Approved by the Regents
May 19, 2011

PROMOTION RECOMMENDATION
UNIVERSITY OF MICHIGAN
MEDICAL SCHOOL
DEPARTMENT OF INTERNAL MEDICINE
COLLEGE OF ENGINEERING
DEPARTMENT OF BIOMEDICAL ENGINEERING

Thomas D. Wang, M.D., Ph.D., assistant professor of internal medicine, Department of Internal Medicine, Medical School, and assistant professor of biomedical engineering, Department of Biomedical Engineering, College of Engineering, is recommended for promotion to associate professor of internal medicine, with tenure, Department of Internal Medicine, Medical School, and associate professor of biomedical engineering, without tenure, Department of Biomedical Engineering, College of Engineering.

Academic Degrees:

M.D.	1998	Harvard Medical School
Ph.D.	1996	Massachusetts Institute of Technology
M.S.	1987	Massachusetts Institute of Technology
B.S.	1985	Harvey Mudd College, Claremont, CA

Professional Record:

2007-present	Assistant Professor of Internal Medicine and Assistant Professor of Biomedical Engineering, University of Michigan
2005-2007	Instructor of Medicine, Stanford University

Summary of Evaluation:

Teaching: Dr. Wang has focused on teaching medical students, residents, graduate students, postdoctoral fellows, and junior faculty how to perform quality research in a rigorous scientific manner. All of his trainees have attained either an oral presentation at a national meeting or a first author publication in a prestigious peer-reviewed journal. Clinically, he has taught pathophysiology and management of digestive diseases to fellows, residents, and medical students as an attending on service. Dr. Wang also teaches the technical skills of performing upper and lower endoscopy to gastroenterology fellows.

Research: Dr. Wang has five major areas of interest including molecular imaging, confocal microendoscopy, infrared spectroscopy, advanced endoscopy, and two-photon microendoscopy. He pioneered the use of fluorescence-labeled peptides selected by techniques of phage display to detect over expressed cell surface targets in vivo to identify pre-malignant mucosa in the digestive tract. Peptides have tremendous potential for clinical use as molecular probes to target gene expression in vivo. Dr. Wang developed the first fiber coupled dual axes confocal microscope for performing in situ histological evaluation of tissue. This novel confocal microscope design used two lenses and fibers rather than one, so that light is collected off-axis to overcome the effects of scattering and thus achieve tissue penetration depths down to the sub-mucosa. He also developed the first video endoscope that is sensitive to fluorescence to identify

pre-malignant mucosa. His scientific work has implications for radically changing how we think about performing early detection, risk stratification, and personalized surveillance of cancer in the digestive tract that can be further generalized to other hollow organs. Dr. Wang currently holds four grants including three from the NIH. Since joining the University in 2007, Dr. Wang has generated 24 peer-reviewed publications and four patents. He has given 20 invited presentations, three seminars, and has been a visiting professor at numerous academic centers. In recognition of his scientific achievements, Dr. Wang was elected in 2009 to the American Society for Clinical Investigation. Dr. Wang is also an ad-hoc reviewer for the *American Journal of Physiology, Applied Optics, Chinese Optics Letters, Clinical Gastroenterology and Hepatology, Digestive Diseases and Sciences, Gastroenterology, Gastrointestinal Endoscopy, International Journal of Cancer, Journal of Biomedical Optics, Optics Express, Optics Letters, Nature Medicine,* and *Neoplasia.* Dr. Wang sits on an NIH study section for the American Reinvestment and Recovery Act. He serves on the editorial board for *Gastroenterology* and the *World Journal of Clinical Oncology.* He also is a selected summaries contributor to *Gastroenterology.*

Recent and Significant Publications:

Li M, Anastassiades CP, Joshi B, Komarck CM, Piraka C, Turgeon K, Appelman H, Wang TD: Affinity peptide for targeted detection of dysplasia in Barrett's esophagus, *Gastroenterology* 2010, in press.

Hsiung P, Hardy J, Friedland S, Soetikno R, Du CB, Wu AP, Sahbaie P, Crawford JM, Lowe AW, Contag CH, Wang TD: Detection of colonic dysplasia in vivo using a targeted heptapeptide and confocal microendoscopy. *Nature Medicine* 14:454-458, 2008.

Wang TD, Triadafilopoulos G, Crawford JM, Dixon LR, Bhandari T, Sahbaie P, Friedland S, Soetikno R, Contag C. Detection of Endogenous Biomolecules in Barrett's Esophagus by Fourier Transform Infrared Spectroscopy. *PNAS* 104:40:15864-15869, 2007.

Wang TD, Friedland S, Sahbaie P, Soetikno R, Hsiung P, Liu JTC, Crawford JM, Contag C: Functional imaging of colonic mucosa with a fibered confocal microscope for real time *In Vivo* pathology, *Clinical Gastroenterology & Hepatology* 5:1300-1305, 2007.

Liu JTC, Mandella MJ, Ra H, Lee D, Kino GS, Solgaard O, Piyawatthanametha W, Contag CH, Wang TD: Miniature near-infrared dual-axes confocal microscope utilizing a two-dimensional microelectromechanical systems scanner. *Optics Letters* 32:256-258, 2007.

Service: Dr. Wang has served on several committees starting at the division level. For the 2009-2010 academic year, Dr. Wang was part of the Gastroenterology Grand Rounds Speaker Committee. He also devoted time to the University as part of the NCRC Imaging Center Committee. Dr. Wang served nationally as the co-chair of the Scientific Program Committee for the American Association for Cancer Research. Internationally, he serves as the conference chair of SPIE Biomedical Optics and is the chair of the NIH Network for Translational Research Steering Committee.

External Review:

Reviewer A: "Tom has most recently been attacking GI disease from a totally different angle. He has been developing novel peptide targeting markers...the result could be a significant impact on the management of screening and surveillance for both disease types, with potential positive impact on the healthcare system. In short, it is clear that Tom focuses on high impact problems and approaches them with novel powerful tools."

Reviewer B: "Dr. Wang is clearly one of the leading scientist [sic] in the world working in the area of advanced optical endoscopy. He has made significant contributions in instrumentation development, contrast agent development, and clinical application. His dual M.D. and Ph.D. training enables him to be one of the world leaders in pushing forward the translational aspects of novel optical diagnostic imaging technology."

Reviewer C: "Thomas Wang is one of the very rare talented people which do excellent science with a clear clinical impact....He is also a very talented speaker and I always enjoy his talks at the important Gastroenterology meetings like the Digestive Disease Week. He received many grants and he is very well awarded which reflects his outstanding research activity."

Reviewer D: "I would say that he is the leader in the area of molecular imaging in vivo in the mucosal gastrointestinal tract...Globally, this is a very large issue as colon cancer, esophageal cancer, and gastric cancer are all fairly important cancers in the United States as well as Countries overseas...I would anticipate that he would be qualified to be associate professor at any major academic center in the Country."

Reviewer E: "Tom's overall package is very strong. He has published >25 peer-reviewed journal articles with an *h*-index of 10, which is excellent for his stage of career. His research has been extremely well funded. Most notably, he received within a short time frame a highly competitive U54 (NTR) award and an equally competitive BRP grant, which are usually awarded to senior investigators. In his peers, Tom would easily be ranked in the top 10%...I have no doubt his success will continue and expand."

Summary of Recommendation:

Dr. Wang is an outstanding physician scientist. He is an educator with proven teaching and clinical abilities and has an exemplary research program. He has demonstrated excellent academic growth and leadership and we enthusiastically support his proposed promotion to associate professor, with tenure, in the Department of Internal Medicine and associate professor, without tenure, in the Department of Biomedical Engineering.

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

David C. Munson, Jr.
Robert J. Vlasic Dean of Engineering
College of Engineering

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