

Dissertation: Degeneration in Miniature: History of Cell Death and Aging Research in the Twentieth Century

Editor's note:

Lijing Jiang defended her dissertation titled “Degeneration in Miniature: History of Cell Death and Aging Research in the Twentieth Century” in August 2013 in front of committee members Jane Maienschein, Manfred Laubichler, James Hurlbut, Richard Creath, and Michael White, earning her a Doctor of Philosophy degree in Biology. <https://repository.asu.edu/items/18823>

Abstract:

Once perceived as an unimportant occurrence in living organisms, cell degeneration was reconfigured as an important biological phenomenon in development, aging, health, and diseases in the twentieth century. This dissertation tells a twentieth-century history of scientific investigations on cell degeneration, including cell death and aging. By describing four central developments in cell degeneration research with the four major chapters, I trace the emergence of the degenerating cell as a scientific object, describe the generations of a variety of concepts, interpretations and usages associated with cell death and aging, and analyze the transforming influences of the rising cell degeneration research.

Particularly, the four chapters show how the changing scientific practices about cellular life in embryology, cell culture, aging research, and molecular biology of *Caenorhabditis elegans* shaped the interpretations about cell degeneration in the twentieth-century as life-shaping, limit-setting, complex, yet regulated. These events created and consolidated important concepts in life sciences such as programmed cell death, the Hayflick limit, apoptosis, and death genes. These cases also transformed the material and epistemic practices about the end of cellular life subsequently and led to the formations of new research communities. The four cases together show the ways cell degeneration became a shared subject between molecular cell biology, developmental biology, gerontology, oncology, and pathology of degenerative diseases. These practices and perspectives created a special kind of interconnectivity between different fields and led to a level of interdisciplinarity within cell degeneration research by the early 1990s.