

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

Amy Chang, associate professor of molecular, cellular, and developmental biology, with tenure, College of Literature, Science, and the Arts, is recommended for promotion to professor of molecular, cellular, and developmental biology, with tenure, College of Literature, Science, and the Arts.

Academic Degrees:

Ph.D.	1986	Yale University School of Medicine
A.B.	1981	Harvard-Radcliffe College

Professional Record:

2003–present	Associate Professor, Department of Molecular, Cellular, and Developmental Biology, University of Michigan
2001–2003	Associate Professor, Department of Anatomy and Structural Biology, Albert Einstein College of Medicine (secondary appointment) Department of Developmental and Molecular Biology, Albert Einstein College of Medicine
1995–2001	Assistant Professor, Department of Anatomy and Structural Biology, Albert Einstein College of Medicine (secondary appointment) Department of Developmental and Molecular Biology, Albert Einstein College of Medicine

Summary of Evaluation:

Teaching: Professor Chang has made numerous contributions to the teaching mission of the Department of Molecular, Cellular, and Developmental Biology (MCDB). While in rank, she has taught in a wide variety of undergraduate- and graduate-level courses, seven in total. These include our large enrollment introductory biology course (Biology 172) and upper-level courses in Cell Biology (MCDB 428) and Intracellular Trafficking (MCDB 435). Professor Chang has also taught a first-year seminar (Biology 120 – Protein Misfolding) and a course for upper-level undergraduates who are teaching as UTAs (Undergraduate Teaching Assistants; MCDB 412). At the graduate level, she has taught a seminar course (MCDB 800) for master's and beginning doctoral students. Recently, she has been teaching an innovative introductory laboratory course (Biology 173) as part of the Authentic Research Connection, where she leads students through a project related to her own research. In her laboratory, she has trained many undergraduate researchers, several of whom have written honors theses and have been authors on peer-reviewed research papers. At all these various levels, Professor Chang's commitment to teaching is evident.

Research: Professor Chang is a cell biologist and an expert in the study of protein folding and response to stress in the endoplasmic reticulum (ER). Her research uses the brewer's/baker's yeast *Saccharomyces cerevisiae* as a model for ER function, which is highly conserved from fungi to mammals. While in rank, her laboratory has made several discoveries in the area of ER stress (when the ability of the ER to promote proper protein folding is disrupted). These include

finding an unexpected connection between the rate of sphingolipid biosynthesis and ER stress, and her recent discovery that cells respond to ER stress by adjusting the metabolic rate of their mitochondria. She has extended these findings to mammalian cells and this research has the potential one day to lead to treatments for conditions such as diabetes, asthma, and neurodegenerative diseases. Her federally-funded research program is poised to continue to make important advances in ER stress biology in the future.

Recent and Significant Publications:

Knupp, J., Arvan, P., and Chang, A. (2018). Increased mitochondrial respiration promotes survival from endoplasmic reticulum stress. *Cell Death and Differentiation*, 26(3), 487-501. doi: 10.1038/s41418-018-0133-4.

Knupp, J., Martínez-Montañés, F., Van Den Bergh, F., Cottier, S., Schneiter, R., Beard, D., and Chang, A. (2017). Sphingolipid accumulation causes mitochondrial dysregulation and cell death. *Cell Death and Differentiation*, 24(12), 2044-2053. doi: 10.1038/cdd.2017.128.

Liu, M., Huang, C., Polu, S.R., Schneiter, R., and Chang, A. (2012). Regulation of sphingolipid synthesis through Orm1 and Orm2 in yeast. *Journal of Cell Science*, 15; 125(Pt 10), 2428-2435. doi: 10.1242/jcs.100578.

Han, S., Lone, M.A., Schneiter, R., and Chang, A. (2010). Orm1 and Orm2 are conserved endoplasmic reticulum membrane proteins regulation lipid homeostasis and protein quality control. *Proceedings of the National Academy of Sciences USA*, 107(13), 5851-5856. doi: 10.1073/pnas.0911617107.

Service: While in rank, Professor Chang's service in MCDB includes a substantial time on MCDB's Graduate Admissions Committee, which she currently co-chairs. She has also served on the MCDB's executive committee. At the university level, she has served on the admissions committee for the Cell and Molecular Biology (CMB) graduate program, and has been heavily involved with the Protein Folding Diseases Initiative, recently chairing the organizing committee for a 2019 Symposium. She was elected to the LSA Curriculum Committee in 2013. At the national level, she has served on several grant panels.

External Reviewers:

Reviewer (A): "... Dr. Chang has maintained an active and focused research program over the years since receiving tenure, publishing in substantial, well-respected journals."

Reviewer (B): "[Professor Chang] is quiet and deep-thinking—not one who seeks out the spotlight. Nevertheless, her work, published in top-tier journals ... clearly has made a substantial impact."

Reviewer (C): "Some of Dr. Chang's most influential work has been on linking ER protein homeostasis to sphingolipids, such as her discovery of the serine palmitoyltransferase inhibitors ORM1 and ORM2 ... (this) paper is often cited and regarded as important work."

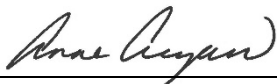
Reviewer (D): “I have always been impressed by the consistently high quality and conceptual innovation of [Professor Chang’s] work throughout her career ... she has produced a number of papers that have had a significant impact on our understanding of the interplay of ER stress and lipid metabolism on protein trafficking, and, more recently, mitochondrial function.”

Reviewer (E): “...her work is moving in the exciting new direction of mitochondrial remodeling in response to unfolded protein stress, based on a high profile publication in Cell Death & Differentiation. As such, her promotion to full professor cannot come a moment too soon.”

Reviewer (F): “In my view Dr. Chang’s work as a molecular cell biologist has been a major contribution to the fields of membrane protein trafficking and quality control and has produced a pivotal discovery in the regulation and function of sphingolipids.”

Summary of Recommendation:

Professor Chang is a leader in the areas of yeast cell biology, quality control, and stress response in the endoplasmic reticulum. Her work demonstrating connections between lipid biosynthesis and mitochondrial function with ER stress are considered fundamental advances in these fields. Her contributions to MCDB’s teaching mission are extensive, teaching a variety of undergraduate and graduate courses and contributing to an innovative laboratory course which exposes underclass students to authentic research. She has also made positive contributions with her service to the department, university, and wider academic community. The Executive Committee of the College of Literature, Science, and the Arts and I recommend that Associate Professor Amy Chang be promoted to professor of molecular, cellular, and developmental biology, with tenure, College of Literature, Science, and the Arts.



Anne Curzan, Dean
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