Approved by the Regents
May 15, 2008

PROMOTION RECOMMENDATION
UNIVERSITY OF MICHIGAN MEDICAL SCHOOL
DEPARTMENT OF HUMAN GENETICS
DEPARTMENT OF INTERNAL MEDICINE

John V. Moran, Ph.D., Associate Professor of Human Genetics, with tenure, Department of Human Genetics, and Associate Professor of Internal Medicine, without tenure, Department of Internal Medicine, Medical School, is recommended for promotion to Professor of Human Genetics, with tenure, Department of Human Genetics, and Professor of Internal Medicine, without tenure, Department of Internal Medicine, Medical School.

Academic Degrees:

Ph.D.	1994	University of Texas Southwestern Medical Center
M.S.	1990	The Ohio State University
B.S.	1986	Rochester Institute of Technology

Professional Record:

2003-Present	Associate Professor of Human Genetics and Associate Professor of Internal Medicine, University of Michigan
1998-2003	Assistant Professor of Human Genetics and Assistant Professor of Internal Medicine, University of Michigan

Summary of Evaluation:

Teaching: Dr. Moran carries a full teaching load in the Department of Human Genetics, and is highly sought after for guest lectures in a variety of courses. He has presented seven lectures in HG541, a molecular genetics course that is one of three primary graduate courses offered to all doctoral students in the graduate Program in Biomedical Sciences. Although this course is taken by approximately 100 students with very diverse backgrounds in genetics and biological sciences, Dr. Moran's lectures have been uniformly well-received and his enthusiastic, invigorating style of teaching has been recognized by students. "He loves to teach, and it shows," summarizes well his didactic teaching. Dr. Moran also delivers three lectures in HG542, principles of human genetics, and has served as a lecturer and laboratory instructor in the postdoctoral training course for MDs transitioning to basic research. He has received rave reviews for this exercise as well. Finally, Dr. Moran has taken the Genetics Training Grant Seminar (HG631), once a sleepy requirement for students supported on this training grant, and turned it into an exciting and important learning exercise. Directing sixteen one-hour seminar sessions focused on the topics of the yearly genetics short course supported by the Genetics Training Grant, he provides detailed feedback to students in writing and orally, on both subject matter and presentation. In addition to his didactic teaching, Dr. Moran has trained doctoral students in his laboratory who have gone to outstanding laboratories for their postdoctoral training, and two of his postdoctoral fellows have obtained faculty positions. Dr. Moran is

highly sought after as a mentor for Ph.D. thesis committees as well as mentoring committees for junior faculty. He gives freely of his time in this capacity, contributing a great deal institutionally without expecting recognition for it. He does it because he is an outstanding colleague and is passionate about high quality science.

Research: Dr. Moran's research focuses on a class of human retrotransposons (jumping genes) named LINEs (long interspersed elements), or L1s. The majority of our genetic material has been thought to be "junk DNA," repetitive sequences of DNA that do not encode functional genes. L1s are an abundant class of repetitive DNA that comprises almost 20% of human genomic DNA. Far from being uninteresting junk, however, these sequences have played a major role in shaping the human genome over the course of evolution. Furthermore, active retrotransposition continues to occur, and L1 elements can be the cause of deleterious mutations resulting in genetic disorders. On the other hand, they also provide a mechanism for creating novel genes. Dr. Moran's research uses a variety of approaches to investigate the molecular mechanism of L1 transposition, the effect of retrotransposition on the human genome, and potential practical uses for engineered L1 elements.

Since becoming an Associate Professor, Dr. Moran has propelled the field forward with numerous discoveries published in top-tier journals. He demonstrated that LINE-1 can cause genomic instability, in addition to being a mutagen through retrotransposition events. He unraveled the molecular mechanism of LINE-1 reverse transcriptase using elegant biochemical approaches. In addition, he discovered an unexpected and unusual translational mechanism used by LINE-1 elements, which is likely utilized in the translation of endogenous mammalian genes. Finally, he collaborated with JoAnn Sekiguchi to demonstrate that LINE-1 retrotransposition near the telomeres relies on an ancient mechanism of RNA mediated DNA repair. It is clear that Dr. Moran is the leader in this rapidly growing field.

Recent and Significant Publications:

Morrish TA, Garcia Perez JL, Stamato TD, Taccioli GE, Sekiguchi J, and Moran JV: Endonuclease-independent LINE-1 retrotransposition at mammalian telomeres. *Nature* 446: 208-12, 2007.

Kulpa DA and Moran JV: *Cis*-preferential LINE-1 reverse transcriptase activity in ribonucleoprotein particles. *Nature Structural and Molecular Biology* 13: 655-60, 2006.

Alisch RS, Garcia-Perez JL, Muotri AR, Gage FH, and Moran JV: Unconventional translation of mammalian LINE-1 retrotransposons. *Genes and Development* 20: 210-24, 2006.

Gilbert N, Lutz S, Morrish TA, and Moran JV: Multiple fates for L1 retrotransposition intermediates in cultured human cells. *Molecular and Cellular Biology* 25: 7780-95, 2005.

Kulpa DA and Moran JV: Ribonucleoprotein particle formation is necessary but not sufficient for LINE-1 retrotransposition. *Human Molecular Genetics* 14: 3237-48, 2005.

Service: Dr. Moran served as co-director of the Genetics Training Grant, which is an important educational and funding mechanism for students in several different science departments. He was the driving force behind the submission of the competing renewal application, and he has agreed to become the director after the renewal is funded. In addition to his role as a mentor for new assistant professors in Human Genetics, Cell and Developmental Biology, Molecular Medicine and Genetics (Division of Internal Medicine), he makes himself available to faculty recruiting activities in numerous departments and programs. He has been an invaluable contributor to the Department of Human Genetics faculty searches and many Biological Science Scholar searches. Dr. Moran is a highly interactive and outstanding colleague, whose informal impact on his colleagues' research is very important. In fact, his impact on colleagues throughout the University is reflected in his receipt of the Dean's Basic Science Award, the Russel Award, and numerous external awards. He was a member of the first group of Biological Sciences Scholars Program (BSSP) recruits, and his success sets a high standard for those who follow him.

External Review:

Reviewer A: "The Cell paper in 1996 is really a marvelous one, opening a totally new perspective in our retroposon field....With this Cell paper and other following many wonderful papers, he opened a new field of science, namely a molecular mechanism of retroposition."

Reviewer B: "He is well respected in the field and is a star among his cohort of peers in the mobile DNA field....There is no question that John deserves this promotion and that he would achieve this at my own institution, and at others on a par with the University of Michigan."

Reviewer C: "...John has become one of the leading scientists in the field of transposable elements today. I can think of no one that has been more productive, or whose experiments have had greater impact over the past 5-10 years....John has proven himself to be an outstanding scientist, and clearly one of the leaders of his field. I see a continuing dominant role ahead for John."

Reviewer D: "I would consider John's lab in the top 3 worldwide and probably at the top of those focused on the mechanism of retrotransposition."

Reviewer E: "Very few labs have confronted the problem of understanding LINE-1 retrotransposition at the biochemical level. Moran's lab is one of these and perhaps the most inventive and bold."

Reviewer F: "Dr. Moran's contributions have immeasurably benefited the field of L1 biology. The results produced from his laboratory and those stemming from his numerous collaborations account for a very substantial portion of what we now know about the biochemical and molecular biological features of mammalian L1 replication. This knowledge and the experimental wherewithal that he and his collaborators have developed has inspired other molecular biologists and biochemists to enter the field..."

Reviewer G: "I can say that his research presentations are outstanding, and so are those of his students and post-docs, at national meetings....It is quite clear that he is exceptional at training students and post-docs through careful mentoring."

Summary of Recommendation:

Dr. Moran was the first faculty member recruited by the Biological Sciences Scholars Program, which has brought a number of very talented, outstanding early career academics to the University of Michigan; he is clearly a star within this elite group. John Moran is an outstanding scientist, teacher, and colleague. His intellectual breadth, enthusiasm, experimental acumen, and ability to excite and inspire students, postdoctoral fellows, and faculty colleagues, make him exceptional. I enthusiastically support his promotion to Professor, with tenure, in the Department of Human Genetics, and Professor, without tenure, in the Department of Internal Medicine.

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

May 2008