	1995	University of Zurich, Switzerland
M.S.	1991	University of Zurich, Switzerland
B.S.	1990	University of Zurich, Switzerland

Professional Record:

2008-present	Associate Professor of Cell and Developmental Biology, University of Michigan
2008-present	Associate Professor of Neurology, University of Michigan
2006-2008	Associate Professor of Biomedical Genetics, Center for Neural Development and Disorder, University of Rochester School of Medicine and Dentistry, Rochester
2001-2006	Assistant Professor of Neurology, Center for Aging and Developmental Biology, University of Rochester School of Medicine and Dentistry, Rochester

Summary of Evaluation:

Teaching: Dr. Giger is heavily invested in classroom and laboratory teaching, and serves on a number of dissertation committees. He is both a lecturer and laboratory instructor in the M1 Medical Histology course, where he supervises eleven histology laboratory sections. Dr. Giger also lectures to students in the Dental Histology course and to graduate students. He lectures on neuroplasticity and axon pathfinding in Developmental Biology, CDB580, and for the last five years has delivered 4-6 hours of lectures per year on the mechanisms of axonal pathfinding and degeneration and regeneration in the Neuroscience course, NSC700. Moreover he has organized a Neuroscience journal club that is focused on neurodevelopment. In addition to Dr. Giger's classroom instruction, he is very involved in teaching in his laboratory providing one-on-one training to post-doctoral fellows, graduate and undergraduate students, as well as to research technicians. Over the past twelve years, he has trained eight Ph.D. students and seven post-doctoral fellows. He currently has four graduate students, two post-doctoral research fellows, and two undergraduate students performing research in his laboratory. Dr. Giger has served and/or continues to serve on 32 graduate dissertation committees (including four students

currently in his laboratory). In addition, he has served on 28 Ph.D. candidacy examination committees, eleven of these at the University of Michigan.

Research: The overall goal of Dr. Giger's research is to determine the molecular and cellular mechanisms that regulate neural plasticity and repair of the nervous system. Dr. Giger has made a series of original and critical findings in this area. For example, he recently made the striking discovery that a class of macromolecules, which inhibit regeneration in the central nervous system following damage, have a second independent and critical role in the normal CNS. He showed that these inhibitors and their receptors are enriched in synapses, where they regulate synapse structure, and synaptic strength. In an independent study he showed that Fig4, which modulates the signaling lipid, PtdIns (3, 5) P2, is critical for myelination. Further analysis led him to the unexpected discovery that Fig4 expression in the axon is critical for formation of the myelin sheath, a process carried out by non-neuronal cells. These findings provided critical evidence that demonstrates that there is extensive cross regulation between neurons and glia. These findings are highly significant and of great importance in the field of neurobiology, particularly in understanding and promoting regeneration. Dr. Giger's studies have been published in the most prestigious journals in the field, including: *Nature Neuroscience*, *Neuron* and *The Journal of Neuroscience*. In recognition of his important work, Dr. Giger has been continuously funded since 2002, and currently holds one NIH, two VA and a Dana Foundation grant, as well as funding from the prestigious Adelson Medical Research Foundation.

Recent and Significant Publications:

Lee H, Raiker SJ, Venkatesh K, Zhang Y, Lee H, Venkatesh K, Shrager P, Yeh H, Giger RJ: Synaptic function for the Nogo-66 Receptor NgR1: Regulation of dendritic spine morphology and activity-dependent synaptic strength. *J. Neurosci.* 28:2753-2765, 2008.

Raiker SJ, Lee H, Baldwin KT, Duan Y, Shrager P, Giger RJ: Oligodendrocyte-Myelin Glycoprotein and Nogo negatively regulate activity-dependent synaptic plasticity. *J Neurosci* 30:12432-12445, 2010.

Winters JJ, Ferguson CJ, Lenk GM, Giger-Mateeva VI, Shrager P, Meisler MM, Giger RJ: Congenital CNS hypomyelination and reduced number of mature oligodendrocytes in mice null for the phosphatidylinositol phosphatase *Fig4*. *J of Neurosci* 31:17736-17751, 2011. (Featured as a This Week in the Journal article).

Matsuoka RL, Chivatakarn O, Badea TC, Samuels IS, Cahill H, Katayama K, Kumar SR, Suto F, Chédotal A, Peachey NS, Nathans J, Yoshida Y, Giger RJ*, Kolodkin AL*: Class 5 transmembrane semaphorins control selective mammalian retinal lamination and function. *Neuron* 71:460-473, 2011. *co-corresponding authors

Dickendesher TL, Baldwin KT, Mironova YA, Koriyama Y, Raiker SJ, Askew KL, Wood A, Geoffroy CG, Zheng B, Liepmann CD, Katagiri Y, Benowitz LI, Geller HM, Giger RJ: NgR1 and NgR3 are receptors for chondroitin sulfate proteoglycans. *Nature Neurosci* 15:703-712, 2012.

Service: Dr. Giger is extensively involved in departmental service, as well as service to the Neuroscience Graduate Program. He is also an active member of the Cell and Molecular Biology Graduate Program (CMB), and an active member of the Center for Organogenesis. In his capacity as a member of the Neuroscience Program, since 2011 he has served as a standing member of the Preliminary Exam committee. In addition, he has served on the admissions committee for the CMB program. Dr. Giger has served as an ad hoc reviewer for grant review study sections for the National Science Foundation, Veterans Affairs and for New York State Stem Cell Science (NYSTEM). He is an associate editor for the *Journal of Neuroscience*, a very highly regarded journal. He also serves as a reviewer for several top journals including *Nature, Nature Medicine, Neuron, Science, Proceedings of the National Academy of Sciences, Science Signaling and The Journal of Cell Biology.*

External Reviewers:

Reviewer A: "He has emerged as one of the foremost international experts on the functions on Nogo receptors and has done truly pioneering work elucidating unexpected roles for these receptors at synapses....Overall Dr. Giger is a keenly intelligent and creative scientist who knows how to do experiments that move quickly to the heart of crucial questions. He is rigorous and careful and when he publishes something, he gets it right."

Reviewer B: "Overall, Roman has shown a very original and strategic vision in regeneration research, and most of his papers are landmarks of some sort. He has clearly shown an ability to continue to produce excellent research... I believe that Roman is emerging as one of the rather small number of international leaders in neural regeneration research."

Reviewer C: "Dr. Giger is an outstanding investigator, who is one of the leading figures in the field of axon-glia communication and myelin inhibitors. He definitely deserves this promotion....Dr. Giger is an outstanding lecturer and his scientific presentations are always a delight. They are of the kinds that keep you thinking about the interesting problems he discussed long after the lecture is over. He is extremely well funded, and is frequently being invited to talk at scientific meetings, two parameters that likely reflect his originality and innovation."

Reviewer D: "He is highly regarded in the field because of his innovative approaches to tackle these complex biological problems but also because his findings are highly reliable and often define new directions for the field....Roman is a true opinion leader and he is often regarded among the most successful investigators of his generation in this field."

Reviewer E: "Dr. Giger is known and recognized both nationally and internationally.... Dr. Giger is a regular reviewer for numerous journals and a regular reviewer for several private and national funding agencies."

Summary of Recommendation:

Dr. Giger has achieved a consistent record of extraordinary scholarship and funding since coming to Michigan. His extensive contributions to our current understanding of the mechanisms that regulate neural plasticity and repair in the nervous system, especially his

discoveries of the extensive cross talk between neurons and glia, are widely acknowledged. He is a superb teacher and mentor. Dr. Giger has consistently assumed many administrative responsibilities within the university, serving on numerous committees in the Department of Cell and Developmental Biology, as well as in other programs. I am pleased to recommend Roman J. Giger, Ph.D. for promotion to professor of cell and developmental biology, with tenure, Department of Cell and Developmental Biology, and professor of neurology, without tenure, Department of Neurology, Medical School.

J. O. Woolliscroft

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

May 2014