

PROMOTION RECOMMENDATION
UNIVERSITY OF MICHIGAN
MEDICAL SCHOOL
DEPARTMENT OF PHARMACOLOGY

Approved by the Regents
May 14, 2009

Jeffrey R. Martens, Ph.D., assistant professor of pharmacology, is recommended for promotion to associate professor of pharmacology, with tenure, Department of Pharmacology, Medical School.

Academic Degrees:

Ph.D.	1998	University of Florida
B.Sc.	1993	University of Florida

Professional Record:

2004-present	Assistant Professor of Pharmacology, University of Michigan
2001 – 2004	Assistant Professor of Physiology and Pharmacology, Oregon Health Sciences University

Summary of Evaluation:

Teaching: Dr. Martens is a very effective and engaging teacher and has participated in a number of department courses and Medical School courses such as Cardiovascular Pharmacology 612, Pharmacology 502, Pharmacology 660, and CMB 850. He was a facilitator for the senior elective Medical School course “Clinical Pharmacology and Therapeutics,” and he created and designed Pharmacology 570: History of Pharmacology. He interacts very easily with students and faculty, and his lectures are described as very well prepared and generally outstanding. Specifically, Dr. Martens has earned high marks in terms of his organization; his ability to make the material interesting; his enhancing student understanding; the provision of useful handouts; and the respect and professional behavior he exhibits to students. While Dr. Martens has proved to be a superior educator in the courses and activities he has taught and helped organize, he has also excelled in graduate student mentoring of pre- and postdoctoral fellows. He has supervised and mentored three postdoctoral fellows, four Ph.D. candidates, and seven undergraduate students. His students have been highly productive, with numerous publications in high quality journals. In addition, Dr. Martens has served on nine Ph.D. thesis committees and several preliminary examination committees. He also is director of the Department of Pharmacology graduate recruiting and participates as a member on five different federally funded training programs.

Research: Dr. Martens is an outstanding scientist who has successfully established his own independent research program by making very original and insightful contributions to the understanding of lipid rafts, voltage-dependent potassium channels, Kv1.5 channels of the heart, and ion channel SUMOylation. With his expertise in electrophysiology and molecular imaging methods, he has developed novel approaches and strategies to further our understanding of ion channels and other proteins. During his years at the University of Michigan, Dr. Martens’

primary research focus has been to identify and understand the mechanisms regulating ion channel expression, trafficking, and localization, including the identification of a number of regulatory pathways in the voltage-gated Kv1.5 channel. More recently, his work has focused on the targeting of olfactory proteins in olfaction. He was the first scientist to demonstrate that targeting of the cyclic nucleotide-gated transduction channel to olfactory cilia requires the presence of both the CNGB1b accessory subunit and a kinesin-2 family member, Kif17. He also discovered that a genetic mutation in a ciliary transport protein, CEP290, causes olfactory dysfunction in both mouse and humans. Both his previous work and his current research have many implications that could lead to the treatment of various diseases such as arrhythmias in the heart, diabetes in the pancreas, epilepsy in the brain, and retinal degeneration. Dr. Martens has 31 publications in high quality, peer-reviewed journals such as the *Journal of Biological Chemistry*, *Circulation*, the *Journal of Molecular and Cellular Cardiology*, the *Journal of Pharmacological and Experimental Therapeutics*, *Molecular Pharmacology*, the *American Journal of Physiology*, and the *Proceedings of the National Academy of Sciences*.

Dr. Martens continues to be invited to present his work at a number of scientific meetings, including the 2008 Molecular Function of Ion Channels Symposia in Copenhagen, the 2008 Biophysical Society Meeting in Long Beach, and the 2007 Association for Chemoreception Sciences Annual Meeting. His work on olfactory signaling proteins and voltage-gated K channels has led to invitations to present his research at numerous peer institutions and a number of them have actively recruited him. Dr. Martens' research has also been recognized by his success in obtaining research grants. He currently has an R01 from the NIDCD and another from NIMH, and serves as a co-investigator on four additional R01's. He previously held an R01 from NHLB and a Scientist Development Grant with the National American Heart Association.

Recent and Significant Publications:

McEwen DP, Koenekoop RK, Khanna H, Jenkins PM, Lopez I, Swaroop A, Martens JR: Hypomorphic CEP290/NPHP6 mutations result in anosmia caused by the selective loss of G proteins in cilia of olfactory sensory neurons. *PNAS* 104:15917-15922, 2007.

Benson MD, Li Q-J, Kieckhafer K, Dudek D, Whorton MR, Sunahara RK, Iñiguez-Lluhi JA, Martens JR: SUMO modification regulates inactivation of the voltage-gated potassium channel Kv1.5. *PNAS* 104:1805-1810, 2007.

McEwen DP, Schumacher SM, Li Q, Benson MD, Iñiguez-Lluhi JA, Van Genderen KM, Martens JR: Rab-GTPase-dependent endocytic recycling of Kv1.5 in atrial myocytes. *J Biol Chem* 282: 29612-29620, 2007.

Zhang L, Foster K, Li Q, Martens JR: S-acylation regulates Kv1.5 channel surface expression. *Am J Physiol Cell Physiol* 293:152-161, 2007.

Jenkins PM, Hurd TW, Zhang L, McEwen DP, Brown RL, Margolis B, Verhey KJ, Martens JR: Ciliary targeting of olfactory CNG channels requires the CNGB1b subunit and the kinesin-2 motor protein, KIF17. *Current Biology* 16:1211-1216, 2006.

Service: Dr. Martens has contributed significantly in the area of departmental service. In addition to numerous thesis committees, he has served on the departmental Seminar Committee, the Graduate Program Committee, the Graduate Student Recruitment Committee, the departmental Faculty Recruitment Committee, the School of Dentistry Faculty Search Committee, the Medical School's BMRC Council, and the University's Scientific Single Molecule Steering Committee. He has also contributed to student and postdoctoral scholar activities, including the departmental retreat and participated in the Pharmacology summer fellowship programs.

Dr. Martens has served as an *ad hoc* reviewer for several national and international journals, including *Nature Protocols*, the *Journal of Cardiovascular Pharmacology*, the *Journal of Cellular Physiology*, the *Journal of Neurophysiology*, and the *British Journal of Pharmacology*. He has served as an *ad hoc* reviewer on the Cardiovascular Division Program Committee of the American Society of Pharmacology and Experimental Therapeutics (ASPET), the Abstract Review Committee of the National American Heart Association, Human Frontiers of Science Grants, and the British Biotechnology and Biological Sciences Research Council. Dr. Martens has also achieved substantial national and international recognition as evidenced by his invitation to participate at the 2008 Molecular Function of Ion Channels Symposia in Copenhagen, the 2008 Biophysical Society Meeting in Long Beach, and the 2007 Association for Chemoreception Sciences Annual Meeting, where he was awarded the Polak Young Investigator Award.

External Review:

Reviewer A: "...if we had an open position, he would be the first person I would recruit to our Neuroscience Program. Jeff is a 'rising star' who has all the tools of intelligence, creativity and perseverance to make a major impact with his scientific work. He is also a natural leader and his strong interpersonal skills will further speed his already rapid ascent as an established, internationally recognized and respected scientist."

Reviewer B: "Dr. Martens' research has undergone a remarkable evolution from his initial observations of Kv channel down regulation in hypertension and targeting of Kv channels in lipid rafts to novel paradigms of Kv channel modulation. This work has then expanded from the cardiovascular to olfactory system, with splendid success. This is a testimony to his perseverance and creativity."

Reviewer C: "JRM is one of the most inspiring scientists [of his cohort] within his field. He has an impressive publication list showing a number of first-class papers being referenced significantly by other scientists."

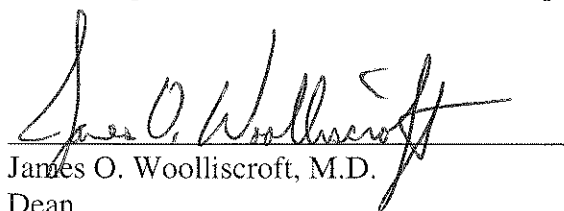
Reviewer D: "The University of Michigan attracts students with great potential but Jeff has elevated his students to a higher level by mentoring and scientific rigor....I expect that he will continue to be productive and a leader in the field of sensory transduction for many years to come."

Reviewer E: "...you have recruited a creative and energetic scientist of the highest caliber. Of course you should promote him, and if you don't, there will be any number of highly-ranked universities waiting in line to snap him up."

Reviewer F: "...Dr. Jeffrey Martens has established a national reputation as an expert in potassium channel regulation and trafficking and is an emerging star in the field of the molecular aspects of olfaction. His research is highly original and has obvious clinical significance. He has been successful in obtaining extramural funding for his research and has a strong publication record....Dr. Martens would be a highly sought after colleague in any Pharmacology or Physiology department in the country..."

Summary of Recommendation:

Dr. Martens is a recognized expert in signal transduction and receptor mechanisms who has made significant contributions to the understanding of ion channel function and targeting. He has emerged as a leader in the areas of ion channel SUMOylation, Kv channels of the heart, and now olfactory cilia. He is recognized for his talents in biochemistry, electrophysiology, molecular biology, cell biology and pharmacology, and for developing innovative approaches to his research. He has also shown a commitment to teaching and has made valuable service contributions to the teaching of graduate students, undergraduate students, and postdoctoral fellows in the laboratory. Dr. Martens will, without a doubt, continue to be successful in all research, teaching, and service activities, and I enthusiastically support his promotion to associate professor, with tenure, in the Department of Pharmacology.



James O. Woolliscroft, M.D.

Dean

Lyle C. Roll Professor of Medicine

May 2009