UNIVERSITY OF WISCONSIN-LA CROSSE

Distinguished Speaker in the *Life Sciences*

Thursday, April 25, 2019

Daniel Klionsky, Ph.D.

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Department of Molecular, Cell & Developmental Biology
University of Michigan College of Literature, Science, and the Arts

A cell biologist, Klionsky is renowned for his pioneering contributions to the understanding of autophagy, the process by which cells break down to survive stress conditions such as starvation, and the role autophagy plays in cancer, neurodegenerative diseases and other areas of human health.

Working with baker's yeast cells, Klionsky characterized the protein pathways and signaling mechanisms by which a cell senses and responds to its environment. He also identified the cytoplasm-to-vacuole targeting pathway, a type of selective autophagy. His lab was the first to demonstrate endoplasmic reticulum stress-induced autophagy and autophagy in zebrafish.

Sponsored by UWL College of Science and Health

For disability accommodations:
Susan Hall, 3002 Cowley Hall, 608.785.6960, shall@uwlax.edu

Thursday, April 25 - 5:30 p.m.

RESEARCH TALK

The Bluffs Room, The Union

If you only have time to attend one talk on autophagy today, this is the one

Macroautophagy/autophagy is a process of cellular self-digestion that plays a critical role in cytoprotective responses to stress. Defects in autophagy in humans are associated with a wide range of pathologies including cancer, neurodegeneration, diabetes, and heart disease. Designing effective therapies for these pathophysiologies will require a greater understanding of the mechanism and regulation of autophagy. The overall pathway and the protein components of autophagy are highly conserved from yeast to human; over 40 autophagy-related (*ATG*) genes have been identified in yeast, and homologs exist for many of them in more complex eukaryotes. Many questions concerning the molecular basis of the autophagy pathway remain unanswered. For example, how is the initial sequestering compartment, the phagophore, nucleated? What is the origin of the membrane used for expansion of the phagophore to form the autophagosome? What are the roles of the various Atg proteins in the process of autophagosome biogenesis?

We have been analyzing the regulation of autophagy in *Saccharomyces cerevisiae*. Two of the central autophagy-related proteins are Atg8 and Atg9: The amount of Atg8 determines the size of autophagosomes, whereas the Atg9 level controls the rate of autophagosome formation; therefore, we are interested in the transcriptional and post-transcriptional processes that regulate their function. The *ATG8*gene in particular is controlled through a complex network that involves negative regulation through several distinct mechanisms; this ensures an appropriate level of homeostatic autophagy, while preparing cells to rapidly induce autophagy when they encounter stress.