

PROMOTION RECOMMENDATION
UNIVERSITY OF MICHIGAN
MEDICAL SCHOOL
DEPARTMENT OF CELL AND DEVELOPMENTAL BIOLOGY

Billy Tsai, Ph.D., associate professor of cell and developmental biology, with tenure, Department of Cell and Developmental Biology, Medical School, is recommended for promotion to professor of cell and developmental biology, with tenure, Department of Cell and Developmental Biology, Medical School.

Academic Degrees:

Ph.D.	1999	Harvard University
M.S.	1994	University of California-Los Angeles
B.S.	1993	University of California-Los Angeles

Professional Record:

2008-present	Associate Professor of Cell and Developmental Biology, University of Michigan
2003-2008	Assistant Professor of Cell and Developmental Biology, University of Michigan

Summary of Evaluation:

Teaching: Dr. Tsai is heavily invested in teaching. Dr. Tsai has taught in the required PIBS (Program in Biomedical Science) graduate cell biology course (CDB 530) for several years, and currently serves as its course director. Moreover, he has been teaching medical histology and dental histology since he joined our faculty. In addition to Dr. Tsai's classroom instruction, he is very involved in teaching in his laboratory. He provides superb guidance as well as hands on experience to post-doctoral fellows, graduate and undergraduate students as well as research technicians. He is currently mentoring four post-doctoral fellows. He has mentored seven graduate students (five have completed their Ph.D. degrees and two are currently in his laboratory). Two of his students were awarded very prestigious, competitive pre-doctoral fellowships, one from the NSF. The other student received a Rackham Merit Fellowship. Dr. Tsai has served or continues to serve on 24 graduate dissertation committees (including the seven students from his laboratory). In addition, he served on eighteen Ph.D. candidacy examination committees.

Research: The central theme of Dr. Tsai's research is to determine the mechanisms that enable a specific subset of virus and toxins to enter cells. The viruses and toxins of interest co-opt the cellular endocytic machinery, get into the endoplasmic reticulum, and from their escape into the cytoplasm. The escape entails gaining access to a mechanism that is normally used by cells to clear damaged proteins. It is this last step that is the focus of his research. These are critical questions for understanding the general biology of cells. Moreover, these studies have the potential to provide new therapies to prevent or treat a wide class of human diseases. Based on

the work outlined above, Dr. Tsai has published in many important journals including *Journal of Virology* and *PloS Pathogen*. He is sought after as a speaker at international and national conferences as well as public and private academic institutions.

Recent and Significant Publications:

Qian M, Cai D, Verhey KJ, Tsai B: A lipid receptor sorts polyomavirus from the endolysosome to the endoplasmic reticulum to cause infection. *PloS Pathog* 5 e1000465, 2009.

Bernardi KM, Williams JM, Kikkert M, van Voorden S, Wiertz EJ, Ye Y, Tsai B: E3 ubiquitin ligases Hrd1 and gp78 bind to and promote cholera toxin retro-translocation. *Mol Biol Cell* 21: 140-151, 2010.

Moore P, Bernardi KM, Tsai B: Ero1a-PDI redox cycle regulates retro-translocation of cholera toxin. *Mol Biol Cell* 21:1305-1313, 2010.

Walczak CP, Tsai B: A PDI family network acts distinctly and coordinately with ERp29 to facilitate polyomavirus infection *J Virology* 85:2386-2396, 2011.

Inoue T, Tsai B: A large and intact viral particle penetrates the endoplasmic reticulum membrane to reach the cytosol. *PloS Pathogen* 7 e1002037, 2011.

Service: Dr. Tsai is extensively involved in departmental service. He has served on the departmental graduate recruitment and admissions committees, and is an active participant in several interdisciplinary training programs including the CMB training program. Most recently he has been active in development for the department and for the Medical School. He has served as an ad hoc reviewer for two NIH study sections. He also serves as a reviewer for several prestigious journals, including *Nature*, *Journal of Cell Biology*, *Journal of Cell Science* and *Journal of Virology*.

External Reviewers:

Reviewer A: “Dr. Tsai is richly deserving of promotion to Professor of Cell and Developmental Biology with tenure at the University of Michigan Medical School. He is a gifted scientist and has made important contributions to an understanding of the cell biology of pathogen uptake. His work has influenced multiple fields and is highly significant. Moreover, he is on a research trajectory to make even more important contributions in the future.”

Reviewer B: “Billy Tsai studies cell entry of viruses and toxins that penetrate into the cytosol through the membrane of the endoplasmic reticulum (ER). In so doing, he has found previously unknown properties of the ER and characterized several ER enzymatic activities critical for translocation of viruses and toxins. The work is thus a valuable and widely recognized contribution both to fundamental cell biology and to our understanding of viral and bacterial pathogenesis.”

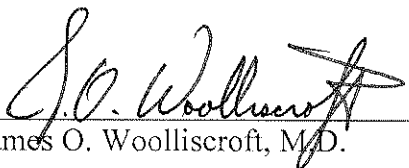
Reviewer C: “Dr. Tsai is well funded with two RO1 awards from the NIH and a Burroughs Wellcome grant. He serves on [the] VIRB study section as a permanent member. He reviews for high profile journals. He has several graduate students in his laboratory and two post-doctoral fellows.”

Reviewer D: “...Billy has served on several NIH study sections, has been invited to speak at key scientific meetings, and is very well funded including having received a prestigious Burroughs Wellcome Fund [sic] grant. This is a major accomplishment given the current difficult funding environment....We would be most fortunate to recruit someone of his caliber...”

Reviewer E: “Findings from Dr. Tsai’s lab have profound implication for our understanding of ER function and the interactions in the organelle that are exploited by pathogens. Dr. Tsai’s lab is well funded and he is actively engaged in graduate training. The proposed promotion is well deserved.”

Summary of Recommendation:

Dr. Tsai has achieved a record of exceptional scholarship and funding since coming to Michigan. The importance and high quality of his research is broadly recognized by colleagues here as well as at other premier institutions. He is a stellar teacher and mentor and he has consistently assumed many administrative responsibilities within the University and the department. I am pleased to recommend Billy Tsai, Ph.D. for promotion to professor of cell and developmental biology, with tenure, Department of Cell and Developmental Biology, Medical School.



James O. Woolliscroft, M.D.
Dean
Lyle C. Roll Professor Medicine

May 2013