

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

Sara J. Aton, 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. 2006 Washington University, St. Louis  
B.S. 2001 University of Michigan

Professional Record:

2012 – present Assistant Professor, Department of Molecular, Cellular, and Developmental Biology (MCDB), University of Michigan  
2006 – 2012 Post-doctoral Fellow, University of Pennsylvania

Summary of Evaluation:

Teaching – Professor Aton is an effective, thoughtful, and dedicated educator and mentor to her students and her trainees. Her primary teaching assignments have been to co-teach the large enrollment courses MCDB 352 (Neurobiology of Sensory and Motor Systems) and BIO 222 (Principles of Cellular and Molecular Neuroscience), and to teach all of the course MCDB 401/459 (Brain States and Behavior) that she developed. She has played a key role in developing the syllabus and teaching materials for MCDB 352 and BIO 222. Students and her peers consider Professor Aton to be a very successful teacher. She is also an outstanding mentor for the students in her research laboratory, where she has trained many doctoral students, post-doctoral fellows, and undergraduate students.

Research – Professor Aton is a systems neuroscientist, who is considered to be a rising star in the field of sleep neuroscience and memory consolidation. Her major contributions from research conducted at Michigan are the experimental demonstrations of the fundamental role that sleep plays in the formation of memories. She has pushed the boundaries of knowledge in the field by using cutting-edge research methods like optogenetics and electrophysiological recordings in living mice. Her findings have already had far-reaching impact, as was highlighted and discussed by the external reviewers, who considered Professor Aton to be a rising star in the field of sleep neuroscience and brain plasticity.

Recent and Significant Publications:

“Hippocampal network oscillations drive memory consolidation in the absence of sleep,” with N. Ognjanovski, et al., *Cerebral Cortex*, 2018, DOI: 10.1093/cercor/bhy174.  
“Sleep promotes, and sleep loss inhibits, selective changes in firing rate, response properties, and functional connectivity of primary visual cortex neurons,” with B. C. Clawson, et al., *Frontiers in Systems Neuroscience*, 12, 2018, 40 DOI: 10.3389/fnsys.2018.00040.

“Thalamocortical oscillations in NREM sleep play an essential, instructive role in visual system plasticity,” with J. M. Durkin, et al., *Proceedings of the National Academy of Sciences*, 114, 2017, pp. 10485-10490, DOI: 10.1073/pnas.1710613114.

“Parvalbumin – expressing interneurons coordinate hippocampal network dynamics required for memory consolidation,” with N. Ognjanovski, et al., *Nature Communications*, 8, 2017, p. 15039, DOI: 10.1038/ncomms15039.

Service – Professor Aton’s service to the department, university, and the broader scientific community has been exceptional. She has served on several important departmental committees, including the Graduate Admissions Committee, Undergraduate Program in Neuroscience Curriculum Committee, MCDB Curriculum Committee, and two faculty search committees. She has served on several committees across the university, and most recently she was appointed as an associate director of the Graduate Program in Neuroscience, responsible for curriculum. She has also done numerous outreach activities, including faculty advisor for Females Excelling More in Mathematics, Engineering, and Science (FEMMES). She is on the editorial boards of *Frontiers in Neuroscience*, *Journal of Neuroscience Methods*, and *Sleep*, and she has served as an ad hoc reviewer for scientific funding agencies, including the National Institutes of Health and the National Science Foundation. Her recent election to the Board of Directors of the Sleep Research Society is a major accomplishment that recognizes her importance to the field.

#### External Reviews:

##### Reviewer (A)

“...believe that her record of scholarly productivity and her future promise are outstanding. She has established herself as an upcoming leader in a field that is growing very rapidly. ... Dr. Aton’s work is of high quality and sophistication and I am confident that she is having and will continue to have a profound impact on the field. For these reasons, I believe that she will quickly become a (if not the) leader among her cohort and will be closely identified with many of the key breakthroughs in the domain of sleep and neuroplasticity.”

##### Reviewer (B)

“...the combination of her paradigm-shifting views and the use of up-to-date methodologies has put her at the forefront in her field of interest. ...Dr[.] Aton’s outstanding scientific achievements, excellent future research programme, solid current grant support and superb teaching accomplishments makes me very confident that she fully deserves promotion to Associate Professor with tenure.”

##### Reviewer (C)

“Dr. Aton is clearly a rising star in the field of sleep research. ... She has emerged as a thought-leader in this area of research and is, given [her] career stage, without peer. ...suffice it to say that Dr. Aton has demonstrated remarkable creativity, perseverance and resourcefulness, all of which are characteristics that I am confident will continue to serve her in excellent professional stead.”

##### Reviewer (D)

“I think that the fact that she has been nominated and elected to serve on the board of directors of the prominent research society in her field indicates her excellent reputation in the field... All of

Dr. Aton's papers are impressive not only for the originality and quality of the research results, but for the beautiful, sophisticated, and rigorous ways that she treats and displays her results. These papers are a treat to read."

Reviewer (E)

"...she has received numerous prestigious awards. She is well-funded, which is always a challenge in these tough funding times. Most importantly, though, she has published 27 papers, many in highly-respected journals and she is corresponding or last author on many of these. This is a great track record."

Reviewer (F)

"...Dr. Aton is an outstanding scientist, scholar, and leader in the field. I support her promotion to the level of associate professor... Dr. Aton has accomplished much in the brief few years she has been on faculty at Michigan. Her experiments have elegantly probed and manipulated underlying physiology during specific sleep stages and defined their relationship to synaptic plasticity."

Reviewer (G)

"She has an impressive command of modern genetic and molecular techniques and is using them effectively to study a fascinating problem. ... I am enthusiastic about Dr. Sara Aton's research and highly recommend her promotion to Associate Professor with tenure in the Department of Molecular, Cellular and Developmental Biology at the University of Michigan."

Summary of Recommendation:

Professor Aton has made important discoveries in her research that have uncovered fundamental mechanisms by which sleep promotes memory formation. She has also 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 Sara J. Aton 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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Elizabeth R. Cole, Interim Dean  
Professor of Women's Studies, Psychology,  
and Afroamerican and African Studies  
College of Literature, Science, and the Arts

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