

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

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

2013-present	Associate Professor of Mechanical Engineering, University of Michigan
2011-present	Associate Professor of Biomedical Engineering, University of Michigan
2011-present	Associate Professor of Internal Medicine, University of Michigan
2007-2011	Assistant Professor of Internal Medicine, University of Michigan
2007-2011	Assistant Professor of Biomedical Engineering, University of Michigan
2003-2007	Instructor of Medicine, Stanford University

Summary of Evaluation:

Teaching: Dr. Wang provides extensive research mentoring to undergraduate students, graduate students, medical students, residents, clinical fellows, research fellows, and visiting scholars. He focuses on teaching the basic principles of successful scientific investigation for both laboratory based research projects and clinical research projects. Dr. Wang also mentors clinical trainees in the outpatient clinic setting and on the inpatient consult service, as well as instructing GI fellows on endoscopic procedures. His trainees have been very successful, with many going on to careers in academia and industry. Dr. Wang has also participated in the Biomedical Engineering

Seminar Series Course, and lectured and led break-out groups in the Medico-Technological Frontiers of Digestive Diseases course that is taken by engineering and medical students.

Research: Dr. Wang's research focuses on the development of novel imaging agents and technologies for the early detection of cancer. With his training and experience in biology, medicine, electrical engineering, and biomedical engineering, his work is highly translational, identifying targets for *in vivo* imaging and developing the agents and instruments to detect pre-malignant lesions in the digestive tract. Dr. Wang's work is also highly collaborative, as can be seen from his role in the NIH-funded imaging projects: the Network for Translational Research, the Bioengineering Research Partnership, and the Barrett's Esophagus Translational Research Network. These consortia involved collaborations between engineering and medicine, multiple academic institutions, and industry. The impact of Dr. Wang's work and the esteem in which he is held are evident in his 90 peer-reviewed publications (with many in high impact journals), six patents, outstanding track record of extramural funding totaling more than \$23M, service on editorial boards and NIH study sections, and numerous invited national and international presentations. In 2009, he was inducted into the American Society of Clinical Investigation, and in 2012, he was named as a fellow of the American Gastroenterological Association. At the University of Michigan, Dr. Wang received the Internal Medicine Jerome W. Conn Award for Research Excellence in 2011, and was also inducted into the League of Research Excellence the same year. In 2014, he was named as the H. Marvin Pollard Collegiate Professor of Endoscopy Research.

Recent and Significant Publications:

Sturm MB, Joshi BP, Lu S, Piraka C, Khondee S, Elmunzer BJ, Kwon RS, Beer DG, Appelman HD, Turgeon DK, Wang TD: Targeted endoscopic imaging of Barrett's neoplasia with specific fluorescent-labeled peptide: first in-human results. *Science Translational Medicine* 5:184ra61, 2013.

Liu Z, Miller SJ, Joshi BP, Wang TD: Targeted wide-field fluorescence imaging of colonic dysplasia with near-infrared octapeptide. *Gut* 62:395-403, 2013.

Atreya R, Neumann H, Neufert C, Waldner MJ, Billmeier U, Zopf Y, Willma M, App C, Münster T, Kessler H, Maas S, Gebhardt B, Heimke-Brinck R, Reuter E, Dörje F, Rau TT, Uter W, Wang TD, Kiesslich R, Vieth M, Hannappel E, Neurath MF: In vivo imaging using fluorescent antibodies to tumor necrosis factor predicts therapeutic response in Crohn's disease. *Nature Medicine* 20:313-318, 2014.

Qiu Z, Khondee S, Duan X, Li H, Mandella MJ, Joshi BP, Zhou Q, Owens SR, Kurabayashi K, Oldham KR, Wang TD: Vertical cross-sectional imaging of colonic dysplasia in vivo with multi-spectral dual axes confocal endomicroscopy. *Gastroenterology* 146:615-617, 2014.

Khondee S, Rabinsky EF, Owens SR, Joshi BP, Qiu Z, Duan X, Zhao L, Wang TD: Targeted therapy of colorectal neoplasia with rapamycin encapsulated in peptide-labeled pegylated octadecyl lithocholate micelles. *Journal of Controlled Release* 199:114-121, 2015.

Service: Dr. Wang provides patient care in the management of general gastrointestinal disease in the outpatient clinic and inpatient service settings, and also performs endoscopic procedures. Institutionally, he serves as a faculty champion in diagnostics for the Medical School Fast Forward for Medical Innovation (FFMI) initiative. Nationally, he is the chair of the American Gastroenterological Association Committee on Molecular Diagnostic Imaging of GI Cancers, and has served as the co-chair of the Frontiers in Cancer Prevention Research Scientific Program Committee for the American Association for Cancer Research. Dr. Wang is also a member of the Steering Committee for the NIH/NCI Barrett's Esophagus Translational Research Network, and a member of the Physiology Section Scientific Committee for the OESO World Organization for the Specialized Studies on Diseases of the Esophagus.

External Reviewers:

Reviewer A: "Dr. Wang's work is published in several peer-reviewed journals including *Gastroenterology*, *Science Translational Medicine*, and *Nature Medicine*. Also noteworthy, is that Tom holds six patents and has four additional patents that are pending. Tom's research definitely will continue to accelerate the impact of technology to improve patient outcomes, particularly in the area of Barrett's esophagus and colon cancer."

Reviewer B: "...Tom has been remarkably productive by the metrics of publications, grant support, mentorship, and national as well as international recognition. Tom's expertise is in the area of molecular imaging with an emphasis on early detection of GI neoplasia. This work has focused on the parallel tracks of both molecular probe development and devices to detect these molecular probes *in vivo*. This is a challenging area, but one with important implications for enhanced approaches to the early detection of cancer. He is widely recognized nationally and internationally as a thought leader in the field of molecular imaging."

Reviewer C: "In evidence of the impact of his research and publications, he is consistently asked to serve on NIH study sections and also has had continuous NIH funding support since 2007. ...Dr. Wang is a highly successful physician scientist. He is among the top recognized scientists in the field of novel imaging modalities for endoscopy. His publication and presentation record are outstanding."

Reviewer D: "...Dr. Wang is truly the prototype idealized hybrid physician/scientist that would be the goal for almost every MD PHD [sic] student or graduate....I would rate him as one of the top 10 people in the country translating innovations in biomedical optics into clinical trials....I have always been impressed with his capabilities and achievements, and in awe at his ability to walk both sides of the translation fence in the lab and the clinic....The translational field is a minefield with many people not succeeding, but he is. This is extremely rare."

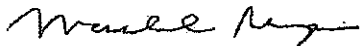
Reviewer E: "Quite simply, Dr. Wang is one of the most creative investigators in the fields of optical diagnostics and gastrointestinal cancer diagnosis....Dr. Wang is a pioneer in molecular imaging in the gastrointestinal tract, having developed the first clinically viable targeted molecule agents for Barrett's esophagus and dysplasia. He additionally has translated his work

for human use, a feat that only he has accomplished in the US. His achievements in biomedical and molecular imaging science are unparalleled and, as such, I consider him to be one of the most important investigators in our field.”

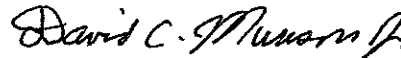
Reviewer F: “Tom’s salient strength derives from his research on both biomarkers and endoscopic instruments....In his peers, Tom would easily be ranked in the top 10%....I have no doubt his success will continue and expand.”

Summary of Recommendation:

Dr. Wang is recognized internationally as a leader in the area of molecular imaging. He is also a dedicated educator and an outstanding clinician. Therefore, we wholeheartedly recommend Thomas D. Wang, M.D., Ph.D. for promotion to professor of internal medicine, with tenure, Department of Internal Medicine, Medical School, professor of biomedical engineering, without tenure, Department of Biomedical Engineering, Medical School and College of Engineering, and professor of mechanical engineering, without tenure, Department of Mechanical Engineering, College of Engineering.



Marshall S. Runge, M.D. Ph.D.
Executive Vice President for Medical Affairs
Dean, Medical School



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

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