

PROMOTION RECOMMENDATION
The University of Michigan
College of Engineering
Department of Biomedical Engineering

Ariella Shikanov, assistant professor of biomedical engineering, Department of Biomedical Engineering, College of Engineering and Medical School, and assistant professor of macromolecular science and engineering, Macromolecular Science and Engineering Program, College of Engineering, is recommended for promotion to associate professor of biomedical engineering, with tenure, Department of Biomedical Engineering, College of Engineering and Medical School, and associate professor of macromolecular science and engineering, without tenure, Macromolecular Science and Engineering Program, College of Engineering.

Academic Degrees:

Ph.D.	2007	Hebrew University in Jerusalem, Pharmaceutical Sciences, Jerusalem, Israel
B.S.E.	1998	Hebrew University in Jerusalem, Pharmaceutical Sciences, Jerusalem, Israel

Professional Record:

2012 – present	Assistant Professor, Macromolecular Sciences and Engineering Program, University of Michigan
2012 – present	Assistant Professor, Department of Biomedical Engineering, University of Michigan
2007 – 2011	Post-Doctoral Fellow, Chemical and Biological Engineering, Northwestern University, Chicago, IL

Summary of Evaluation:

Teaching: Professor Shikanov has made major contributions to both the undergraduate and graduate programs of Biomedical Engineering, by taking on existing courses (BME 418 – Quantitative Cell Biology, BME 241 – Instrumentation Laboratory, and BME 321 – Bioprocess Engineering), and developing new offerings (BME 474 – Introduction to Tissue Engineering and BME 599 – Biomedical Innovations). She is clearly appreciated and respected by her students. Her Q2 scores have averaged 4.63, including 4.83 over the past two years. She has adopted a variety of interactive and engaged learning techniques that students responded to very favorably, and these techniques enabled her to cover 50% more material. Professor Shikanov also expanded her Tissue Engineering course to include a lab component, an endeavor that is non-trivial and highly valued. Superlative comments in student letters provide further evidence of her teaching excellence.

Professor Shikanov has been active in research mentoring, serving as the chair of six Ph.D. dissertation committees (three have graduated) and a member of 20 other dissertation committees. She has also advised seven M.S. students, four undergraduates and five post-doctoral fellows in her laboratory. She has been particularly dedicated to recruiting, training and mentoring women and underrepresented minorities. Outside of the classroom, she has been involved in several significant outreach activities. She has developed an education program for middle and high school students to introduce them to tissue engineering and reproductive technology. This program has recently been expanded in a partnership with the UM Women in Science and Engineering and the Detroit Area Pre-College and Engineering Program.

Research: Professor Shikanov has established a robust research program that has advanced biomedical engineering in the sub-areas of biomaterials, tissue engineering, and reproductive sciences. Her research program has been highly productive in terms of publications and securing research funding. She has over 35 publications in high-quality peer reviewed journals, including many of the major journals in her sub-

fields, as well as more general scientific and engineering journals. Since starting her lab at UM, she is the senior author driving the work on almost all of her papers. She is currently the PI of eight grants, including an NSF CAREER Award, NIH R01, a second NIH award, and several foundation grants. Professor Shikanov's total current research funding is ~ \$2.5 M and her career total as the PI exceeds \$3.2M.

The focus of Professor Shikanov's laboratory is to engineer strategies that can restore ovarian reproductive and endocrine function in young women and girls with premature ovarian insufficiency. Her group has made significant advances in several research areas, as evidenced from her publications. She is also an inventor on two patents, with two other invention disclosures submitted, further demonstrating the translational potential of her research. Professor Shikanov's national and international visibility is clearly demonstrated by her invited talks at universities and conferences in the U.S. and abroad.

Recent and Significant Publications:

- A. David, J. R. Day, A. L. Cichon, A. Lefferts, M. Cascalho, A. Shikanov, "Restoring ovarian endocrine function with encapsulated ovarian allograft in immune competent mice," *Annals of Biomedical Engineering*, 12/2016.
- J. Claflin, A. David, J. Kim, A. S. Perez, A. Shikanov, H. Zhou, "Synthetic hydrogel supports the function and regeneration of artificial ovarian tissue in mice," *npj Regenerative Medicine*, 07/2016.
- J. Kim, Y. P. Kong, S. M. Niedzielski, R. K. Singh, A. J. Putnam, A. Shikanov, "Characterization of the crosslinking kinetics of multi-arm poly(ethylene glycol) hydrogels formed *via* Michael-type addition," *The Royal Society of Chemistry*, 12/2015.
- A. Arab, M. T. Hill, M. A. Malik, A. Shikanov, H. Zhou, "Hydrogel Based 3-Dimensional (3D) System or Toxicity and High-Throughput (HTP) Analysis for Cultured Murine Ovarian Follicles," *PLOS ONE*. 10/2015.
- R. M. Coleman, M. T. Hill, J. Kim, S. M. Niedzielski, A. Ono, A. Shikanov, B. Wu, "Characterizing natural hydrogel for reconstruction of three-dimensional lymphoid stromal network to model T-cell interactions," *J Biomed Mater Res Part A*, 01/2015.

Service: Professor Shikanov has fulfilled a number of important service roles at the department, college and university-levels, and in the broader professional community. In the department, she has served on the undergraduate education committee, faculty search committees, graduate admission committee, space committee, and has chaired the honors committee. At the college level, she has been a member of the SROP and SURP admissions committees, served on the executive committee of the Microfluidics in Biomedical Sciences Training Program, and has been involved in the annual Graduate Student Symposium. For the university, she has been highly involved in the Reproductive Sciences Program, serving as a reviewer for career training applications and participating on panels dedicated to guiding faculty on work-life balance. She is also on the ObGyn Chair Search Committee and has led workshops in the NextProf Program. In addition to this internal service, Professor Shikanov has rendered extensive service contributions to the broader research community both nationally and internationally, including serving as a grant reviewer for the NSF and granting agencies in Israel and the Netherlands, and organizing and chairing sessions at the Society for Biomaterials, Biomedical Engineering Society and TERMIS annual meetings. She also reviews manuscripts for several journals.

External Reviewers:

Reviewer A: "I consider that Prof. Shikanov has made significant, impactful and creative contributions at a higher level than other candidates at a similar professional stage and I would enthusiastically support granting promotion and tenure at my institution."

Reviewer B: "... Prof. Shikanov is extremely well-prepared and well-positioned to grow as a leader in her field with continued major contributions and impact to engineering and medicine. She has shown a consistent and high level of productivity in terms of research, teaching, and service."

Reviewer C: "She has published a number of very nice papers in the broader field over the past few years, and has been quite successful in obtaining funding for the work in her laboratory – a clear indication that her colleagues recognize the creativity and importance of her work. Her new areas of research described in the future research directions are exciting and likely to yield a number of important advances as well in the coming years."

Reviewer D: "She has wonderful potential for continued creative contributions to the field of biomaterials and reproductive tissue engineering. In short, Dr. Shikanov contributes exceptionally with her outstanding research, mentoring, and service to the field."

Reviewer E: "... Dr. Shikanov has participated in many of the scholarly activities necessary for providing a strong base for a very successful career. In your letter you asked for comparisons between Dr. Shikanov and faculty members at other institutions at similar career stages. I would rank her performance on par with the top scholars in the field at approximately the same stage of their career."

Summary of Recommendation: Professor Shikanov's research has had a significant impact and is of high quality. She is an outstanding mentor and teacher and has performed exemplary service. It is with the support of the College of Engineering Executive Committee that I recommend Ariella Shikanov for promotion to associate professor of biomedical engineering, with tenure, Department of Biomedical Engineering, College of Engineering and Medical School, and associate professor of macromolecular science and engineering, without tenure, Macromolecular Science and Engineering Program, College of Engineering.



Alec D. Gallimore, Ph.D.
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May 2018