PROMOTION RECOMMENDATION
UNIVERSITY OF MICHIGAN MEDICAL SCHOOL
DEPARTMENT OF RADIOLOGY

Douglas C. Noll, Ph.D., Associate Professor of Radiology, without tenure, Department of Radiology, Medical School, is recommended for promotion to Professor of Radiology, without tenure, Department of Radiology, Medical School. [He also holds an appointment as Professor of Biomedical Engineering, with tenure, Department of Biomedical Engineering, College of Engineering.]

Academic Degrees:

Ph.D.	1991	Stanford University
M.S.	1986	Stanford University
B.S.	1985	Bucknell University

Professional Record:

2005-Present	Professor of Biomedical Engineering, University of Michigan
1999-Present	Associate Professor of Radiology, University of Michigan
1998-2005	Associate Professor of Biomedical Engineering, University of Michigan
1997-1998	Associate Professor of Radiology, University of Pittsburgh
1992-1997	Assistant Professor of Electrical Engineering, University of Pittsburgh
1991-1997	Assistant Professor of Radiology, University of Pittsburgh

Summary of Evaluation:

Teaching: Dr. Noll's primary teaching activity is in the College of Engineering where he has made valuable contributions in the creation of the biomedical engineering undergraduate degree program. Dr. Noll also provides significant teaching for the Department of Radiology. This primarily includes radiology residents and fellows interested in the medical applications of magnetic resonance (MR). Dr. Noll is an experienced participant in the 3T functional magnetic resonance imaging (MRI) laboratory where he works with radiology residents and fellows interested in learning more about functional MR, especially MR instrumentation. On a national level, he is highly regarded as a teacher. External reviewers comment on the quality of his presentations and his excellent communication skills.

Dr. Noll initiated a new course in the Department of Biomedical Engineering, Bio-signals and Systems (BME 311). This was a new "foundation" course for one of the curricular tracks within biomedical engineering. Along with Dr. Jezzard of Oxford University, Dr. Noll created a two day educational course for the International Society of Magnetic Resonance in Medicine (ISMRM). This was one of the best attended courses in the entire ISMRM program. Dr. Noll was one of four faculty who created a two week summer course in functional magnetic resonance imaging. The course has been very successful and has been repeated three more times.

Research: Dr. Noll's research is focused on the development of technology related to functional magnetic resonance imaging. Specific contributions arising from his work include the development of a new selective excitation method to correct through-plane dephasing in the T2-weighted acquisitions commonly used for functional MR imaging. By using a novel reconstruction method that simultaneously estimates the magnitude image of interest and the field map that can distort that image, motion artifact can be reduced. He was one of the first to document changes in the amplitude and shape of the hemodynamic response as a function in trains of stimuli of variable length. This may lead to a more accurate method of predicting and analyzing the functional MRI response to these kinds of tasks. His third major contribution has been extending the application domain of functional MRI. He and co-workers described an algorithm for establishing neural connections based on resting state spatiotemporal correlations. Self-organizing maps were used to establish patterns of interconnected regions without the necessity of specifying seed regions. He is now working with various physician scientists to develop practical applications of these observations.

Recent and Significant Publications:

Wager TD, Vazquez A, Hernandez-Garcia L, Noll DC: Accounting for nonlinear BOLD effects in fMRI: Parameter estimates and a model for prediction in rapid event-related studies. NeuroImage 25:206-218, 2005.

Sutton BP, Noll DC, Fessler JA: Dynamic field map estimation using a spiral-in/spiral-out acquisition. Magn Reson Med 51:1194-1204, 2004.

Peltier SJ, Polk TA, Noll DC: Detecting low-frequency functional connectivity fMRI using a self-organizing map (SOM) algorithm. Hum Brain Mapp 20:220-226, 2003.

Stenger VA, Boada FE, Noll DC: Three-dimensional tailored RF pulses for the reduction of susceptibility artifacts in T_2*-weighted functional MRI. Magn Reson Med 44:525-531, 2000.

Noll DC, Genovese CR, Nystrom LE, et al: Estimating test-retest reliability in functional MR imaging II: Application to motor and cognitive activation studies. Magn Reson Med 38:508-517, 1997.

Service: Dr. Noll's service activities include service to national professional organizations, service to the University of Michigan and service to the Department of Biomedical Engineering. Dr. Noll is especially active in the International Society of Magnetic Resonance in Imaging. This is the premiere scientific organization devoted to the medical uses of magnetic resonance for imaging and spectroscopy. He has served on a number of committees as well as the Board of Trustees. He has also served on two committees for national engineering societies. A prolific investigator, Dr. Noll has served as a journal referee for multiple professional peer-reviewed journals and currently serves on the editorial boards of two journals devoted to magnetic resonance.

External Review:

Reviewer A: "...Dr. Noll is clearly a mover in the field of fMRI....there is certainly plenty of evidence...that Dr. Noll continues to be a prominent and productive player in his field at the national and international level."

Reviewer B: "I think most would agree that Doug is one of the top 3 scientists around the world working at the cutting edge of development of MR technology and fMRI application."

Reviewer C: "In 13 years in faculty positions he has demonstrated the ability to perform sustained, significant, cutting edge research and to compete successfully for extramural grant support. He has developed fine teaching and mentoring skills. He is very highly regarded with the professional MRI community, as seen in his ISMRM leadership positions."

Reviewer D "Dr. Noll is also an outstanding teacher and educator....Dr. Noll is widely viewed as the main MR imaging scientist associated with Michigan and his continuing presence will be key to the future success of these activities."

Reviewer E: "There is no question that Dr. Noll has an international reputation and is well admired and indeed *liked* by his peers (this latter attribute cannot be said of all scientists!). For his international profile and scientific achievements he was rightly elected to the Board of Trustees of our premier scientific society."

Reviewer F: "Doug is an outstanding scientist with a reputation for doing high quality research, writing carefully articulated papers, and being generally collegial and very supportive of the scientific community. Doug has made a number of important contributions improving the artifact free nature of fMRI imaging and making it more quantitative and robust."

Summary of Recommendation:

The quality, innovation and breadth of Dr. Noll's research is outstanding. He has numerous peer-reviewed publications in the best of scientific journals and has obtained excellent grant support. External reviewers regard him as one of the best and brightest imaging scientists specializing in magnetic resonance. Dr. Noll works collaboratively with MR imaging scientists in the Department of Radiology. In addition to research, Dr. Noll provides teaching and mentoring to radiology residents and fellows interested in MR instrumentation. We are pleased to recommend Douglas C. Noll, Ph.D., for promotion to Professor of Radiology (without tenure) to be held in conjunction with his current title of Professor, with tenure, in the Department of Biomedical Engineering, College of Engineering.

Allen S. Lichter, M.D.
Dean, Medical School
Newman Family Professor
of Radiation Oncology

Ronald Gibala, Ph.D.
Interim Dean, College of Engineering
L.H. and F.E. Van Vlack Professor Emeritus
of Materials Science and Engineering

May 2006