

PROMOTION RECOMMENDATION
The University of Michigan
College of Engineering
Department of Biomedical Engineering
College of Literature, Science, and the Arts
Department of Biophysics

Approved by the
Regents
May 21, 2015

Michael Mayer, associate professor of biomedical engineering, with tenure, Department of Biomedical Engineering, College of Engineering and Medical School, and associate professor of biophysics, without tenure, Department of Biophysics, College of Literature, Science, and the Arts, is recommended for promotion to professor of biomedical engineering, with tenure, Department of Biomedical Engineering, College of Engineering and Medical School, and professor of biophysics, without tenure, Department of Biophysics, College of Literature, Science, and the Arts.

Academic Degrees:

Ph.D.	2000	Swiss Federal Institute of Technology, Biophysical Chemistry, Lausanne, Switzerland
M.S.	1996	University Braunschweig, Bioengineering, Braunschweig, Germany
B.S.	1992	University Braunschweig, Bioengineering, Braunschweig, Germany

Professional Record:

2012 – present	Associate Professor (without tenure), Department of Biophysics
2009 – present	Associate Professor (with tenure), Department of Biomedical Engineering, University of Michigan
2009 – 2013	Associate Professor (without tenure), Department of Chemical Engineering, University of Michigan
2004 – 2009	Assistant Professor, Department of Chemical Engineering, University of Michigan
2004 – 2009	Assistant Professor, Department of Biomedical Engineering, University of Michigan
2001 – 2003	Post-Doctoral Fellow, Biological Chemistry, Harvard University, Cambridge, MA

Summary of Evaluation:

Teaching: Professor Mayer is highly regarded by his students and is viewed as an excellent educator. He has served for 10 years as the instructor for BiomedE 221 “Biophysical Chemistry & Thermodynamics,” and despite this long tenure his Q1 and Q2 scores for the winter 2014 semester of the class were 4.80 and 4.98, respectively, clearly indicating that his enthusiasm and energy for this class has not waned. Students view Professor Mayer as approachable, caring, and willing to help – qualities we desire in our faculty.

Professor Mayer has graduated eight Ph.D. students (with another three in progress) and 14 master’s degree students. His graduate students appreciate his dedication as a mentor, and a number of factors, such as the number of publications with his students, demonstrate he is highly capable in this area. He is also active with undergraduate education activities as well. His curriculum vitae lists 27 undergraduate major projects directed.

Research: Professor Mayer’s research is centered on the use of multiple biochemical and engineering approaches to modify and control lipid-bilayer nanopores, and the subsequent study of biomolecular interactions of proteins that translocate through these nanopores. He and his students have authored over 60 peer-reviewed manuscripts, several of which have appeared since his last promotion and nearly all as senior author. Apart from simply the number of publications, Professor Mayer has published in top

journals in the field, including *Nature Nanotechnology* and *Proceedings of the National Academy of Sciences* (PNAS).

Professor Mayer has been able to secure significant and continuous funding from NIH, NSF and the Air Force Office of Research (AFOSR), as well as numerous other agencies, foundations (such as the Wallace H. Coulter Foundation), and private industry (Oxford Nanopore Technologies). He is currently the PI on an NIH R01 grant, an AFOSR grant, and a grant from Oxford Nanopore Technologies, with a total of approximately \$5.3 Million (Professor Mayer's share: \$3.2 Million). Furthermore, he has clearly established his national and international reputation as reflected in 20 invited extramural presentations since his last promotion, with 10 of those outside the U.S, and several prestigious awards, including the Miller Faculty Scholar Award (2013-2016) and Monroe-Brown Foundation Research Excellence Award (2010).

Recent and Significant Publications:

- P. Prangkio, E. C. Yusko, D. Sept, J. Yang and M. Mayer, "Multivariate analyses of amyloid-beta oligomer populations indicate a connection between pore formation and cytotoxicity," *PloS One*, 7, e47261, 2012.
- E. C. Yusko, J. M. Johnson, S. Majd, P. Prangkio, R. C. Rollings, J. Li, J. Yang and M. Mayer, "Controlling protein translocation through nanopores with bio-inspired fluid walls," *Nature Nanotechnology*, 6, 253-260, 2011.
- J. D. Uram, K. Ke and M. Mayer, "Noise and bandwidth of current recordings from submicrometer pores and nanopores," *ACS Nano*, 2, 857-872 2008.
- K. S. Horger, D. J. Estes, R. Capone and M. Mayer, "Films of agarose enable rapid formation of giant liposomes in solutions of physiologic ionic strength," *Journal of the American Chemical Society*, 131, 1810-1819, 2009.
- R. Capone, F. G. Quiroz, P. Prangkio, I. Saluja, A. M. Sauer, M. R. Bautista, R. S. Turner, J. Yang and M. Mayer, "Amyloid-beta-induced ion flux in artificial lipid bilayers and neuronal cells: resolving a controversy," *Neurotoxicity Research*, 16, 1-13, 2009.

Service: Professor Mayer has provided service to his department, the college and the larger scientific community. Within the Department of Biomedical Engineering, he has chaired the safety committee, served most recently on the departmental chair search committee, and he has advised students in the Biotechnology track since 2005. Within the University of Michigan, he has served on the Executive Committee of the Microfluidics training grant, and he has been an active reviewer for multiple journals as well as for NSF.

External Reviewers:

Reviewer A: "You have asked me a number of questions about Prof. Mayer's scholarship, international visibility, impact, contribution to his field, entrepreneurship, and ability to select important problems. In all cases, I would state his work rates at the top of the field and is internationally recognized in North America, Asia, as well as Europe. He works at the boundaries between membrane biophysics, sensor design, analytical chemistry, electrophysiology, and materials science. This is an extremely interdisciplinary field of research and Dr. Mayer is at ease with a huge variety of topics."

Reviewer B: "Dr. Mayer has a solid and sustained track record of producing high quality work at the interface of science and engineering. This is the most important factor in being promoted to full professor. His nanopore work, which is one of the most active current areas of work in his lab is innovative and of high impact, and he is establishing himself as one of the leaders in the world in this area."

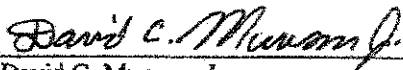
Reviewer C: "As evident from Prof. Mayer's impressive CV he is active in several areas spanning the full breadth of biomedical engineering and even touching aspects of nanopore physics. The scholarly breadth and interdisciplinary mind set are most impressive and clearly show the talents of Prof. Mayer to develop a highly diverse, yet extremely competitive research group."

Reviewer D: "Very clearly, Dr. Mayer has established himself as a major player in molecular bioengineering, and as a scholar who is recognized on the international research arena. To my observation, his standing is at the leading edge of any comparable researcher of his [generation] in the field."

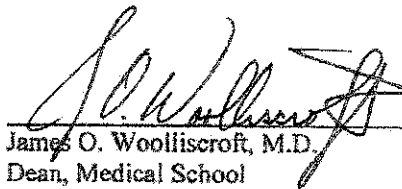
Reviewer E: "I have followed the work of Prof. Mayer for at least 10 years and I have been increasingly impressed with the quality of his research, original ideas as well as breadth of his research interests. Prof. Mayer works in a hot field of nanopores and micropores, which emerged as a promising platform to detect and characterize single molecules such as DNA and proteins as well as gather fundamental knowledge on transport at the nano and microscales. The research is interdisciplinary, and requires working at the interface of bioengineering, biophysics, condensed matter physics, and electrochemistry."

Reviewer F: "Definitively he has a great talent. Moreover he is also gifted to explain complex procedures...open to critics and able to adapt very easily. Among the top 100-200 research groups in the area of nanopores his group is among the best ten...he has a very prominent record of achievements."

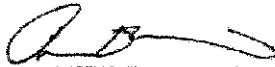
Summary of Recommendation: Professor Mayer is a prominent and internationally recognized researcher, and one of the pioneers in the area of nanopores. He has proven himself as a highly capable teacher and mentor, and he provides valuable service to his department and beyond. It is with the support of the College of Engineering Executive Committee that I recommend Michael Mayer for promotion to professor of biomedical engineering, with tenure, Department of Biomedical Engineering, College of Engineering and Medical School, and professor of biophysics, without tenure, Department of Biophysics, College of Literature, Science, and the Arts.



David C. Munson, Jr.
Robert J. Vlasic Dean of Engineering
College of Engineering



James O. Woolliscroft, M.D.
Dean, Medical School
Lyle C. Roll Professor of Medicine



Andrew D. Martin
Dean, and Professor of Political Science,
College of Literature, Science, and the Arts