Biology of aging 1985 to 2015: Are we ready for clinical interventions?

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The quality of research by our recent generation of geroscientists has been validated by a remarkable increase in the rates at which their publications have appeared in what most scientists would consider to be among the most prestigious journals – including Cell, Science, Nature and PNAS (GM Martin, FASEB J. 25: 3756-62, 2011). Validation has also come from the award of the 2009 Nobel Prize for the discovery of telomerase (http://www.nobelprize.org/nobel_prizes/medicine/laureates/2009/press.html) and from a 2014 David Dan award for the elucidation of the role of the IGF1 signaling pathway in the modulation of the lifespan of *C. elegans* (http://www.dandavidprize.org/media-events/laureates-announcements/284-laureates-announced-2011). But are we ready for translations of what we have learned towards clinical interventions? Google's Calico and Craig Ventnor's Human Longevity, Inc. are lines of evidence in the affirmative. More substantial evidence comes from the remarkable success of the Mouse Intervention Testing program of the US National Institute on Aging (https://www.nia.nih.gov/research/dab/interventions-testing-program-itp), particularly the discovery of the effects of rapamycin.

There are some cautionary notes, however. For the case of the four-way cross mice used for the rapamycin experiments, for example, side effects included testicular degeneration and accelerated rates of ocular cataracts. Genetic background effects have also been underestimated by our community, as exemplified by the striking variations of the impact of dietary restriction among recombinant inbred mice (CY Liao et al., Aging Cell 9:92-5, 2010). Let us hope, however, that the development of canine models (http://www.uwaging.org/CLC) and precision medicine, particularly pharmacogenetics, will begin to address individual variations, including dosimetry.