

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

Bo Duan, 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.	2007	University of Science and Technology of China
B.S.	2002	University of Science and Technology of China

Professional Record:

2016-present	Assistant Professor, Department of Molecular, Cellular and Developmental Biology, University of Michigan
2010-2016	Post-doctoral Fellow, Harvard Medical School
2008-2010	Post-doctoral Fellow, University of Science and Technology of China

Summary of Evaluation:

Teaching: Professor Duan has been an important contributor to the educational mission of MCDB, especially the popular neuroscience major. Since joining the UM faculty, he has taught in five courses, including two large-enrollment courses that are central to the neuroscience curriculum. He was instrumental in redesigning Biology 222 (Principles of Cellular and Molecular Neuroscience) into MCDB 322. Professor Duan has also developed a popular upper-level course for senior undergraduates (MCDB 463: Sensory Circuits and Diseases) that teaches students to critically evaluate primary research papers. He taught a module of an important graduate course (Neuroscience 525: Neurobiology of Pain) and he has also participated in a team-taught graduate-level course (MCDB 614: Experimental Models in MCDB). In addition, Professor Duan has mentored over thirty undergraduate researchers in his laboratory, several of whom wrote honors theses on their research.

Research: Professor Duan is a neuroscientist studying how mammals perceive diverse stimuli. While a post-doctoral fellow at Harvard Medical School, Professor Duan developed a method to genetically mark specific neurons in the peripheral nervous system of mice, which allowed him to identify sensory neurons that sense pain. In his own lab, he has extended his studies to identify neurons that perceive mechanical and chemical itch. In addition, his group has identified specific molecules expressed in these neurons that may underlie chronic itching in humans. More recently, his lab has identified neuronal circuits that mediate the sensation of coolness. His research program combines genetic, molecular genetic, and sophisticated behavioral assays to provide unique insights into the neurobiology of sensation. He has also established productive collaborations with researchers at the University of Michigan and other institutions. He is a dedicated mentor to his trainees, and together they have established a nationally recognized research program.

#### Recent and Significant Publications:

- Lee, H., Graham, R., Melikyan, D., Smith, B., Mirzakhali, E., Lempka, S., & Duan, B. (2022). Molecular determinants of mechanical itch sensitization in chronic itch. *Frontiers in Molecular Neuroscience*, *15*, 937890.
- Fatima, M., Slade, H., Horwitz, L., Shi, A., Liu, J., McKinstry, D., Villani, T., Xu, H., & Duan, B. (2022). Abnormal somatosensory behaviors associated with a gain-of-function mutation in TRPV3 channels. *Frontiers in Molecular Neuroscience*, *14*, 790435.
- Pan, H., Fatima, M., Li, A., Lee, H., Cai, W., Horwitz, L., Hor, C.C., Zaher, N., Cin, M., Slade, H., Huang, T., Xu, X.Z.S., & Duan, B. (2019). Identification of a spinal circuit for mechanical and persistent spontaneous itch. *Neuron*, *103*(6), 1135-1149.
- Fatima, M., Ren, X., Pan, H., Slade, H., Asmar, A., Xiong, C., Shi, A., Xiong, E., Wang, L., & Duan, B. (2019). Spinal somatostatin-positive interneurons transmit chemical itch. *Pain*, *160*(5), 1166-1174.

Service: Professor Duan has an exceptional record of service within MCDB. He has served on the Graduate Admissions Committee for several years and is currently a member of the faculty search committee for 2022. He is also currently an elected member of MCDB's Executive Committee and has organized neuroscience journal clubs as well as co-organizing the MCDB Connell Symposium in 2019 to celebrate MCDB's move to the Biological Sciences Building. Beyond UM, Professor Duan is an associate editor for *Frontiers in Molecular Neuroscience* and has served as a reviewer for many scientific journals. He has also served on multiple grant panels, including the NIH and Wellcome Trust.

#### External Reviewers:

Reviewer (A): "The *Neuron* paper is of significant note as it beautifully integrated a host of techniques to characterize the spinal cord circuits through which itch is generated. Our laboratory reviewed this paper in our journal club; it is an outstanding contribution."

Reviewer (B): "Dr. Duan is a highly motivated, positive, focused and driven scientist. His work demonstrates his creative and fearless approach to his science, and a mature and wide perspective of neuroscience."

Reviewer (C): "Dr. Duan is a highly original researcher with an outstanding record in publications and funding, education, and institutional services. "

Reviewer (D): "In summary, Dr. Duan is a very talented investigator and a rising star in his research field. His work has generated high impact in sensory biology and neuroscience. Especially, his contributions to neurocircuits of itch, pain, and cold/cool, are very significant and relevant to public health."

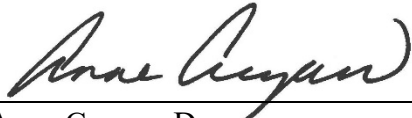
Reviewer (E): "That Dr. Duan has exceeded expectations for promotion to the tenured Associate Professor rank is evident by the accomplishments outlined in his CV."

Reviewer (F): "I am very confident about Dr. Duan's future success because of the clever way he combines genetic tools, electrophysiology, optogenetics and behavior. As a result, he is

optimally positioned to provide new insight into the neural circuits in the dorsal horn that integrate itch, touch, pain and temperature.”

Summary of Recommendation:

Professor Duan has made foundational discoveries elucidating the neuronal circuits that control mechanical and chemically-induced itch. He has made progress to his ultimate goal of identifying the molecules controlling these circuits, which would be targets for intervention in individuals with chronic itch disorders. His well-funded research program is on an upward trajectory and is well positioned to make additional discoveries in the area of sensory neuroscience. Professor Duan is a dedicated educator and has an impressive record of mentoring undergraduate and graduate students, as well as post-doctoral trainees. He is an excellent citizen in his home department, and has commendable service at the national/international level. The Executive Committee of the College of Literature, Science, and the Arts and I recommend that Assistant Professor Bo Duan 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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Anne Curzan, Dean  
Geneva Smitherman Collegiate Professor of  
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