

Approved by the
Regents
May 15, 2014

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

Catherine A. Collins, 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.	2000	University of California, San Francisco
B.S.	1993	Bard College

Professional Record:

2008 – present	Assistant Professor, Department of Molecular, Cellular, and Developmental Biology, University of Michigan
2001 – 2007	Post-doctoral Fellow, Department of Developmental Biology, Washington University School of Medicine

Summary of Evaluation:

Teaching – Professor Collins is a dedicated teacher and mentor who has done a significant amount of work with undergraduate students. Students at all levels praise the stimulating research environment that her laboratory provides and comment favorably on her approachability, encouragement to think independently, and guidance in improving scientific skills. She regularly teaches a large enrollment class that she was instrumental in reorganizing and renaming. It is a key component of the neuroscience curriculum. She also created a smaller enrollment specialty topic for majors. In both contexts, Professor Collins has been especially effective at introducing primary literature reading (in place of textbooks) and integrating active learning techniques. She has also been an exceptional mentor working with undergraduate, graduate, and post-doctoral students in her research laboratory.

Research – Professor Collins’s research program deals with molecular mechanisms of neuronal development, degeneration, and regeneration, which she is probing with a powerful genetic model, the fruit fly *Drosophila melanogaster*. Her publications have appeared in the flagship journals for the American Society of Cell Biology and the Society for Neuroscience. Her 2010 paper (Xiong, et al., *Journal of Cell Biology*) has already received an impressive number of citations and her 2012 paper (Xiong, et al., *PLOS Biology*) demonstrates a remarkable new discovery with potential pharmacological significance in developing treatments for neurological diseases. Professor Collins has also been highly successful at obtaining research funding from the National Institutes of Health and the National Science Foundation.

Recent and Significant Publications:

“Protein turnover of the Wallenda/DLK kinase regulates a retrograde response to axonal injury,” with X. Xiong, et al., *Journal of Cell Biology*, 191, 2010, pp. 211-223.

“A conditioning lesion protects axons from degeneration via the Wallenda/DLK MAP Kinase signaling cascade,” with X. Xiong, *Journal of Neuroscience*, 32(2), 2012, pp. 610-615.

“The highwire ubiquitin ligase promotes axonal degeneration by tuning levels of Nmnat protein,” with X. Xiong, et al., *PLoS Biology*, 10(12), 2012, e1001440.

“Independent pathways downstream of the Wnd/DLK kinase regulate synaptic structure, axonal transport, and injury signaling,” with S. Klinedinst, et al., *Journal of Neuroscience*, 33(31), 2013, pp. 12764-78.

Service – Professor has provided valuable service in her department and to the university through her work on the Graduate Admissions Committees for the department, for the Program in Biomedical Sciences (PIBS), and for the Neuroscience Graduate Program. She was elected to a two-year term of service on the departmental executive committee. Professor Collins has also served as a panelist for the National Science Foundation reviewing grants.

External Reviewers:

Reviewer (A)

“Dr. Collins managed in a relatively short time to build up a very exciting and very creative line of research in her own lab: To decipher the molecular program underlying axon degeneration and regeneration. ...[her] findings are regarded as major achievements in the field.”

Reviewer (B)

“She is not only one of the top couple of *Drosophila* neurobiologists at her career stage, but also a clear leader in the field of axonal injury. Cathy has already published two of the most significant papers in the area of the molecular mechanisms of axonal degeneration. Her 2010 *JCB* paper is one of the most cited in the field...”

Reviewer (C)

“This is a remarkable record of productivity by any measure and especially so in this field where one good paper a year would be considered a very solid achievement. ... Of even greater significance is the fact that beginning with her first publication from Michigan, Dr. Collins has initiated an original and exciting new area of investigation, using the larval nervous system to study mechanisms of axonal degeneration and regeneration following nerve crush injury.”

Reviewer (D)

“She is an experienced *Drosophila* neurobiologist and takes advantage of both the genetic power of the system and the ability to use advanced imaging on fly larvae to obtain quantitative read-outs of molecular, cellular and organismal phenotype. Altogether this is a very forward-looking, integrative approach to neurobiology, and Catherine has already proven to be a major contributor and innovator.”

Reviewer (E)

“It is also important to mention that the highwire pathway is conserved from flies to mammals. Therefore, Dr. Collins’ extension of this work into the area of neuronal regeneration has exciting and significant ramifications. ... The link established here by the Collins group between fly and mouse neuronal degeneration is extremely significant, and it holds real promise for progress in the area of promoting neuronal regeneration following injury or disease.”

Reviewer (F)

“Among her peers, at a similar career stage, she is a standout. ... Part of what sets Dr. Collins apart is that she established a very effective system for generating axon injuries in fly larvae and has exploited this to look at both sides of the injury. ... I have consistently found her work to be very strong and very interesting. It seems she has done a remarkably good job of setting up an independent and productive laboratory.”

Summary of Recommendation:

Professor Collins has made significant research discoveries that hold much promise. She has also demonstrated an exceptional commitment to teaching and service. The Executive Committee of the College of Literature, Science, and the Arts and I recommend that Assistant Professor Catherine A. Collins be promoted to the rank of associate professor of molecular, cellular, and developmental biology, with tenure, College of Literature, Science, and the Arts.



Susan A. Gelman
Heinz Werner Distinguished University Professor,
Professor of Psychology and Interim Dean,
College of Literature, Science, and the Arts

May 2014