Approved by the Regents
May 17, 2018

PROMOTION RECOMMENDATION
THE UNIVERSITY OF MICHIGAN
MEDICAL SCHOOL
DEPARTMENT OF COMPUTATIONAL MEDICINE AND BIOINFORMATICS
DEPARTMENT OF INTERNAL MEDICINE

Yuanfang Guan, Ph.D., assistant professor of computational medicine and bioinformatics, Department of Computational Medicine and Bioinformatics, and assistant professor of internal medicine, Department of Internal Medicine, Medical School, is recommended for promotion to associate professor of computational medicine and bioinformatics, with tenure, Department of Computational Medicine and Bioinformatics, and associate professor of internal medicine, without tenure, Department of Internal Medicine, Medical School.

Academic Degrees:

Ph.D.	2010	Princeton University
B.S.	2005	University of Hong Kong

Professional Record:

2012-present	Assistant Professor of Computational Medicine and Bioinformatics, and Assistant Professor of Internal Medicine, University of Michigan
2011-2012	Research Investigator, Department of Computational Medicine and Bioinformatics, and Research Investigator, Department of Internal Medicine

Summary of Evaluation:

Teaching: Dr. Guan currently has five Ph.D. students and one master's student in her laboratory. During the past five years, she has trained two post-doctoral fellows and one undergraduate. Her former post-doctoral fellows have been successful with one having taken a position as a software engineer in Baidu Inc., one doing a second post-doctoral fellow at the La Jolla Institute of Immunology, and another has taken a faculty position at Central South University. She has been on six dissertation committees (four still active) and active in prelims. Locally, Dr. Guan participates in high school bioinformatics camps and serves as a judge for science fair competitions. At Michigan, she has taken an active role in teaching and has been leading the Bioinformatics Journal Club for the past four years (BIOINFO 602). This course is required for two semesters for all bioinformatics graduate students. She has been successful in reformatting this course to better prepare students in their professional presentations and overall understanding of the bioinformatics field. She also participates in the machine learning graduate level course in Bioinformatics (BIOINF 585). Dr. Guan's teaching feedback has improved greatly since her arrival at Michigan and we are in discussions with the Department of Computer Science and Engineering about developing a cross-listed course on machine learning applications.

Research: Dr. Guan's research is focused on utilizing machine-learning methods to make accurate predictions of clinical outcomes and developing novel algorithms for high-throughput data analysis. She has published 49 papers in total including papers in *Science, Nature Methods, Nature Communication* of which 41 have been published since arriving at Michigan. Dr. Guan is a rising star

winning 11 DREAM (Dialogue for Reverse Engineering Assessments and Methods) challenges in the past five years. This is the most influential benchmark competition in the field of systems biology and bioinformatics and her record has never been seen in the history of DREAM. This is a significant honor that carries with it national recognition. Dr. Guan has the ability to simplify highly complicated problems by using customized algorithmic approaches. Since arriving at Michigan, Dr. Guan has secured an R21, a prestigious NSF Career Award and, more recently funding from the Altzheimer's Foundation. She has also been a co-investigator on the University of Michigan O'Brien Kidney Translational Core Center, the Alzheimer's Disease Center, and a European rare kidney disease grant. She is also involved with the new single cell MIDAS project and the Kretzler lab NEPTUNE project. Several of her students are also partially funded by training grants as well as industry donations received in her lab recently from Mediconns Bippharmaceutical. Dr. Guan has been an active participant in annual national ISMB meetings, RECOMB RegSysGen Meetings and has been a speaker several times for both organizations.

Recent and Significant Publications:

Zhu F, Guan Y: Predicting dynamic signaling network response under unseen perturbations. *Bioinformatics* 19:2772-2778, 2014.

Zhu F, Shi L, Li H, Eksi R, Engel JD, Guan Y: Modeling dynamic functional relationship networks and application to ex vivo human erythroid differentiation. *Bioinformatics* 1;30(23):3325-33, 2014.

Zhu F, Shi L, Engel JD, Guan Y: Regulatory network inferred using expression data of small sample size: application and validation in erythroid system. *Bioinformatics* 1;31:2537-2544, 2015.

Zhu F, Panwar B, Dodge HH, Li H, Hampstead BM, Albin RL, Paulson HL, Guan Y: COMPASS: A computational model to predict changes in MMSE scores 24-months after initial assessment of Alzheimer's disease. *Sci Rep* 6:34567, 2016.

Panwar B, Omenn GS, Guan Y: miRmine: a database of human miRNA expression profiles. *Bioinformatics* 33:1554-1560, 2017.

Service: Dr. Guan has been an ad hoc member of the Natural Sciences and Engineering Research Council of Canada (NSERC) since 2017 and recently was appointed as an ad hoc reviewer for the Alzheimer's Foundation. She is also an ad hoc reviewer for the following journals: *Bioinformatics*, *PLoS One*, *BMC Systems Biology*, *Bioanalysis*, *PLoS Computational Biology*, *BMC Bioinformatics*, *BMC Genomics*, *Proteomics*, *Computers in Biology and Medicine*, *Cell*, *BioData Mining* and *Molecular and Cellular Biology*.

For the department, she has served on the DCMB Admissions Committee and on several preliminary examination committees. Dr. Guan has co-chaired the Journal Club since 2014 and is extremely influential in the development of several local high school students through her Bioinformatics Camps and involvement in the local high school science fair competitions. Most recently, one of the high school students she coached successfully entered the INTEL Science Talent Search finalist and placed #1 in Michigan and #40 in the US. She also coached another high school student who placed 2nd in a DREAM challenge.

External Reviewers:

Reviewer A: "...Yuanfang's expertise is extremely versatile and valuable. In terms of analyzing diverse biological data, Yuanfang is probably one of the people who have the most hands-on experience in the world, not mentioning that she has handled them in such a successful way."

Reviewer B: "Her broad bioinformatics skills and productivity are a real asset. This is especially true in the era of big data and data science where faculty with these kinds of skills and productivity are really hard to find and retain. I am confident that her successful career will continue to soar and that she will do great things for the Michigan community and the USA more broadly."

Reviewer C: "It is clear that Dr. Guan's productivity is excellent. Since coming to Michigan, she has continued to publish frequently in good to excellent journals. In addition, her funding from external sources is superb by current standards for those in her field. She has been both a productive co-investigator on several grants and has also served as the PI of others. This latter point separates her from many junior bioinformaticians, who struggle to obtain independent funding. This speaks well of her abilities and resourcefulness."

Reviewer D: "Frankly, I'm quite impressed in all areas. As an NSF Career Award recipient, she certainly is an outstanding early scientist and she has been very active on several grants. I think she's off to a fantastic start and would be considered a top 5% performer at the institutions of which I'm acquainted which includes some highly-rated universities."

Reviewer E: "As a department head, I shall comment that with her performance and profile she would be considered a star here, and I would work hard not to lose her to other institutions. Therefore, I believe hers is a straightforward case."

Summary of Recommendation:

Dr. Guan is an internationally recognized expert in machine learning against heterogeneous biomedical data to discover new knowledge and to improve clinical decision-making. Notably, Dr. Guan logged ten first place finishes in the highly competitive DREAM Challenges competitions, more than any other researcher worldwide. This is a significant honor that carries with it an international recognition of excellence. She is also a team scientist, and has contributed greatly to the success of the renal systems biology efforts in the Department of Internal Medicine. I am pleased to recommend Yuanfang Guan, Ph.D. for promotion to associate professor of computational medicine and bioinformatics, with tenure, Department of Computational Medicine and Bioinformatics, and associate 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

May 2018