

May 15, 2008

PROMOTION RECOMMENDATION
UNIVERSITY OF MICHIGAN MEDICAL SCHOOL
DEPARTMENT OF RADIATION ONCOLOGY

Yue Cao, Ph.D., is recommended for the granting of tenure to be held with her title of Associate Professor of Radiation Oncology, Department of Radiation Oncology, Medical School. [Also Associate Professor of Radiology, without tenure, in the Department of Radiology.]

Academic Degrees:

Ph.D.	1987	Ohio State University
M.S.	1985	Ohio State University
B.S.	1982	Peking University

Professional Record:

2003–Present	Associate Professor of Radiology, University of Michigan
2003–Present	Associate Professor of Radiation Oncology, University of Michigan
2003–Present	Research Associate Professor of Radiation Oncology, University of Michigan
1999–2003	Associate Professor of Radiology, Michigan State University
1994–1999	Assistant Professor of Medical Physics, Oakland University
1994–1999	Assistant Professor of Neurology, Case Western Reserve University
1993–1994	Assistant Professor of Radiology, University of Chicago
1991–1992	Instructor, Department of Radiology, University of Chicago

Summary of Evaluation:

Teaching: Dr. Cao is actively involved in the education of residents, students, and other faculty in the Department of Radiation Oncology. She teaches a regular course on Magnetic Resonance Imaging for the physician and physicist residents, and the course continues to expand as the importance of MR and other functional imaging grows in importance for Radiation Oncology. Dr. Cao regularly lectures departmental faculty on quantitative MRI and functional imaging analysis. She is research advisor for a growing number of undergraduate and graduate students (from several departments) as well as post-doctoral fellows who work in her functional imaging laboratory. Dr. Cao is the faculty mentor for one junior faculty member who is progressing nicely in her career, and she is regularly invited to be a faculty member at international meetings and symposia.

Research: Dr. Cao is an expert in MRI imaging as it relates to the treatment of malignant tumors. She has focused her attention on defining improved imaging methods to improve the treatment of brain tumors, hepatic tumors, and head and neck tumors. In each case, she has applied state of the art imaging technology to understand the effects of radiation on both tumors and normal tissues. She has developed a functional image analysis tool (FIAT) that is used to register and quantitatively analyze multiple kinds of images obtained as a function of time. This has permitted, for the first time, quantitative understanding of dose response and time course relationships of radiation changes for both tumors and normal tissues. Dr. Cao's academic productivity has been extraordinary. She has developed a strong national reputation and is

widely regarded as a leader in radiation oncology imaging. She is a crucial collaborator with many faculty in the Department of Radiation Oncology as well with other departments. She plays an essential role in our Conformal Therapy NCI-funded program project grant, is an important co-investigator in a second program project grant centered in the Radiology Department, and is principal investigator of several important NIH-funded clinical imaging studies. The importance of Dr. Cao's research is demonstrated by her series of plenary session talks at the American Society of Therapeutic Radiology and Oncology and American Association of Physicists in Medicine (AAPM) national meetings.

Recent and Significant Publications:

Cao Y, Platt JF, Francis IR, J.M. Balter JM, Pan C, Normolle D, Ben-Josef E, Ten Haken R, Lawrence TS: The prediction of radiation-induced liver dysfunction using a local dose and regional venous perfusion model. *Med Phys* 34(2):604-612, 2007.

Cao Y, Tsien CI, Nagesh V, Junck L, Ten Haken R, Ross BD, Chenevert TL, Lawrence TS: Survival prediction in high-grade gliomas by perfusion MRI prior to and during early stage of RT. *Int J Rad Onc Biol Phys* 64:876-885, 2006.

Cao Y, Nagesh V, Hamstra D, Tsien CI, Junck L, Ross D, Chenevert TL, Lawrence TS: The extent and severity of vascular leakage as evidence of tumor aggressiveness in high-grade gliomas. *Cancer Research* 66(17):8912-8917, 2006.

Cao Y, Tsien CI, Shen Z, Tatro D, Ten Haken R, Kessler M, Chenevert T, Lawrence T: The Use of MRI to assess blood-brain/blood-glioma barrier opening during a course of conformal radiotherapy. *J Clinical Oncology* 23:4127-4136, 2005.

Cao Y, D'Olhaberriague L, Vikingstad EM, Levine SR, and Welch K MA: Pilot study of functional MRI to assess cerebral activation of motor function following post-stroke hemiparesis. *Stroke* 29: 112-122, 1998.

Service: Efforts have been made to protect Dr. Cao's time so she can devote the majority of her effort to research and teaching. In spite of this, she has been a major source of advice and help in development of the Department's imaging efforts as well as collaboration efforts. She is a reviewer for a dozen scientific journals, and has been a member of international and NIH study sections, including five years service as a permanent member of an NIH study section. She also serves as Chair of the AAPM Working Group on Imaging for Treatment Assessment, is a member of the AAPM Imaging Physics Committee, and a board member and treasurer of the Sina-American Network of Therapeutic Radiology and Oncology.

Professional Work: Dr. Cao is very heavily involved in the design, implementation and analysis required for many of the Department's current clinical protocols and studies, since most of those efforts include the integral use of functional imaging studies. She works closely with Radiation Oncology physicians and physicists as well as physicians, physicists and staff from Radiology, Nuclear Medicine, and imaging scientists from other departments, and is crucial to on-going clinical studies.

External Review:

Reviewer A: “Dr. Cao has received national and international recognition for her scholarly accomplishments, as evidenced by her plenary presentation at our national meeting, numerous invited lectures and visiting professorships and presence on national grant review panels. She regularly reviews for international journals, and sits on several national committees, related to imaging and physics in oncology.”

Reviewer B: “Dr. Cao’s scholarship is clearly a cutting edge....Dr. Cao is an expert in the field of functional imaging, and its application to the study of radiation-induced normal tissue injury. She is one of the leaders of this field.”

Reviewer C: “Her ‘professional niche’ is, in my opinion, in the area of applications of non-invasive MR techniques to assess treatment response. This area, of course, is currently a very hot topic within the oncologic imaging and therapy communities...her work in this area is highly relevant.”

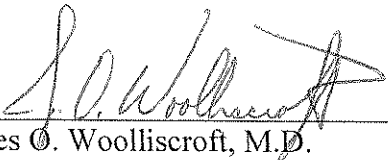
Reviewer D: “Dr. Cao’s academic record is very impressive with more than fifty publications...even more important than quantity is the nature of these publications and their importance to translational research....Dr. Cao is engaged in teaching and training activities, involved in scientific and professional organization, and is highly visible in the national scene.”

Reviewer E: “...Dr. Cao’s work is important not only in defining normal tissue toxicity but also in using imaging as a tumor-response biomarker, which has been recognized as a key research direction...there is *not even a single other accomplished MRI physicist doing similar work anywhere else in the US to my knowledge, although this is about to change in a big way.* She literally has a unique head-start in this important wide area.”

Reviewer F: “She has become very well known for her work in a number of fields, both internationally and nationally, and I know of a number of prestigious Universities that have tried to recruit her...I believe she can obtain a position in any of the great academic establishments throughout this nation. I find it particularly impressive that you recognize her talents and have nurtured her career. She really is a winner and brings great recognition to your institution.”

Summary of Recommendation:

Dr. Cao is a national leader in the field of radiation imaging who is making valuable contributions to the Medical School in the areas of research, teaching, and service. I am pleased, therefore, to recommend her for the granting of tenure in the Department of Radiation Oncology.



James O. Woolliscroft, M.D.

Dean

Lyle C. Roll Professor of Medicine

May 2008