

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

Ann L. Miller, assistant professor of molecular, cellular, and developmental biology, College of Literature, Science, and the Arts, is recommended for promotion to associate professor of molecular, cellular, and developmental biology, with tenure, College of Literature, Science, and the Arts.

Academic Degrees:

Ph.D.	2004	Yale University
B.A.	1999	Gustavus Adolphus College

Professional Record:

2011 – present	Assistant Professor, Department of Molecular, Cellular, and Developmental Biology, University of Michigan
2005 – 2011	Post-doctoral Research Fellow, University of Wisconsin, Madison

Summary of Evaluation:

Teaching – Professor Miller is an exceptionally committed and successful educator, who is also a thoughtful and dedicated mentor to student scientists. Her primary teaching assignments have been to co-teach the large enrollment course “Cell Biology” (MCDB 428) and to teach “Cytoskeletal Dynamics” (MCDB 454), which is an advanced course that she developed. Professor Miller played a pivotal role in enhancing the syllabus and teaching materials for Cell Biology, which is a core course in the Cell and Molecular Biology (CMB) major. Professor Miller has co-developed a new 200-level introductory cell biology course with a tenured faculty member in her department that will be offered for the first time in winter 2018. This course is intended to build on topics covered in introductory biology and to provide students with a solid foundation in fundamental concepts in cell and molecular biology. Professor Miller’s dedication to her classroom teaching is evidenced by peer experience in the classroom and the positive student responses to her teaching style and methods as evidenced by outstanding E&E scores. She is recognized as an exceptional mentor to the trainees in her laboratory. Professor Miller has also engaged in significant educational outreach activities, including participation in the Females Excelling More in Math, Engineering and the Sciences for preteen girls, the Developing Future Biologists Program to support undergraduate students from under-represented groups, and in developing outreach materials for UM’s Museum of Natural History.

Research – Professor Miller’s research addresses the molecular mechanisms that underlie the formation of an animal tissue called epithelium. Epithelial tissues form a barrier between the inside and the outside of the body (e.g., the lining of the gut and lungs, etc.) and they also play essential roles in transporting molecules into and out of the body. Professor Miller studies how these tissues form different kinds of stable, cell-to-cell junctions to allow them to perform their functions. She has established a well-funded, productive, and independent research program at Michigan. Her study of the molecular mechanisms that regulate assembly of cell-cell junctions in epithelial tissues *in vivo* is an important and timely topic, and her group has made several significant advances in this research field. She is cited by multiple external reviewers as a rising star in the field, and the trajectory of her research indicates that she will continue to make

exciting contributions in this area of research in the future.

Recent and Significant Publications:

“MgcRacGAP’s SxIP motif tethers Centralspindlin to microtubule plus ends in *Xenopus laevis*,” with E. B. Breznau, et al., *Journal of Cell Science*, 130, 2017, pp. 1809-1821.

“Maintenance of the epithelial barrier and remodeling of cell-cell junctions during cytokinesis,” with T. Higashi, et al., *Current Biology*, 26, 2016, pp. 1829-1842.

“MgcRacGAP restricts active RhoA at the cytokinetic furrow and both RhoA and Rac1 at cell-cell junctions in epithelial cells,” with E. G. Breznau, et al., *Molecular Biology of the Cell*, 26, 2015, pp. 2439-2455.

“Anillin regulates cell-cell junction integrity by organizing junctional accumulation of Rho-GTP and Actomyosin,” with C. C. Reyes, et al., *Current Biology*, 24, 2014, pp. 1263-1270.

Service – Both the quality and quantity of Professor Miller’s service to the Department of Molecular, Cellular, and Developmental Biology and to the University of Michigan has been exemplary. She served two terms on the Graduate Admissions Committee and she has participated in a faculty search committee. She is a highly sought after member of Ph.D. and M.S. thesis committees. Professor Miller has also served on the Ph.D. Admissions Committee and the Program Committee of the interdepartmental CMB graduate program. Notably, she recently received a faculty service award from the CMB program. Professor Miller has also led eighteen workshops for graduate students and post-doctoral fellows that focus on career development, demonstrating her exceptionally strong commitment to developing and supporting the next generation of scientists.

External Reviews:

Reviewer (A)

“Through her work as a student and post-doc and as a group leader, Ann Miller has made a name for herself as a leader in the field of cytokinesis. ... As a consequence, the body of work she has generated over the last few years has made a significant contribution to our understanding of cell division. ... This was recognised by her being profiled in JCB and in her being asked to chair a Gordon conference meeting on adhesion receptor signalling and a session at ASCB.”

Reviewer (B)

“...Ann is a first rate researcher, mentor, and scientific citizen, and thus has all of the attributes one desires in a colleague. ...Ann’s trajectory is such that it will be only a matter of a few years before she has surpassed her graduate and postdoctoral mentors.”

Reviewer (C)

“In Ann Miller, you have a rising star. ... She has rapidly established herself and her research group as a leader in the field. ... In the few years that Ann Miller has had an independent research lab she has published an impressive body of work that is gaining her national and international attention in the field. ... she has successfully won external funding for her research. Of particular note, she has successfully won an R01 NIH grant, which in the current climate is a major achievement.”

Reviewer (D)

“My overall opinion is that Ann is an exceptionally bright and capable scientist who has become

an important figure in the field of epithelial cell biology. ... Ann's laboratory is on an excellent trajectory, and I look forward to seeing how her research continues to transform our understanding of epithelial cell biology."

Reviewer (E)

"Dr. Miller really stands alone among her [cohort] for the rigor of her work and the discoveries she is making. ... She is a world-class scholar who is emerging as a major leader in her field. As you know, she is an excellent colleague and has great leadership skills."

Reviewer (F)

"In terms of quality, I rate Dr. Miller's papers very high. Her imaging is exquisite, and she regularly analyzes and quantifies dynamics that occur in the z-axis of the microscopy, which is difficult, but very important for epithelial biology. Her molecular analysis is also very careful and thorough. I also find her work quite original."

Reviewer (G)

"Dr. Miller's research record is, simply put, outstanding. ... Ann is a world leader in applying genetic and cell biological, and computational tools to study animal development, with a focus on cytokinesis, and her extremely creative, multidisciplinary approach has had a major impact in this field in particular, and at the juncture between cell and developmental biology more generally. This is remarkable [in her cohort]...and is a real tribute to her abilities and personality."

Reviewer (H)

"Her work is so interesting that my laboratory journal club has discussed virtually every paper that has emerged from her independent laboratory. ... Miller has excellent taste in scientific questions. She is a creative experimentalist with high standards for rigorous, thorough work."

Summary of Recommendation:

Professor Miller has made important discoveries in her research that have uncovered fundamental mechanisms by which cells establish junctions to form the epithelium. She has demonstrated an outstanding commitment to teaching and service. The Executive Committee of the College of Literature, Science, and the Arts and I recommend that Assistant Professor Ann L. Miller be promoted to the rank of associate professor of molecular, cellular, and developmental biology, with tenure, College of Literature, Science, and the Arts.



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

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