Approved by the Regents
May 19, 2022

PROMOTION RECOMMENDATION
The University of Michigan
College of Literature, Science, and the Arts

Randy B. Stockbridge, assistant professor of molecular, cellular, and developmental biology, and assistant professor of biophysics, College of Literature, Science, and the Arts, is recommended for promotion to associate professor of molecular, cellular, and developmental biology, with tenure, and associate professor of biophysics, without tenure, College of Literature, Science, and the Arts.

Academic Degrees:
Ph.D. 2010 University of North Carolina
B.A. 2005 Princeton University

Professional Record:
2016 – Present Assistant Professor, Department of Molecular, Cellular, and Developmental Biology, University of Michigan
2016 – Present Assistant Professor, Program in Biophysics, University of Michigan
2011 – 2015 Post-doctoral Associate, HHMI and Brandeis University

Summary of Evaluation:
Teaching: Professor Stockbridge is a dedicated educator who has contributed to the teaching missions of Molecular, Cellular, and Developmental Biology (MCDB) and Biophysics. Since joining the UM faculty, she has taught five courses, including the large enrollment course Introductory Biochemistry (MCDB 310). Professor Stockbridge has been instrumental in updating the curriculum in this course, introducing online research tools describing protein structures into the curriculum. In addition, she has developed two distinct courses for upper-level undergraduates: Structural Biology I (BIOPHYS 420/MCDB 420) and Advanced Biochemistry (MCDB 401). She has also participated in two team-taught graduate-level courses: Experimental Models in MCDB (MCDB 614) and Principles of Macromolecular Crystallography (BIOPHYS 602). Outside of the traditional classroom, Professor Stockbridge has been a strong mentor for post-doctoral fellows, graduate students, and undergraduate researchers. At multiple levels, Professor Stockbridge's contributions have had a significant positive impact on MCDB's educational mission.

Research: Professor Stockbridge is a molecular biologist who combines structural biology, biophysics, and physiology to study membrane transporters that allow bacterial cells to remove harmful chemicals. She is a world expert in the study of Flux/Fluoride (F^-) channels, which selectively allow the passage of F^- across the membrane, allowing bacteria to export this toxic compound. She has also identified the molecular basis for cargo specificity between membrane transporters of the Small Multidrug Resistance (SMR) family. Small membrane bound proteins are notoriously difficult to study at the atomic level, and Professor Stockbridge has developed several methodologies to facilitate solving the structure of these proteins. In her short time here at the University of Michigan, Professor Stockbridge has established a world-class research program that is supported by multiple federal and private funding agencies. She has also

received several national and international awards for her research. Her broad, multi-disciplinary approach to studying membrane transporters/channels puts her at the forefront of this important field, and her upward trajectory predicts she will continue to make important discoveries in the future.

Recent and Significant Publications:

McIlwain, B.C., Gundepudi, R., Koff, B.B., & Stockbridge, R.B. (2021). "The fluoride permeation pathway and anion recognition in Fluc family fluoride channels." *eLife*, *10,* e69482. doi: 10.7554/eLife.69482.

Kermani, A.A., Macdonald, C.B., Burata, O.E., Koff, B.B., Koide, A., Denbaum, E., Koide, S., & Stockbridge, R.B. (2020). "Structural basis of promiscuity in Small Multidrug Resistance transporters." *Nature Communications*, *11*. doi:10.1038/s41467-020-19820-8.

McIlwain, B.C., Martin, K., Hayter, E.A., & Stockbridge, R.B. (2020). "An interfacial sodium ion is an essential structural feature of Fluc family fluoride channels." *Journal of Molecular Biology*, *432*(4), 1098-1108. doi: 10.1016/j.jmb.2020.01.007.

Kermani, A.A., Macdonald, C.B., Gundepudi, R., & Stockbridge RB. (2018). "Guanidinium export is the primal function of SMR family transporters." *Proceedings of the National Academy of Sciences of the United States of America*, *115*(12), 3060-3065. doi: 10.1073/pnas.1719187115.

Service: Professor Stockbridge has performed valued service at multiple levels. Within MCDB and Biophysics, she has served on the graduate admissions committee and two faculty search committees. She has also been an elected member of MCDB's executive committee. In all these capacities, Professor Stockbridge's service was exemplary. Beyond the unit, she has served on advisory committees related to improving the university's structural biology infrastructure. She also serves on the editorial boards of two prominent research journals (*Journal of General Physiology* and *eLife*) and has served on grant review panels for the National Institutes of Health.

External Reviewers:

Reviewer (A): "This is one of the strongest cases I have been asked to evaluate in recent years…I think she is an outstanding scientist, both scholarly and creative."

Reviewer (B): "[Professor Stockbridge's] research program is ambitious, fearless, interesting, creative, and timely. Not only is it a research program with great potential to bring about fundamental discoveries that will deepen our understanding of transport mechanisms…but also she is generating tools and approaches that are likely to be extremely useful in the membrane protein field."

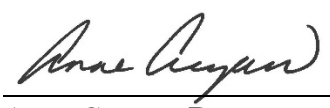
Reviewer (C): "[Professor Stockbridge] has developed and tested MPER tags…This is a landmark discovery. Its development and applicability are likely to revolutionize the field of structural biology and our acquisition of folded protein architecture and function."

Reviewer (D): "[Professor Stockbridge] is a brilliant scientist with superb scientific acumen who thinks deeply and clearly about her research and her field, uses innovative and creative approaches, and has a most impressive track record of exciting discoveries."

Reviewer (E): "Overall, I consider Dr. Stockbridge's contributions to be a sound foundation, providing reliable results on the mechanisms of two main protein classes she is studying. Her work is of high quality, and it advances the field."

Reviewer (F): "Overall, I think that [Professor Stockbridge] has established herself as a leader in using structural and functional approaches to investigate the mechanisms of the fascinating family of small transporters and ion channels. Her work has consistently been on the cutting edge, addressing unresolved and critical mechanistic questions in the field, and the quality of data and clarity of thinking have been of the highest caliber."

Summary of Recommendation:
Professor Stockbridge is a world leader in the study of small membrane proteins that transport charged molecules across biological membranes. Her well-funded research program has made and will continue to make fundamental advances about the structural and biophysical properties of membrane transporters/channels. She is a dedicated and innovative teacher, contributing to both undergraduate and graduate education. Her record of service is also exemplary, at the departmental, university, and national/international level. The Executive Committee of the College of Literature, Science, and the Arts and I recommend that Assistant Professor Randy B. Stockbridge be promoted to the rank of associate professor of molecular, cellular, and developmental biology, with tenure, and associate professor of biophysics, without tenure, College of Literature, Science, and the Arts.



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