

PROMOTION RECOMMENDATION
UNIVERSITY OF MICHIGAN MEDICAL SCHOOL
DEPARTMENT OF PHARMACOLOGY

Roger K. Sunahara Ph.D., Assistant Professor of Pharmacology, Department of Pharmacology, Medical School, is recommended for promotion to Associate Professor of Pharmacology, with tenure, Department of Pharmacology, Medical School.

Academic Degrees:

Ph.D.	1993	University of Toronto
B.Sc.	1988	University of Toronto

Professional Record:

2001-Present	Assistant Professor of Pharmacology, University of Michigan
1998-2001	Assistant Professor (Research), Department of Pharmacology, University of Texas Southwestern Medical Center

Summary of Evaluation:

Teaching: Dr. Sunahara has been invited and has given numerous lectures in his field of interest. He has been involved in teaching Pharmacology 646, Pharmacology 660, CMB 530, and is Course Co-Director in Pharmacology 619. His lectures are described by faculty, postdocs and students as outstanding, being both insightful and well prepared. Dr. Sunahara is recognized as an excellent communicator who is both energetic and interactive with peers and students alike. He has also shown a commitment to teaching and made many valuable service contributions to the teaching of graduate students and postdoctoral fellows in the laboratory and joint research group sessions. More recently, Dr. Sunahara has also agreed to participate in the new Pharmacology Structural Biology course.

Research: Dr. Sunahara is a nationally recognized expert in signal transduction mechanisms who has made significant contributions to the structural elucidation of the interaction between G proteins and G protein-coupled receptors (GPCRs). He has emerged as a leader in the field and has made seminal contributions to our understanding of the structure/function of GPCRs. He is recognized for his talents in biochemistry, DNA technology, molecular biology, protein engineering, protein structure, protein crystallography and pharmacology, and uses these skills to make new and challenging discoveries. Dr. Sunahara's primary focus has been on working toward the determination of the atomic structure of a unique conformation of the β -adrenergic receptor. Elucidation of the receptor structure and delineation of the process of G protein activation will be a major breakthrough in signal transduction. He discovered the value of using HDL particles to study GPCRs, and his group is applying this technology to quantify the signaling activities of unambiguously defined β -adrenergic receptors and rhodopsin monomers. In one significant scientific achievement over the last few years, Dr. Sunahara provided evidence that a single GPCR molecule is sufficient to activate a G-protein. The eventual resolution of

multiple binding sites introduces the potential for structure-based drug design and an ever-growing methodology for developing more selective and potent therapeutic compounds.

Dr. Sunahara is an outstanding scientist who has established his own independent research program. He is well organized, always ready with insightful ideas, and is very capable of working independently, or as a member of a research team as evidenced by his numerous collaborations. Since his appointment in the Department of Pharmacology, he has had 24 publications in high quality, peer-reviewed journals such as *Biochemistry*, the *Journal of Biological Chemistry*, *Science*, *Neuroscience*, the *American Journal of Physiology*, *Proceedings of the National Academy of Sciences*, and *Molecular Pharmacology*. He has also contributed chapters to three highly regarded books over the past few years. His work on G protein signaling and adenylyl cyclase action has led to national invitations to present his research, and other peer institutions have actively recruited him. Dr. Sunahara's research has been recognized by his success in obtaining assorted extramural funding from NIH and various corporations.

Recent and Significant Publications:

Whorton MR, Jastrzebska B, Park PS-H, Fotiadis D, Engel A, Palczewski K, Sunahara RK: Efficient coupling of transducin to monomeric rhodopsin in a phospholipids bilayer. *J Biol Chem* Nov. 22, 2007 (epub ahead of print).

Vadakkadathmeethal K, Cunliffe JM, Swift J, Kennedy RT, Neubig RR, Sunahara RK: Fluorescence-Based adenylyl cyclase assay adaptable to high throughput screening. *Combinatorial Chemistry & High Throughput Screening* 10:289-298, 2007 (journal cover).

Whorton MR, Bokoch MP, Rasmussen SGF, Huang B, Zare RN, Kobilka B, Sunhara RK: A monomeric G protein-coupled receptor isolated in a high-density lipoprotein particle efficiently activates its G protein. *Proceeding of the National Academy of Sciences* 104:7682-7687, 2007.

Vadakkadathmeethal K, Felczak A, Davignon I, Collins J, Sunahara RK: Cloning and characterization of the G protein $\beta\gamma$ subunits from *Trichoplusia ni* (High FiveTM cells). *Ins Biochemistry and Molecular Biology* 35:333-345, 2004.

Klein C, Heyduk T, Sunahara RK: Zinc inhibition of adenylyl cyclase correlates with conformational changes in the enzyme. *Cellular Signalling* 16:1177-1185, 2004.

Service: Dr. Sunahara actively participates throughout the University on numerous committees, conferences, and research partnerships. He currently serves on the University's Macromolecular Structure Initiative Committee, the Single Molecule Spectroscopy Steering Committee, and the Protein Structure, Design and Dynamics Committee. He has coordinated graduate admissions both for the Chemical Biology Program and the Department of Pharmacology. Within the Department, he has also chaired and served on numerous thesis and prelim committees, the Department of Pharmacology Advisory Committee, Awards Committee, and Seminar Committee. A major departmental service that he provides has been the organization of the University of Michigan Single Molecule Symposium in 2006 and the Great Lakes GPCR Retreats in 2002 and 2006. These events have been highly successful and have provided further evidence of Dr. Sunahara's organizational skills and overall commitment. Dr. Sunahara also has

a very good national and international visibility. He has served as an *ad hoc* reviewer for many top tier scientific journals (*Biochemistry, Molecular Pharmacology, Journal of Biological Chemistry, Journal of Cell Biology, Journal of Neurochemistry, Journal of Neuroscience, EMBO Journal, and Proceedings of the National Academy of Sciences*). He also has served as an *ad hoc* reviewer for several NIH Study Sections, including NIGMS and NIDDK and also for CIHR (Canadian Institute of Health Research). He has received 14 invitations to speak at national/international symposia since his appointment in 2002 (including the Gordon Research Conferences on Molecular Pharmacology in January 2007, the Gordon Research Conferences on Phosphorylation & G-protein Coupled Receptor in June 2007, and has been invited to speak at the Gordon Research Conferences on Ligand Recognition and Molecular Gating in March 2008).

External Review:

Reviewer A: “Roger is a true leader and pioneer in the field of signal transduction with expertise in the areas of GPCRs, G-proteins and effectors.”

Reviewer B: “...I consider Roger to be a very bright and energetic scientist who has made major contributions to our understanding of the molecular mechanisms of GPCR signaling. Additionally, I regard him as one of the most technologically-savvy investigators in this field.”

Reviewer C: “...Roger is poised to be an important player to reshape our view of GPCR signaling for the years to come.”

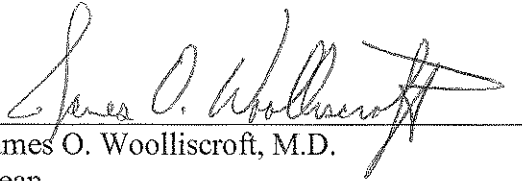
Reviewer D: “Dr. Sunahara has firmly established a laboratory in Ann Arbor that already has made seminal contributions to our understanding of the structure/function of G protein-coupled receptors (GPCR)...It is very clear that Roger Sunahara is one of the top half dozen investigators of his generation in the GPCR/heterotrimeric G protein signaling field...Dr. Sunahara has developed a first-rate independent research program that pursues front of the field questions with ambitious goals. I have no doubt that he will continue to flourish in his studies... and he will expand his research program into exciting new areas....Roger Sunahara is a natural leader who will enormously help the science of other independent investigators with whom he interacts.”

Reviewer E: “From the number of collaborative publications he has with a number of excellent scientists, it's clear that Roger is highly interactive and is an excellent colleague. His interests are broad, and he knows and tackles difficult and important problems. He has participated appropriately in teaching and service activities. He is clearly an asset and a delightful and enthusiastic departmental citizen.”

Reviewer F: “I can say at the outset, that I have always been impressed with the originality and rigor of Dr. Sunahara's work, and offer my highest level of enthusiasm in supporting his candidacy for promotion and tenure at Michigan...I would enjoy such an interactive and idea-provoking scientist as a research and teaching colleague, assuming that his contagious enthusiasm and rigor of his thinking apparent at national meetings is also manifest in his daily scientific life at Michigan.”

Summary of Recommendation:

Dr. Sunahara has established a productive, high quality research program that is attracting substantial extramural support and numerous intra and inter-departmental collaborations, and he has developed a significant national and international visibility. He is an important resource for the training of undergraduate, graduate and postdoctoral students and is held in very high esteem by his colleagues and students. Given the momentum of his research program, there is every indication that he will continue to prosper. Without reservation, I enthusiastically support Dr. Sunahara's promotion to Associate Professor, with tenure, in the Department of Pharmacology.

A handwritten signature in cursive script, reading "James O. Woolliscroft". The signature is written in black ink and is positioned above a horizontal line.

James O. Woolliscroft, M.D.

Dean

Lyle C. Roll Professor of Medicine

May 2008