Approved by the Regents
May 16, 2024

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

Jennifer D. Bridwell-Rabb, assistant professor of chemistry, College of Literature, Science, and the Arts, is recommended for promotion to associate professor of chemistry, with tenure, College of Literature, Science, and the Arts.

Academic Degrees:

Ph.D.	2012	Texas A&M University
B.S.	2007	Central Michigan University

Professional Record:

2022-present	William R. Roush Assistant Professor of Chemistry, University of Michigan
2017-2022	Assistant Professor of Chemistry, University of Michigan
2012-2017	HHMI and NIH Post-doctoral Research Fellow, Massachusetts Institute of Technology

Summary of Evaluation:
Teaching: Professor Bridwell-Rabb is an excellent educator of undergraduate and graduate students. She regularly teaches Chem 351, biochemistry fundamentals, to more than 100 students per term. In this class, she helps students develop critical thinking while also incorporating art into science. She worked with a team of instructors to modify the curriculum. Professor Bridwell-Rabb's major contribution was rewriting the syllabus to communicate how students should use all the available resources to succeed. She also incorporated a new textbook during one of the semesters she taught the class. Students specifically recognize the energy and excitement she brings to classroom teaching. In addition, Professor Bridwell-Rabb mentors graduate students by fostering peer-based learning. She developed a series of thematic games based on the TV-show Jeopardy to reinforce basic biochemistry knowledge. Three doctoral students have graduated from her lab already, and she is currently mentoring seven doctoral students, two post-doctoral fellows, and four undergraduates.

Research: Professor Bridwell-Rabb is a recognized expert in the field of metallobiochemistry. She uses many biochemical techniques to work with sensitive proteins that are very difficult to recombinantly express, purify, and study. This ability to work with challenging proteins distinguishes her from others in her field. Specifically, Professor Bridwell-Rabb works on Rieske-type Oxygenases, enzymes that are found in all forms of life, and are involved in both the degradation and the biosynthesis of organic compounds. She has discovered novel mechanisms of how these enzymes regulate their reactivity. This fundamental discovery has led to new methods to reprogram, evolve, or customize the chemical reactions catalyzed by Rieske oxygenases. She showed for the first time that one of the enzymes involved in the synthesis of chlorophylls, which are key molecules in photosynthesis, is a Rieske oxygenase and elucidates mechanisms of these reactions. She has received numerous external awards, including the Searle Scholars Award (2019), the Beckman Young Investigator Award (2020), the Department of

Energy Early Career Award (2020), the Ed Stiefel Young Investigator Award (2023), and she has been named a Kavli Fellow (2022) and an Alfred P. Sloan Research Fellow (2023). These are some of the top awards, and they provide over $2.5 M in direct funding. Professor Bridwell-Rabb is in an excellent position to continue making outstanding contributions to her field, to the Department of Chemistry, and to UM.

Recent and Significant Publications:

Tian, J., Liu, J., Knapp, M., Donnan, P.H., Boggs, D.G., and Bridwell-Rabb, J. (2023). Custom tuning of Rieske oxygenase reactivity. *Nature Communications*, *14*(1), 5858.

Liu, J., Tian, J., Perry, C., Lukowski, A.L., Doukov, T.I., Narayan, A.R.H., and Bridwell-Rabb, J. (2002). Design principles for site-selective hydroxylation by a Rieske oxygenase. *Nature Communications*, *13*(1), 255.

Liu, J., Knapp, M., Jo, M., Dill, Z., and Bridwell-Rabb, J. (2022). Rieske oxygenase catalyzed C–H bond functionalization reactions in Chorophyll *b* biosynthesis. *ACS Central Science*, *8*(10), 1393-1403.

Lukowski, A.L., Liu, J., Bridwell-Rabb, J., and Narayan, A.R.H. (2020). Structural basis for divergent C–H hydroxylation selectivity in two Rieske oxygenases. *Nature Communications*, *11*(1), 2991.

Service: Professor Bridwell-Rabb has been an excellent citizen—both to the department and to her scientific communities. In the Department of Chemistry, she has served on the graduate admissions committee, faculty search committee, and graduate recruiting committee. At the university level, she was elected to the UM Senate Assembly. Outside the university, she co-organized a Metals in Structural Biology Workshop at SSRL-LCLS and she is on the editorial board of *Nature Communications Chemistry*.

External Reviewers:

Reviewer (A): "Overall, [Professor Bridwell-Rabb] has clearly established herself in the area of Rieske monooxygenases and based on the many presentations I have seen her give, her contributions are well-regarded…. I would point out that this [the teaching statement] is one of the most thoughtful statements I have seen. She is clearly taking the time to think about the teaching and learning and incorporating active learning strategies into her classroom."

Reviewer (B): "Without a doubt, Professor Bridwell-Rabb is a rising star in structural enzymology and metalloenzymology, which is supported by a glance at her curriculum vitae. Her output is strong, and her scholarship is impeccable."

Reviewer (C): "It is easy for me to state at the outset that Dr. Bridwell-Rabb is in the top echelon of her peer group in the application of structural biology in combination with the full repertoire of modern techniques of biochemistry to address current areas of intense research interest. She has established collaborations and funding for these projects, and publications notable for their insight and spectacular presentation are now emerging."

Reviewer (D): "In terms of the scholarly impact, I would like to emphasize that Prof. Bridwell-Rabb's papers demonstrate a level of thoughtfulness and insights that go well beyond the descriptive narrative that characterizes many papers today."

Reviewer (E): "Overall, Prof. Bridwell-Rabb is running an exciting and high profile research program. Her innovate [sic] approaches to challenging protein targets have allowed her to succeed where others have failed, and have set her up for some very exciting future work in the realm of metalloenzyme characterization and engineering."

Reviewer (F): "In my opinion there is no doubt that Jennifer Bridwell-Rabb is an early career scientist with outstanding promise, who is going after important problems that have long been avoided because of their experimental difficulties. She has made unique discoveries and has provided important mechanistic insights."

Summary of Recommendation:
Professor Bridwell-Rabb has established a renowned program in chemical biology and metallobiochemistry. She is a creative, dedicated scholar who excels in teaching and service. The Executive Committee of the College of Literature, Science, and the Arts and I recommend that Assistant Professor Jennifer D. Bridwell-Rabb be promoted to the rank of associate professor of chemistry, with tenure, College of Literature, Science, and the Arts.

Anne Curzan, Dean
Geneva Smitherman Collegiate Professor of
English Language and Literature, Linguistics,
and Education
Arthur F. Thurnau Professor
College of Literature, Science, and the Arts

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