Approved by the Regents
May 19, 2022

PROMOTION RECOMMENDATION
THE UNIVERSITY OF MICHIGAN
MEDICAL SCHOOL
DEPARTMENT OF BIOLOGICAL CHEMISTRY

Patrick O'Brien, Ph.D., associate professor of biological chemistry, with tenure, Department of Biological Chemistry, Medical School, is recommended for promotion to professor of biological chemistry, with tenure, Department of Biological Chemistry, Medical School.

Academic Record:

Ph.D.	2000	Stanford University
B.S.	1994	Santa Clara University

Professional Record:

2012 - present	Associate Professor of Biological Chemistry, with tenure, University of Michigan
2004 - 2012	Assistant Professor of Biological Chemistry, University of Michigan

Summary of Evaluation:

Teaching: Dr. O'Brien has provided extensive mentoring of 19 graduate students, 32 undergraduate students and two fellows. Outside of his own lab, Dr. O'Brien has served on 56 preliminary examination committees and 90 graduate dissertation committees across numerous University of Michigan graduate programs. Dr. O'Brien has taught in numerous Medical School and graduate school courses. From 2012–2017, he taught in the Musculoskeletal and Foundations of Medicine Modules of the M1 medical curriculum with positive evaluations. A major teaching responsibility has been his role as the course director since 2015, of Biological Chemistry 552, which is required of all dual degree M.D./Ph.D. track students in their first year of medical school. In the Ph.D. program curriculum, Dr. O'Brien has taught in Biological Chemistry 597, Biological Chemistry 528, Chemistry 548, and Chemical Biology 501.

Research: Dr. O'Brien advances the research capabilities of our institution as a rigorous, creative and productive leader in the area of nucleic acid enzymology. His lab uses a broad variety of biochemical and biophysical approaches to study the structure and function of the enzymes involved in base excision repair, direct repair, and DNA break repair pathways. Since his promotion to associate professor, he has expanded his portfolio to collaborate with physicians to characterize mutations associated with primary immune deficiency and to target abnormal DNA repair pathways in cancers, including neuroblastoma and lung cancer. His work is well-cited and since his last promotion he has published 21 peer-reviewed publications in the top journals in his field, including the *Journal of Biological Chemistry* and *Nucleic Acids Research*, for a total of 48 articles. Dr. O'Brien's work has been well-supported by the National Institutes of Health, the National Science Foundation, and other agencies.

Recent and Significant Publications:

Jurkiw TJ, Tumbale PP, Schellenberg MJ, Cunningham-Rundles C, Williams RS O'Brien PJ: LIG1 syndrome mutations remodel a cooperative network of ligand binding interactions to compromise ligation efficiency. *Nucleic Acids Res* 49(3): 1619-1630, 2021.

PM33444456/PMC7897520

Admiraal SJ, Eyler DE, Baldwin MR, Brines EM, Lohans CT, Schofield CJ, O'Brien PJ: Expansion of base excision repair compensates for a lack of DNA repair by oxidative dealkylation in budding yeast. *J Biol Chem* 294(37): 13629-13637, 2019. PM31320474/PMC6746446

Tumbale PP, Jurkiw TJ, Schellenberg MJ, Riccio AA, O'Brien PJ, Williams RS: Two-tiered enforcement of high-fidelity DNA ligation. *Nat Commun* 10(1): 5431, 2019. PM31780661/PMC6882888

Zhang Y and O'Brien PJ: Repair of alkylation damage in eukaryotic chromatin depends on searching ability of alkyladenine DNA glycosylase. *ACS Chem Bio* 10(11): 2606-2615, 2015. PM26317160/PMC4724868

Hedglin M, Zhang Y, O'Brien PJ: Isolating contributions from intersegmental transfer to DNA searching by alkyladenine DNA glycosylase. *J Biol Chem* 288(34): 24550-24559, 2013. PM23839988/PMC3750153

Service: Dr. O'Brien serves as the associate chair of the Department of Biological Chemistry and has chaired numerous departmental committees, including graduate admissions, faculty recruiting, and departmental equipment committees. He contributes at the university level as a member of the operating committees for the Pharmacological Sciences Training Program and the Medical Scientist Training Program. At the national level, Dr. O'Brien provides service and leadership for a broad range of grant reviews, serving ad hoc on Macromolecular Struture and Function A and National Institute of Environmental Health Sciences special emphasis study section panels, as well as currently serving as a standing member of the NIH Molecular Genetics A review panel. Additionally, he has reviewed grants for the American Cancer Society since 2017, serving as the vice chair and subsequently the chair of their DNA mechanisms in cancer study section since 2019. He is regularly engaged in the annual Midwest DNA Repair Symposia and the Midwest Enzyme Chemistry Conferences and was elected the vice chair and chair-elect for the latter meeting. At the international level, Dr. O'Brien reviews for many top journals and has served as a reviewing editor for the *Journal of Biological Chemistry* for many years. He has also evaluated grants for agencies in Israel, Poland, and the United Kingdom.

External Reviewers:
Reviewer A: "Overall, I think Prof. O'Brien's promotion to Full Professor is a 'no-brainer' and in my opinion is overdue. He has maintained a high level of impact publications, and substantial funding from NIH and NSF. O'Brien has strategically used his expertise in kinetics to answer important questions and with appropriate collaborators. This bodes well for his continued ability to make important scientific contributions and maintain funding for his laboratory…Obviously, I am a Patrick O'Brien fan."

Reviewer B: "I unequivocally support his promotion to Professor with tenure…In a lab of over 20 postdocs, Dr. O'Brien was arguably one of the most rigorous and thorough in his approach to science, a level of excellence that he maintains in his work today…Because we share an interest in BER, I have followed Dr. O'Brien's research over the years, and have admired the consistency

in the high quality of his work and his productivity…Dr. O'Brien's research productivity is especially impressive considering his substantial teaching load and service commitments to both the university and the profession. His level of teaching is far and above that required at other medical schools."

Reviewer C: "All in all, Pat's consistent track record of publishing high quality mechanistic studies in top tier journals, his strong grant funding, his excellent track record of training graduate students and postdocs and his large amount of his service to the scientific community would make him a strong candidate for promotion to Professor in my department. He is fully deserving of this promotion."

Reviewer D: "After carefully assessing the provided documentation, I feel that Patrick has clearly demonstrated continued scholarship, productive research, and concrete contributions to the teaching mission of the University since his promotion to Associated [sic] Professor in 2012. I fully support the decision to promote Patrick to the rank of Professor. I am confident that he would be promoted and happily accepted as a colleague at other major research institutions, based on his record of research achievement, his outstanding academic contributions, and his prospects for continued research success…It is notable that Patrick has been quite successful in training future researchers, with several past trainees going on to establish their own independent laboratories."

Reviewer E: "In summary, Dr. O'Brien leads a sustainably funded research group with a history of success and innovation. He is a recognized leader in the DNA repair field, a valuable member of the research community and a dedicated educator. He would have certainly been promoted to full professor at our institution based on his funding, research productivity, international recognition and his teaching and service accomplishments. I have no reservations recommending his promotion. "

Summary of Recommendation:
Dr. O'Brien has made important contributions to the fields of biological chemistry and DNA repair. He is an exceptional mentor in training the next generation of researchers. His service contributions are exemplary. I am pleased to recommend Patrick O'Brien, Ph.D. for promotion to professor of biological chemistry, with tenure, Department of Biological Chemistry, Medical School.

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

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