

PROMOTION RECOMMENDATION
UNIVERSITY OF MICHIGAN MEDICAL SCHOOL
DEPARTMENT OF MICROBIOLOGY AND IMMUNOLOGY

Michele S. Swanson, Ph.D., Associate Professor of Microbiology and Immunology, with tenure, Department of Microbiology and Immunology, Medical School, is recommended for promotion to Professor of Microbiology and Immunology, with tenure, Department of Microbiology and Immunology, Medical School.

Academic Degrees:

Ph.D.	1991	Harvard University
M.S.	1986	Columbia University
B.S.	1982	Yale University

Professional Record:

2002-present	Associate Professor of Microbiology and Immunology, University of Michigan
1996-2002	Assistant Professor of Microbiology and Immunology, University of Michigan

Summary of Evaluation:

Teaching: Dr. Swanson has held major teaching roles in her Department due to her effectiveness, versatility and talent for clear communication and ability to engage both graduate and medical students. Each year since 1999 this service has included involvement in the "M1/2 Infectious Disease Sequence" as lecturer (10-11 50-min lectures/year) and small group leader and, more recently, as a co-director. This course is highly regarded by our medical students and Dr. Swanson consistently has earned outstanding evaluations in it, with students praising the content of her materials, the class coordination, and Dr. Swanson's personal commitment. Dr. Swanson, in 2002, taught 12 hours of lectures in "Microbial Pathogenesis" (MIC609) that was well received by the approximately 20 first-year graduate students who attended. In 2005, Dr. Swanson served as Course Director for MIC812, a graduate student research seminar series highly attended by all departmental scientists. Dr. Swanson cites the most satisfying aspect of her career is, "*mentoring the talented and motivated graduate students who I have been fortunate to recruit to my laboratory.*" These have included five students who have received their Ph.D. degrees and have gone on to continue excellent careers and four graduate students currently training in her laboratory. Additionally, Dr. Swanson has provided training for five former post-doctoral fellows, including two that are now Assistant Professors, and has two current fellows with her group. Dr. Swanson has served on the thesis advisory committees of 20 University of Michigan Ph.D. students and three at other universities and the preliminary examination committee for 19 Michigan students. Further evidence of her commitment to graduate, medical student and post-doctoral training is her active membership in three graduate training programs as well as the "Student Biomedical Research" which funds summer research for medical students

and as Director of the “Advancing Diversity and Excellence in Microbial Pathogenesis Program,” whose goal is to recruit post-doctoral fellows to the Department.

Research: Dr. Swanson’s research uses the tractable bacterial pathogen *Legionella pneumophila* to understand what determines the fate of a microbe that has been ingested by a macrophage. Her work includes two major seminal discoveries. The first followed up on Marcus Horwitz’s initial observation that the macrophage vacuole in which *L. pneumophila* replicates is studded with host ribosomes. In 1995, Dr. Swanson and Dr. Ralph Isberg showed that the vacuolar membrane is derived from the host endoplasmic reticulum and that the compartment is most likely generated by autophagy. This work became a paradigm for the interaction of bacteria with the autophagic pathway and paved the way for similar studies in a broad variety of bacteria, parasites, and viruses, many of which cite Dr. Swanson’s original report. Autophagy has since become a widely appreciated contributor to the innate immune response to infection. In her second seminal discovery, Dr. Swanson noticed that the ability of *L. pneumophila* to survive within macrophages by avoiding lysosomal fusion was strictly dependant on the growth phase state of the inoculated bacteria: Log phase organisms largely perished whereas stationary phase bacterial survived. This original work (Byrne and Swanson, 1998), later led to the realization that *L. pneumophila* alternates between two distinct cell types, dedicated either to replication or to transmission in response to metabolic cues. Dr. Swanson has also published a bevy of other well-cited articles in a variety of highly respected journals including *Molecular Microbiology*, *Journal of Experimental Medicine*, and *Proceedings of the National Academy of Sciences (USA)*. Dr. Swanson has garnered considerable respect from her peers in the field is abundantly evident both by her continuous funding by the NIH since she was appointed Assistant Professor at Michigan in 1996, and by her many invitations to speak at other institutions (Dartmouth, Johns Hopkins, Yale, Harvard, Institut Pasteur) and premier international meetings such as Gordon Research Conferences, Keystone meetings, and General Meetings of the American Society for Microbiology.

Recent and Significant Publications:

Molofsky AB, Byrne BG, Whitfield NN, Madigan CA, Fuse ET, Tateda K, and Swanson MS: Cytosolic recognition of flagellin by murine macrophages restricts *Legionella pneumophila* infection. *J Exp Med* 203:1093-104, 2006.

Amer AO and Swanson MS: Autophagy is an immediate macrophage response to *Legionella pneumophila*. *Cell Microbiol* 7:765-778, 2005.

Sauer JD, Bachman MA, and Swanson MS: The phagosomal transporter A couples threonine acquisition to differentiation and replication of *Legionella pneumophila* in macrophages. *Proc Natl Acad Sci* 102: 9924-9929, 2005.

Molofsky AB, C. A. Madigan, L. M. Shetron-Rama, B. G. Byrne, and M. S. Swanson: Components of the *Legionella pneumophila* flagellar regulon contribute to multiple virulence traits, including lysosome avoidance and macrophage death. *Infect Immun* 73: 5720-5734, 2005.

Molofsky, A. B. and M. S. Swanson: *Legionella pneumophila* CsrA is a pivotal repressor of transmission traits and activator of replication. *Mol Microbiol*, 50: 445-461, 2003.

Service: Dr. Swanson's dedication to service is outstanding at all levels. She has served on all of the major departmental committees including the Appointments, Promotions, and Awards Committee and the Graduate Studies Committee. She chaired the Microbiology Concentration Task Force. Dr. Swanson has been deeply involved in promoting gender equality and diversity through her service on the advisory board for the President's Commission on Women's Issues and the Junior Women Faculty Network, as a reviewer for ADVANCE Elizabeth Crosby Award proposals, and as the director of the Advancing Diversity and Excellence in Microbial Pathogenesis Program. Dr. Swanson has also acted as a reviewer for several local grant competitions including for the Biomedical Research Council, Office of the Vice President for Research, and the Endowment for the Biological Sciences Biodefense and Vaccinology Pilot Grants. Nationally, Dr. Swanson has served as an *ad hoc* member of four NIH study sections and several other granting agencies including the National Science Foundation and The Wellcome Trust. She has also generously offered her time as a reviewer for 23 different journals including *PNAS*, *Cell*, *Science*, and *Nature*, served on the editorial boards for *Infection and Immunity*, *Autophagy*, and *Molecular Microbiology*, and is currently an editor for *Microbiology and Molecular Biology Reviews*. Finally, Dr. Swanson has been actively involved in organizing several important scientific meetings including serving on the organizing committee for, to name a few, the 6th International Conference on *Legionella*, the General Meeting Program Committee for the American Society for Microbiology, and 2007 Vice-Chair of the FASEB Summer Research Conference on Microbial Pathogenesis, which she will Chair in 2009.

External Review:

Reviewer A: "Since becoming a faculty member, Dr. Swanson has unquestionably emerged as a leading investigator in the field of *L. pneumophila*, the agent of Legionnaires' disease. Her work is of the very highest quality and is represented by stellar, primary publications in our leading journals..."

Reviewer B: "She has received numerous invitations to speak at national and international meetings, to present seminars at major universities and to serve on grant review panels and editorial boards. By any measure, she has been recognized as a researcher and scholar of very high merit."

Reviewer C: "As indicated by her successful grants record, her contribution to the field of pathogenic microbes is exceptional, and her studies have always been intensive, comprehensive and unique."

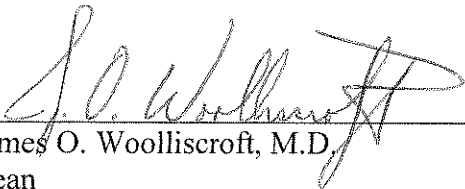
Reviewer D: "She probably leads the world in combining metabolism and *Legionella* pathogenesis and is one of the top handful of labs in the world working on *Legionella* intracellular parasitism."

Reviewer E: “Clearly, this is someone looking to play an active role in the academic and professional spheres beyond their own laboratory—in other words a leader.”

Reviewer F: “I have been in the *Legionella* field for over 25 years and I can honestly say that Michele has been a refreshing new face in this field and her seminal work has in many ways contributed to rejuvenating the field.”

Summary of Recommendation:

Dr. Swanson is a very productive and highly respected investigator who is recognized internationally as a leader in the field of bacterial pathogenesis. She has demonstrated herself to be an effective and appreciated teacher and mentor. Dr. Swanson is a valued colleague in and outside the Department and University. I enthusiastically support Dr. Michele Swanson for promotion to Professor of Microbiology and Immunology.



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

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