

PROMOTION RECOMMENDATION
THE UNIVERSITY OF MICHIGAN
MEDICAL SCHOOL
DEPARTMENT OF MOLECULAR AND INTEGRATIVE PHYSIOLOGY
DEPARTMENT OF INTERNAL MEDICINE

Yatrik Shah, Ph.D., associate professor of molecular and integrative physiology, with tenure, Department of Molecular and Integrative Physiology, and associate professor of internal medicine, without tenure, Department of Internal Medicine, Medical School, is recommended for promotion to professor of molecular and integrative physiology, with tenure, Department of Molecular and Integrative Physiology, and professor of internal medicine, without tenure, Department of Internal Medicine, Medical School.

Academic Degrees:

Ph.D.	2005	Medical College of Ohio
B.S.	2000	Bowling Green State University

Professional Record:

2014-present	Associate Professor of Molecular and Integrative Physiology, University of Michigan
2014-present	Associate Professor of Internal Medicine, University of Michigan
2009-2014	Assistant Professor of Molecular and Integrative Physiology, University of Michigan
2009-2014	Assistant Professor of Internal Medicine, University of Michigan

Summary of Evaluation:

Teaching: Dr. Shah is an exemplary teacher and is highly rated by his students. He routinely lectures in several physiology courses and is the course director for Physiology 415 for master and undergraduate students. Upon arriving at the University of Michigan, Dr. Shah had no classroom teaching experience, however, he has shown remarkable growth in this area and is incorporating the latest interactive teaching techniques into his classes. Dr. Shah has served on 10 doctoral dissertation committees, eight examination committees, and has mentored numerous fellows and students. Four of his former fellows were highly successful while in his lab and have secured faculty positions with his guidance. He has demonstrated that he is fully devoted to training junior scientists and promoting their careers.

Research: Dr. Shah's research is focused on studying the molecular mechanisms by which oxygen sensing transcription factors regulate gastrointestinal homeostasis, inflammation and cancer. Cellular oxygen level is an important systemic signal that modulates metabolic activities and disease in the liver and intestine. Low cellular oxygen, also referred to as hypoxia, is observed in several gastrointestinal diseases. Using the latest mouse transgenic technology, Dr. Shah's lab has developed novel animal models to study the role of oxygen sensitive transcription factors and have revealed new pathways that have not previously been associated with hypoxia. Dr. Shah's research has garnered numerous distinguished awards including: a new investigator award from the American Physiological Society and the American Gastroenterological Association; The Cozzarelli Prize from the National Academy

of Science; the Henry Pickering Bowditch award from the American Physiological Society, and the Dean's Award in Basic Science Research from the University of Michigan.

Recent and Significant Publications:

Taylor M, Aijuan Q, Anderson E, Matsubara T, Martin A, Gonzalez FJ, Shah YM: Hypoxia-inducible factor-2 α is required for the adaptive increase of intestinal ferroportin during iron deficiency. *Gastroenterology* 140:2044-2055, 2011.

Xue X, Taylor M, Anderson E, Hao C, Qu A, Geenson JK, Zimmerman E, Gonzalez FJ, Shah YM: Hypoxia-inducible factor-2 α promotes colorectal cancer progression by dysregulating iron homeostasis. *Cancer Research* 72:2285-2293, 2012.

Xue X, Ramakrishnan S, Anderson E, Taylor M, Zimmermann EM, Spence JR, Huang S, Greenson JK, Shah YM: Endothelial PAS domain protein 1 activates the epithelial-elicited pro-inflammatory response to promote colitis in mice. *Gastroenterology* 145:831-841, 2013.

Ramakrishnan SK, Zhang H, Takahashi S, Centofanti B, Perisamy S, Weisz K, Chen Z, Ulher MD, Rui L, Gonzalez FJ, Shah YM: HIF-2 α is an essential molecular brake for the hepatic glucagon response through inhibition of PKA signaling. *Cell Metabolism* 23:505-516, 2016.

Xue X, Ramakrishnan SK, Weisz K, Triner D, Xie L, Attili D, Pant A, Györffy B, Zhan M, Carter-Su C, Hardiman KM, Wang TD, Dame M, Varani J, Brenner D, Fearon ER, Shah YM: Iron uptake via DMT1 integrates cell cycle with JAK-STAT3 signaling to promote colorectal tumorigenesis. *Cell Metabolism* 24:447-461, 2016.

Service: Dr. Shah currently serves on several institutional committees and is the director of the Molecular and Integrative Physiology (MIP) Postdoctoral Program and co-director for the MIP Summer Undergrad Research Fellowship Program. He recently joined the Cancer Center Education Leaders Council, which develops educational and mentoring initiatives. He helped to initiate a program for underrepresented minority undergrad students to conduct gastrointestinal cancer research, and has submitted a R25 to fund an additional 20 fellows. At the national level, he is a long-standing member of the three major societies in his field and serves on the editorial boards of the top major journals in his field.

External Reviewers:

Reviewer A: "At this juncture of his career he is among the top investigators in the field of mammalian iron homeostasis in the world...Clearly, he has inspired his trainees to maximize their efforts in the lab. Furthermore, his level of grant support demonstrates he is able to provide his trainees with the resources needed to accomplish their research goals at a high level."

Reviewer B: "Yatrik's research has had deep impact in several aspects of hypoxia sensing, iron metabolism and colon carcinogenesis....Dr. Yatrik Shah is an outstanding researcher who is highly recognized nationally and internationally. He publishes in first rate top tier journals and is highly productive, maintains an outstanding level of extramural funding and exhibits excellent and strong commitment to service."

Reviewer C: “Yatrik is also regularly invited to international meetings on GI diseases and associated cancers, serves on the editorial board of *Gastroenterology*, and frequently reviews papers for top tier journals such as *Science*, *Cancer Cell*, and *Cell Metabolism*. It should be noted that the overall productivity from the Shah laboratory has continued to accelerate since his promotion to the rank of Associate Professor with tenure in 2013.”

Reviewer D: “Dr. Shah’s standing in the field is objectively reflected by multiple invitations to present his work at world-class institutions and international conferences. In my observations of his presentations and my personal interactions with Dr. Shah, I can attest to the fact that he is an outstanding ambassador for the University of Michigan. I found him to be a thoughtful and insightful thinker who generously contributes to discussions in an open-minded and inclusive way. He has a broad and deep knowledge of the field which is reflected in his research outputs. Dr. Shah is also an effective and prolific mentor of both postdoctoral and postgraduate trainees and fellows.”

Reviewer E: “Despite the tight funding conditions in this country, his research is currently funded by 2 R01 grants and SPORE grant as principal investigator, and another R01 as a co-investigator. His accomplishment in scholastic activities is nothing short of being a superstar....He has demonstrated his star quality in every category and he deserves promotion to Professor with Tenure for his past and current achievements and the expectation of greatness.”

Summary of Recommendation:

Dr. Shah is an outstanding scientist, collaborator and teacher. His scholarly contributions are truly impressive as supported by his publication record and by comments from the list of outside high profile reviewers. He has also been highly successful in securing federal and foundation grant support, in addition to receiving several career development awards and honors. His service to the department and institution are also outstanding. Therefore, I am pleased to recommend Yatrik M. Shah, Ph.D. for promotion to professor of molecular and integrative physiology, with tenure, Department of Molecular and Integrative Physiology, and professor of internal medicine, without tenure, Department of Internal Medicine, Medical School.



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

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