

PROMOTION RECOMMENDATION

The University of Michigan  
College of Engineering  
Department of Chemical Engineering  
Department of Biomedical Engineering  
Macromolecular Science and Engineering Program

Omolola Eniola-Adefeso, associate professor of chemical engineering, with tenure, Department of Chemical Engineering, associate professor of macromolecular science and engineering, without tenure, Macromolecular Science and Engineering Program, College of Engineering, and associate professor of biomedical engineering, without tenure, Department of Biomedical Engineering, College of Engineering and Medical School, is recommended for promotion to professor of chemical engineering, with tenure, Department of Chemical Engineering, professor of macromolecular science and engineering, without tenure, Macromolecular Science and Engineering Program, College of Engineering, and professor of biomedical engineering, without tenure, Department of Biomedical Engineering, College of Engineering and Medical School.

Academic Degrees:

Ph.D.	2004	University of Pennsylvania, Chemical Engineering, Philadelphia, PA
M.S.	2000	University of Pennsylvania, Chemical Engineering, Philadelphia, PA
B.S.	1999	University of Maryland Baltimore County, Biochemical and Chemical Engineering, Baltimore, MD

Professional Record:

2016 – present	Associate Professor (without tenure), Macromolecular Science and Engineering Program, University of Michigan
2015 – present	Associate Professor (without tenure), Department of Biomedical Engineering, University of Michigan
2013 – present	Associate Professor (with tenure), Department of Chemical Engineering, University of Michigan
2006 – 2013	Assistant Professor, Department of Chemical Engineering, University of Michigan
2004 – 2006	Post-Doctoral Fellow, Department of Pediatrics/Leukocyte Biology, Baylor College of Medicine, Houston, TX

Summary of Evaluation:

Teaching: Professor Eniola-Adefeso's record in classroom teaching and mentoring is excellent. Over her career at UM, her teaching evaluations average 4.08 (Q1), 4.03 (Q2) and 4.10 (Q4). Many of these classes had very high enrollment (150-200 students), as is typical of required core undergraduate classes in ChE, and these values are similar or better than other instructors in ChE for the same courses. Her teaching has been marked by innovation as evidenced, in part, by her development of a unique classroom project for ChE 342 for which she won the Provost's Teaching Innovation Prize. Her project has been enthusiastically adopted by later instructors and

continues to be used each year. Further, she developed a class on drug delivery now taught by an assistant professor, further demonstrating her ability to bring about lasting, positive change in the curriculum. She has a noted capacity to keep even large classes fully engaged, challenged and learning.

Mentoring is a significant area of contribution for Professor Eniola-Adefeso as over 30 undergraduates have worked in her lab during her time at Michigan, with 13 engaged in major research projects during her time as an associate professor. She has a true passion for promoting undergraduate involvement in research, and as a result many of those students have gone on to graduate study. She has graduated nine Ph.D. students with another seven currently working in her laboratory. In addition, she has trained three post-doctoral fellows and is currently training a fourth. Students credit interaction with her in class, during office hours, or as part of her peer-mentoring program as an experience providing powerful and lasting positive impact.

Research: Professor Eniola-Adefeso is a nationally and internationally recognized leader in the field of targeted drug delivery. Her discoveries have elucidated the roles of size and hemodynamics on target drug carrier efficacy, providing important implications to nano-carriers that have primarily been developed with little or no consideration of the biotransport aspects of the carriers. Her work on fabrication of biodegradable spheroids for drug delivery has also had high impact, providing an elegant method for making elaborate drug-delivery vehicles. Although human blood flow dynamics had been actively studied for years, it was her work that identified the critically important problem of particle (drug carrier) transport within blood flow. Professor Eniola-Adefeso's scholarly output and impact are excellent. From 2013-2016, she published (or has in press) over 15 high-impact journal articles and two book chapters, and she has an additional three manuscripts submitted or under review. All are with her trainees with Professor Eniola-Adefeso as the senior author. Her productivity, already strong, has increased while in her current rank. From 2013-2016, she gave over 20 external invited presentations on research (as well as two focused on mentoring more junior faculty). Furthermore, Professor Eniola-Adefeso's funding record is very strong, despite a difficult funding climate. She has received major funding from NSF, NIH, and the American Heart Association, as well as funding from industry and internal UM awards. Her current funding includes multiple NIH and NSF awards, including a CAREER award. Four major pending proposals with her as the PI mark Professor Eniola-Adefeso's continuing efforts and new research ideas.

#### Recent and Significant Publications:

- Fromen C.A., M.B. Fish, A. Zimmerman, R. Adili, M. Holinstat and O. Eniola-Adefeso (2016), "Evaluation of Receptor-Ligand Mechanisms of Dual-Targeted Particles to an Inflamed Endothelium," *Bioengineering & Translational Medicine*, 1(1): 103-115.
- Namdee, K., M. Carrasco-Teja, P. Charoenphol and O. Eniola-Adefeso (2015), "Exploring the effect of RBC geometry on particle margination in blood flow between human and common animal models of coronary artery disease," *Nature Scientific Reports*, 5:11631.
- Sobczynski, D.J., P. Charoenphol, P. Onyskiw, K. Namdee, A.J. Thompson and O. Eniola-Adefeso, (2014), "Plasma protein adsorption modulates drug carrier vascular wall adhesion," *PLoS One*. 9 (9), e107408.

Thompson, A.J., E.M. Mastria, O. Eniola-Adefeso, “The Margination Propensity of Ellipsoidal Micro/Nanoparticles to the Endothelium in Human Blood Flow,” *Biomaterials*, 2013, 34(23): 5863-71.

Charoenphol, P., R.B. Huang and O. Eniola-Adefeso, “Roles of particle size and hemodynamics on the efficacy of spherical vascular-targeted drug carriers,” *Biomaterials*, 2010, 31(6): 1392-402.

Service: Professor Eniola-Adefeso has made extremely strong contributions in service during her time in rank. In particular, she has worked tirelessly on diversity, equity, and inclusion. In Chemical Engineering, she was a member of the graduate committee from 2008-2016 and served as the graduate program chair from 2014-2016. During her tenure, the diversity of the graduate student population dramatically increased: the entering 2015 Ph.D. class was over 40% women with approximately 25% of the domestic students URM, making it the most diverse class in the history of Chemical Engineering. In her efforts to increase faculty diversity, she has frequently co-chaired our NextProf workshop as well as served as an enthusiastic speaker in the program. Beyond these efforts, she served as the chair of the faculty subcommittee on our strategic plan development for diversity, equity, and inclusion in 2015-2016. The subcommittee’s recommendations built on the work she had done during 2014 as a Faculty Fellow in the college. During 2015-2016, Professor Eniola-Adefeso developed a highly successful Chemical Engineering peer-mentoring program in which third-year Ph.D. students serve as educational and social mentors to a group of five to six first-year Ph.D. students, helping the new students integrate into study groups and find a social life at Michigan. In addition, she has served on the department’s executive committee, the departmental faculty search committee, and the college’s Faculty Council on Discipline.

External Reviewers:

Reviewer A: “Her scholarship is of very high quality, and it continues to be supported by a current NIH R01, a recently concluded R03 grant and an NSF Career Award. Her scholarship appears in published form in very fine scientific journals. ...Lola has other manuscripts in the pipeline that I believe will be equally, if not more, impactful, and there are also numerous grant proposals in review that, if funded, will perpetuate [her] work in exciting new directions. She is creative in carving out her own unique scientific domain in targeted drug delivery.”

Reviewer B: “Lola is without a doubt a rising star who does scholarly work. ...I have read many of Lola’s publications, and I find them to be forward thinking and critically important to her field as they have already been instrumental in charting a new course in targeted drug delivery research.”

Reviewer C: “Prof. Eniola has established a unique research direction in drug delivery. ...Prof. Eniola is unique in her approach and brings a new perspective to the field. The new directions she is pursuing are logical and impactful extensions of her prior work, and demonstrate her ability to conduct competitive, sustained fundable research.”

Reviewer D: “She is among the leading authorities in the field of vascular dynamics of nanoparticles and vascular targeting of nanocarriers. ...Her research on particle margination has generated significant interest in the vascular-targeted drug delivery community, and precipitated

the development of a new wave of sophisticated computational tools for elucidating RBC dynamics in physiological flows and geometries beyond the reach of current experimental systems.”

Reviewer E: “In my expert opinion, she is an internationally recognized leader in the field of drug delivery, and she has made outstanding and impactful scholarship and teaching/mentoring contributions...”

Reviewer F: “Lola has done more than anyone else to help us understand how particulate drug and diagnostic delivery systems interact with the vascular wall.”

Summary of Recommendation: Professor Eniola-Adefeso’s work is highly significant and impactful. Amid a crowded field of vascular-targeted drug carrier researchers, her innovation and wisely selected studies have established her as a world leader. She is on a very strong trajectory and is well positioned for continued productivity and increasing national and international impact. It is with the support of the College of Engineering Executive Committee that I recommend Omolola Eniola-Adefeso for promotion to professor of chemical engineering, with tenure, Department of Chemical Engineering, professor of macromolecular science and engineering, without tenure, Macromolecular Science and Engineering Program, College of Engineering, and professor of biomedical engineering, without tenure, Department of Biomedical Engineering, College of Engineering and Medical School.



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Alec D. Gallimore, Ph.D.  
Robert J. Vlasic Dean of Engineering  
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Marschall S. Runge, M.D., Ph.D.  
Executive Vice President for Medical Affairs  
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