Science & Technology for Healthy Longevity: A Workshop for the Global Roadmap for Healthy Aging

Eric Verdin, MD
Buck Institute for Research on Aging
June 14, 2021

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Live better longer

-Populations in the developed world are rapidly aging

-Aging is the biggest risk factor for the chronic diseases of aging

-The science of aging has made remarkable progress:

Aging is malleable and controlled by specific pathways

-Interventions that target aging will be critical for true preventative medicine

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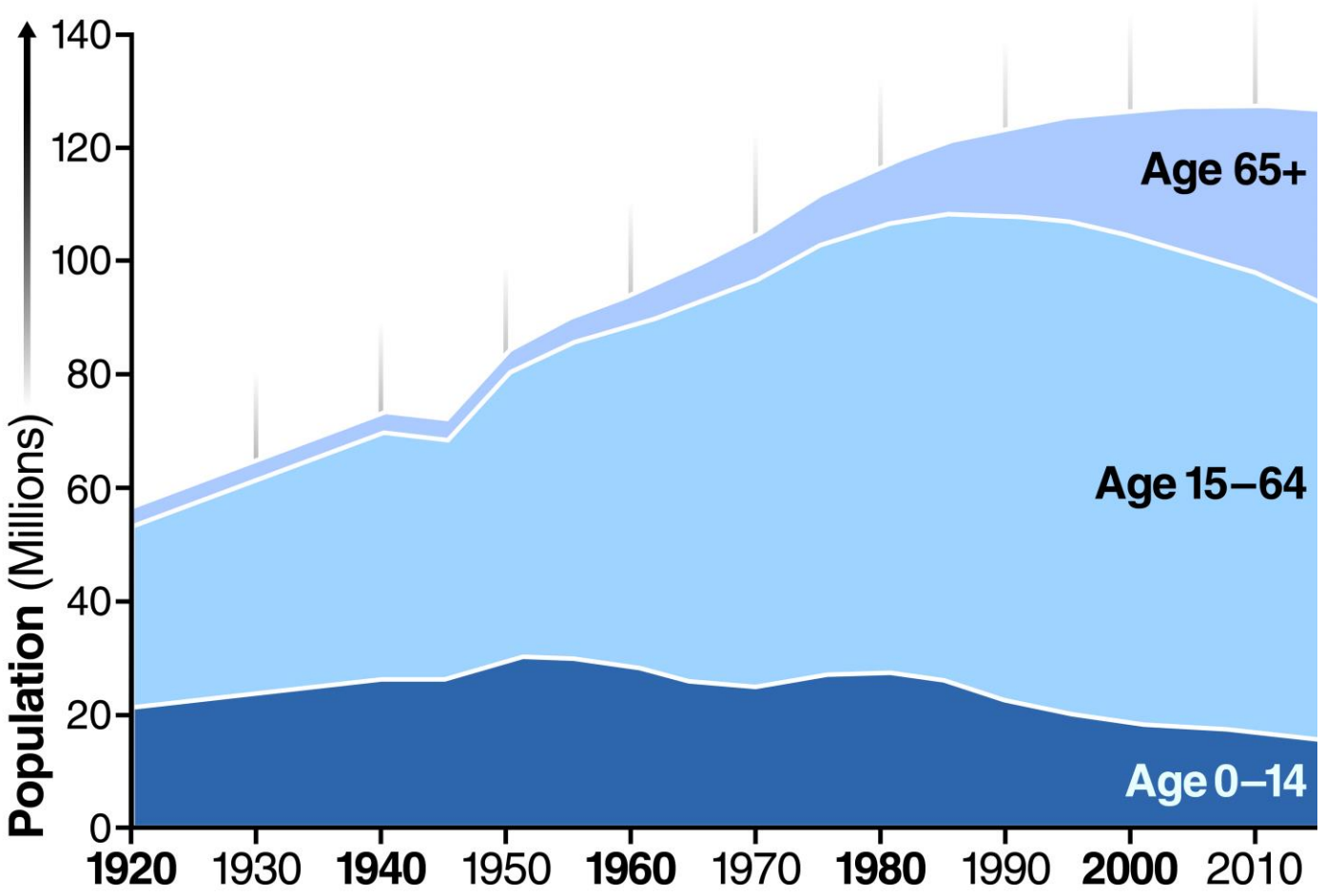
Population of Japan from 1920 to 2010



Source: Wikipedia: Jon McDonald, based on Japan Statistical Yearbook, Chapter 2: Population and Households

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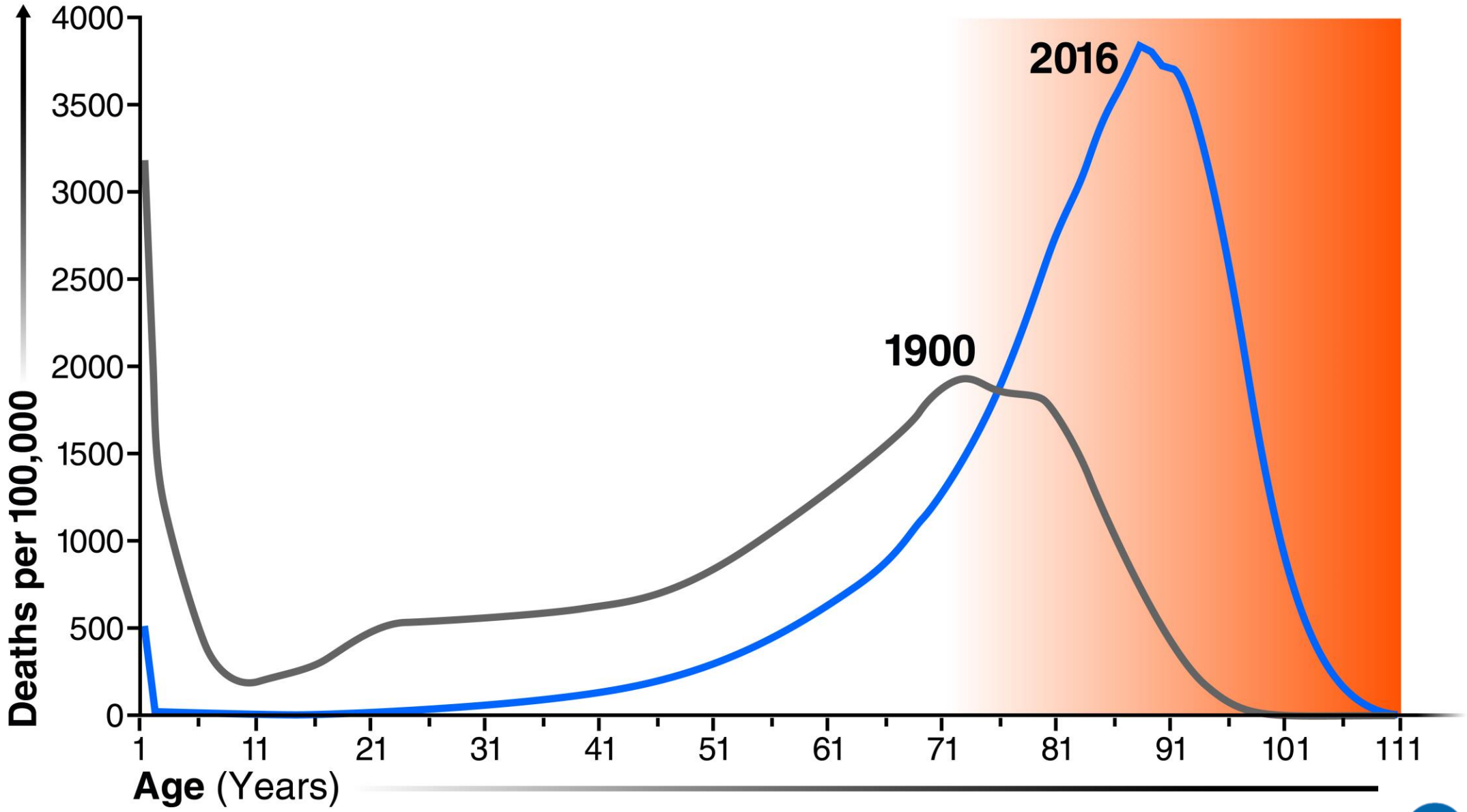
History of Life Expectancy: Age at Death



Olshansky, *JAMA* 2018; **320**:1323

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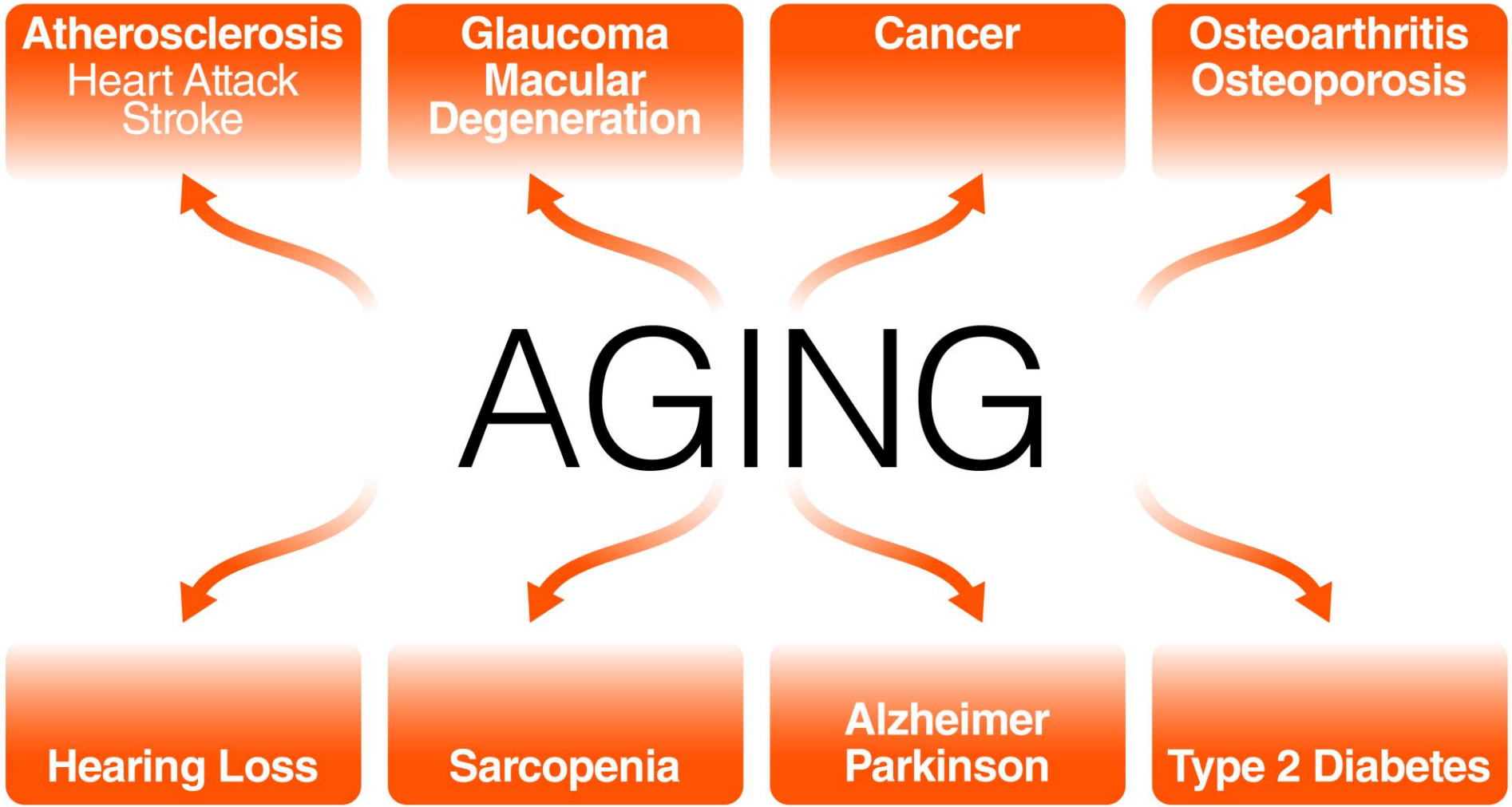
Atherosclerosis
Heart Attack
Stroke
Glaucoma
Macular
Degeneration
Cancer
Osteoarthritis
Osteoporosis
AGING
Hearing Loss
Sarcopenia
Alzheimer
Parkinson
Type 2 Diabetes

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The Geroscience Hypothesis: Aging is the Strongest Risk Factor for Age-Related Diseases

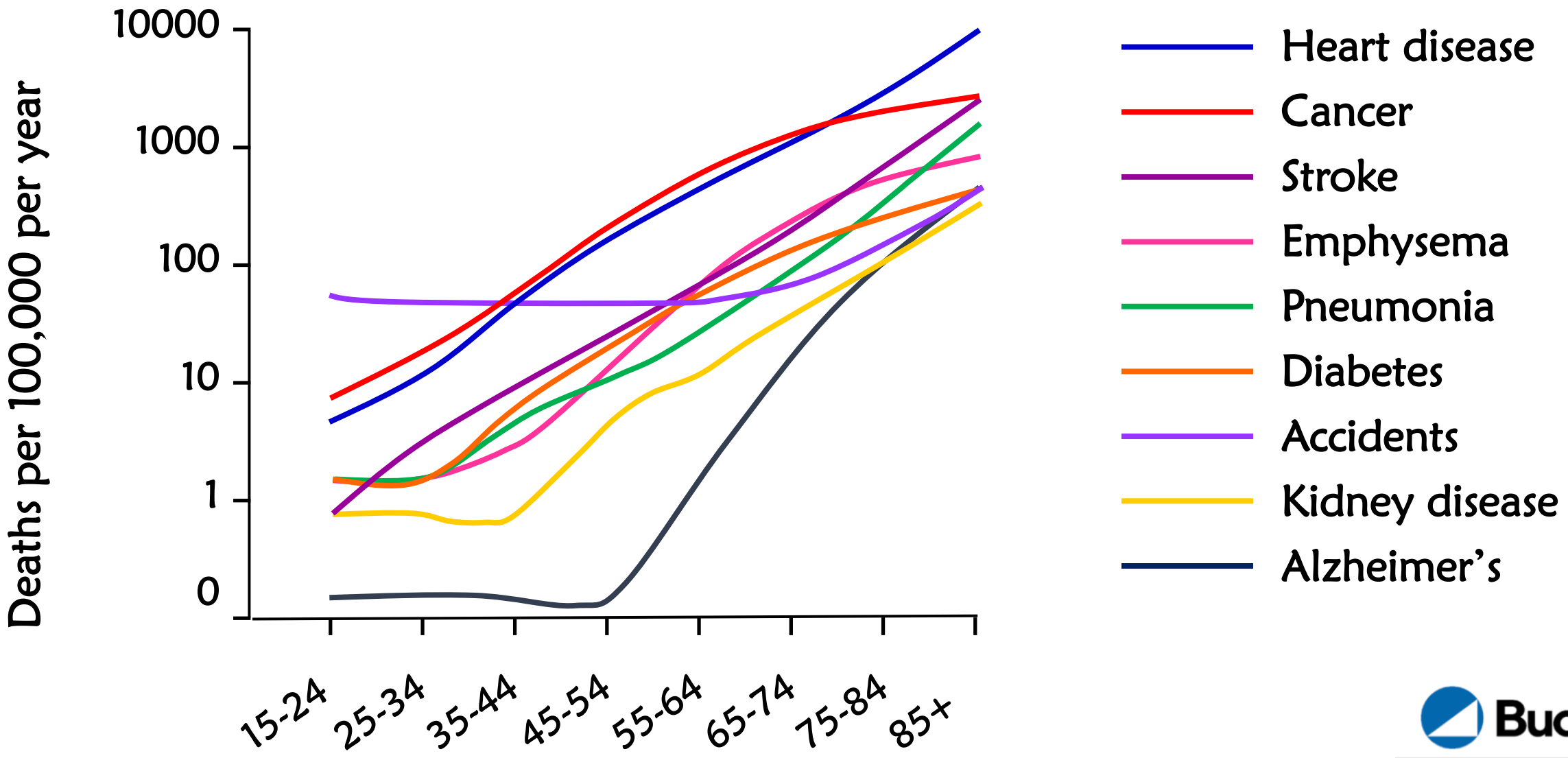

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Image: Lia Koltyrina/Shutterstock

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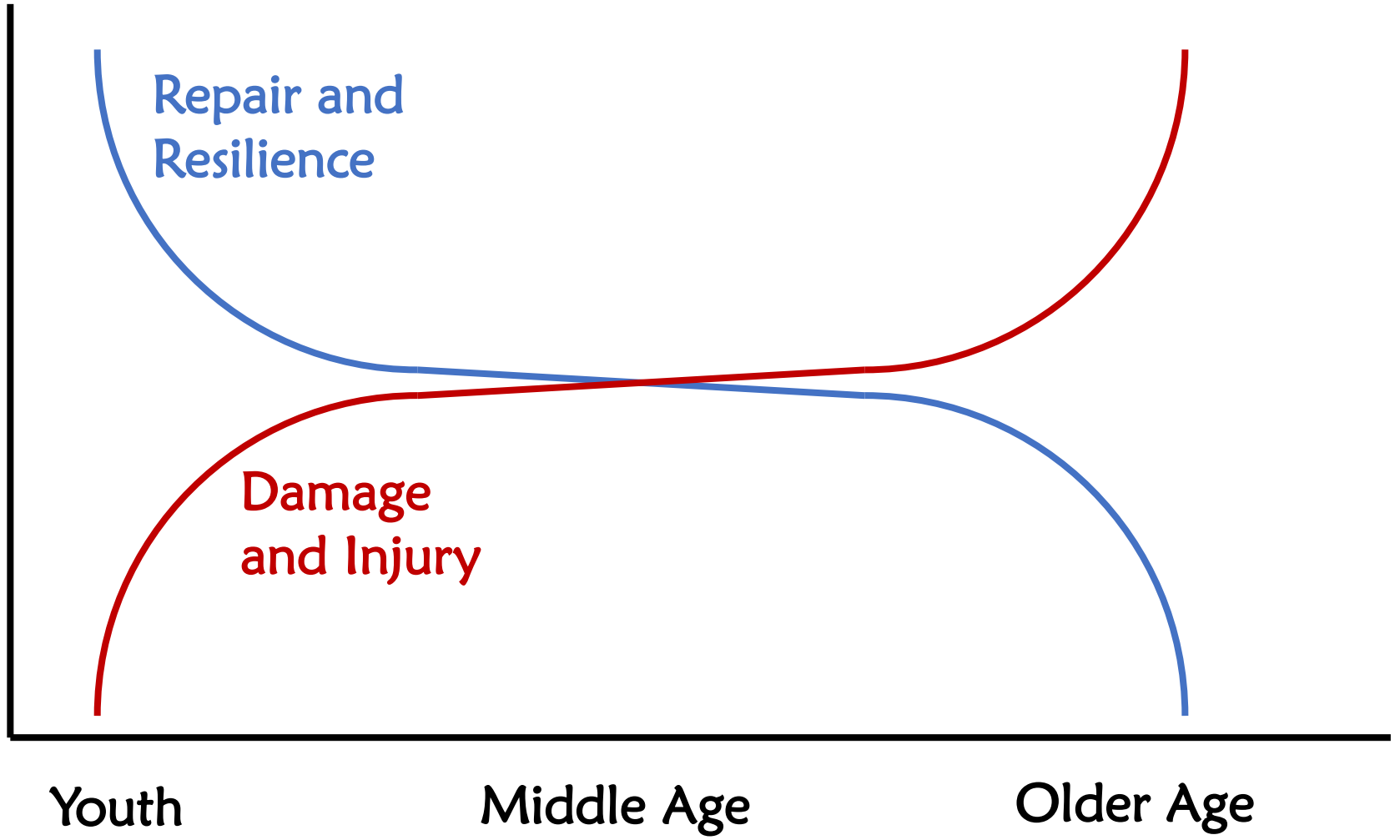
What is Aging?



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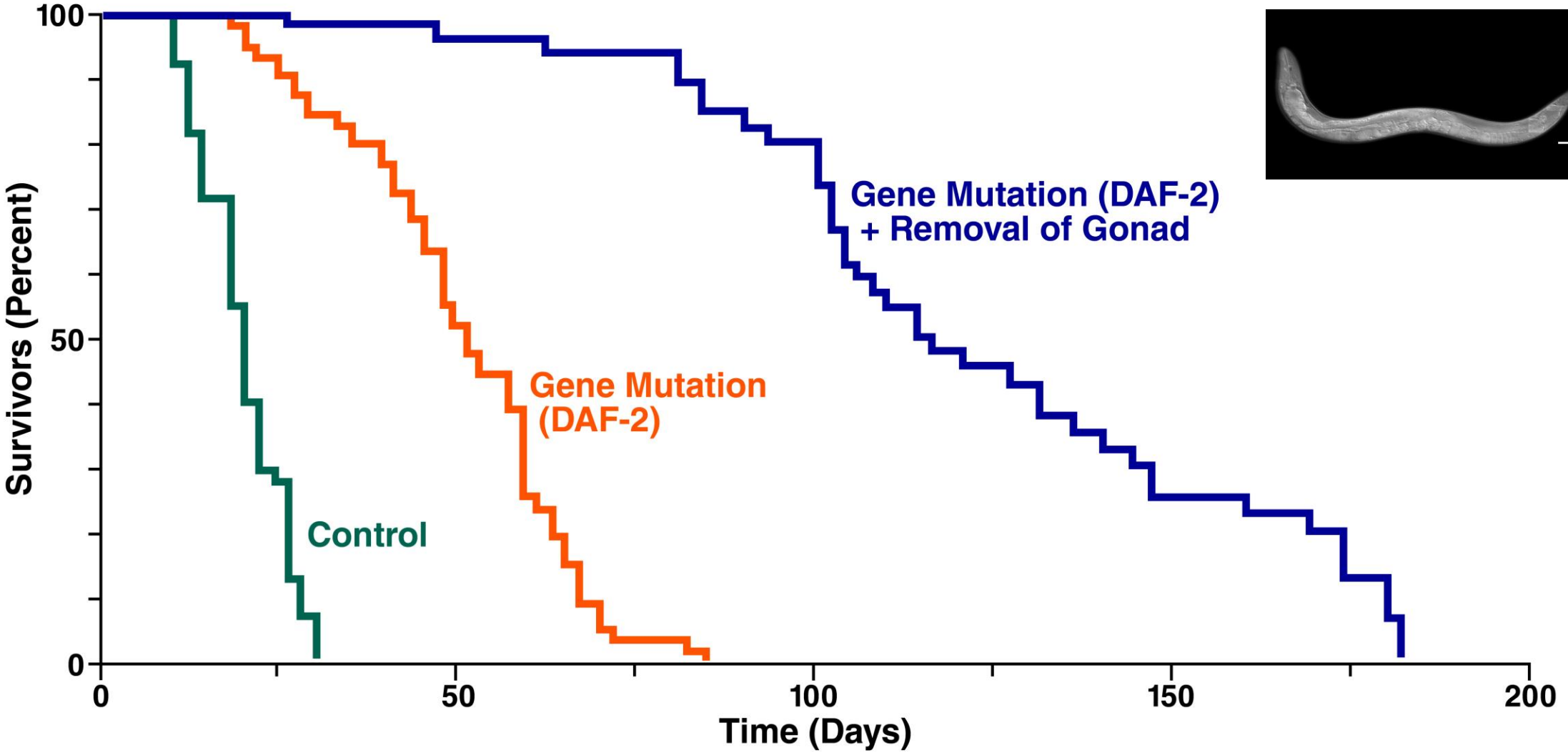
Genes Control Lifespan



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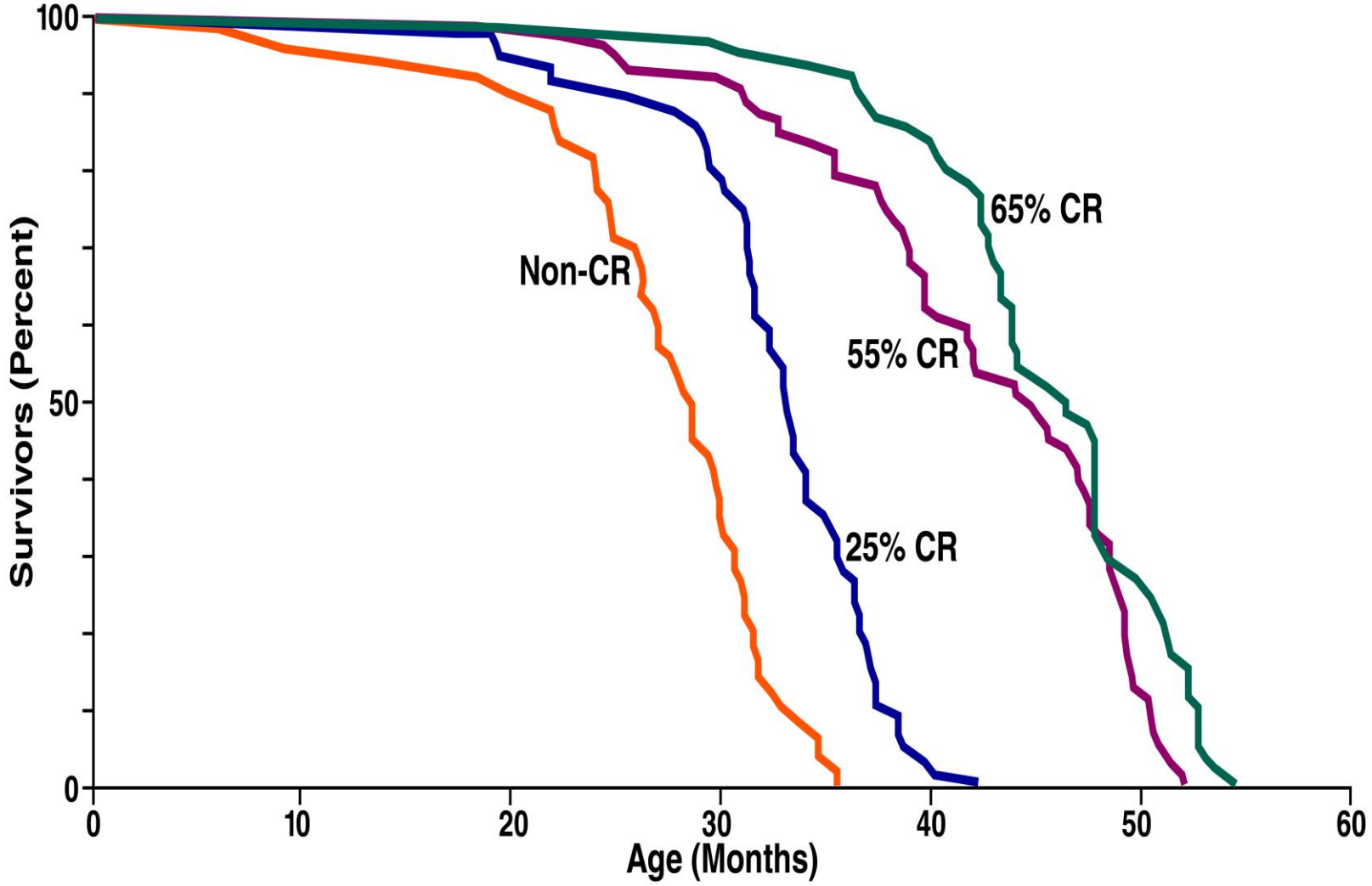
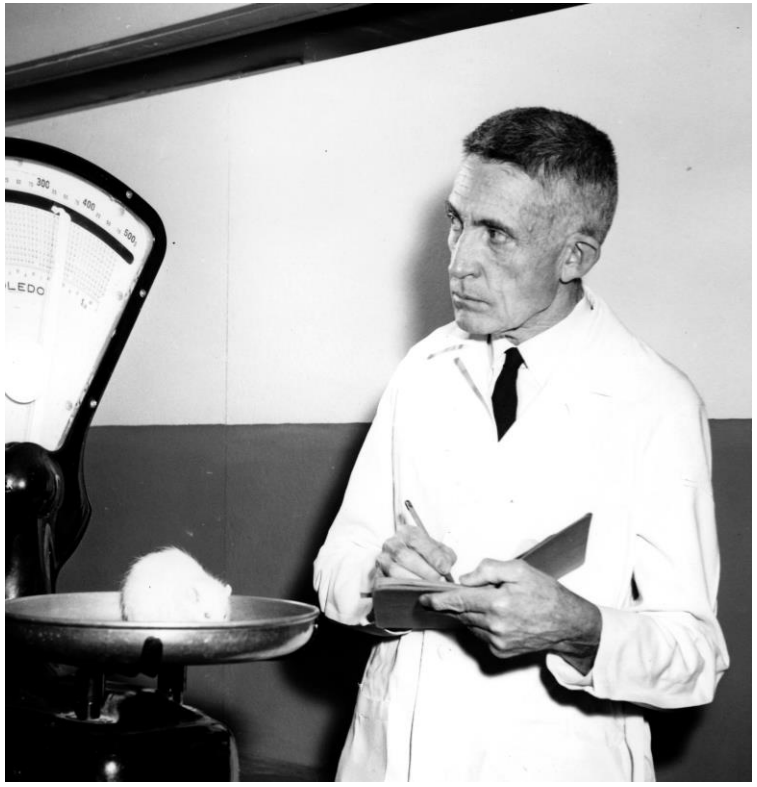
Modulation of Lifespan/Healthspan by Calorie Restriction



Clive McCay (1898-1968)



Weindruch et al, J Nutr 1986; 116:641-654

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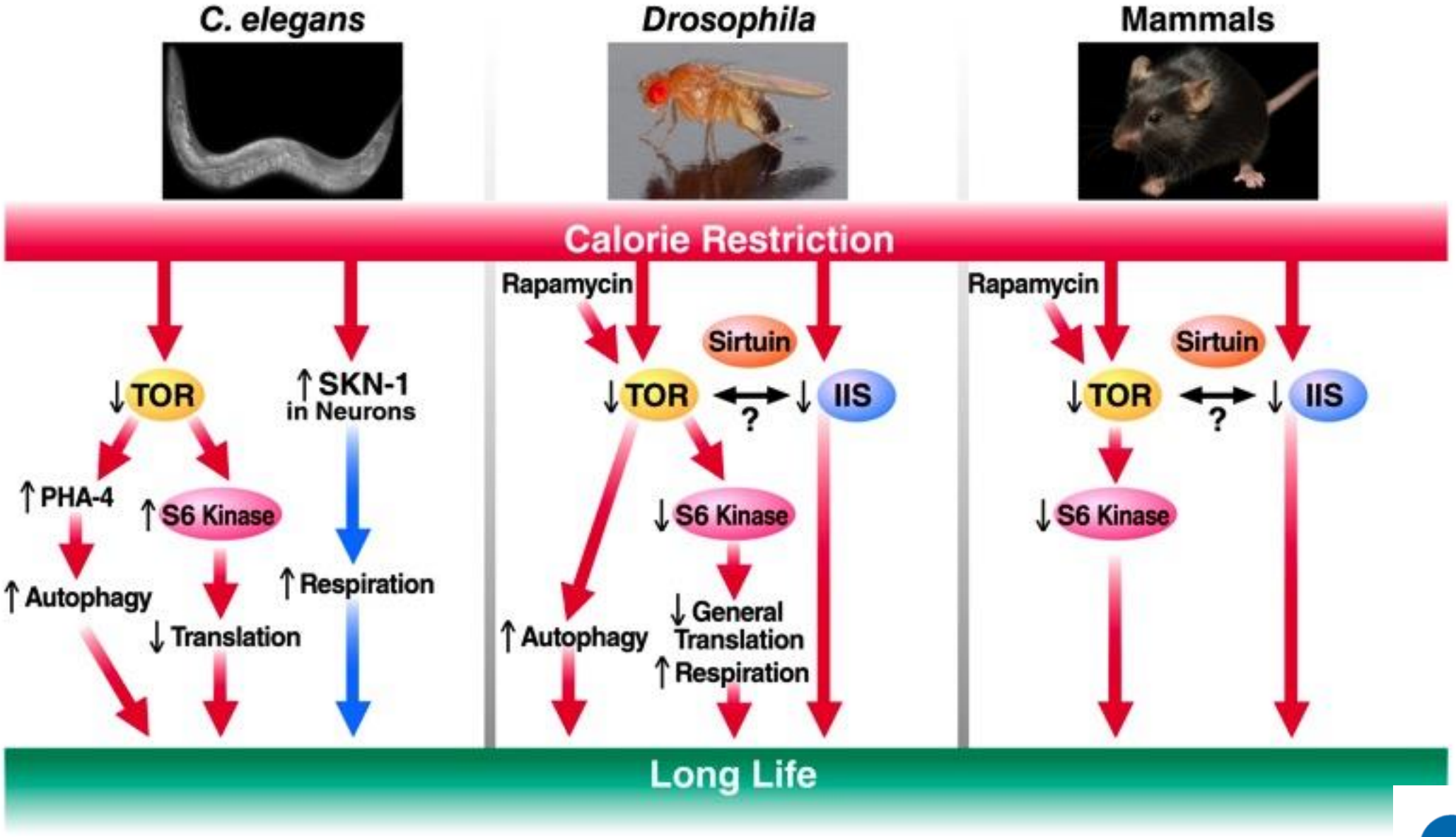
Conserved Pathways Mediate Calorie Restriction



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Medicine in the 20th Century

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Focusing on Aging to Change Medicine

Sick Care

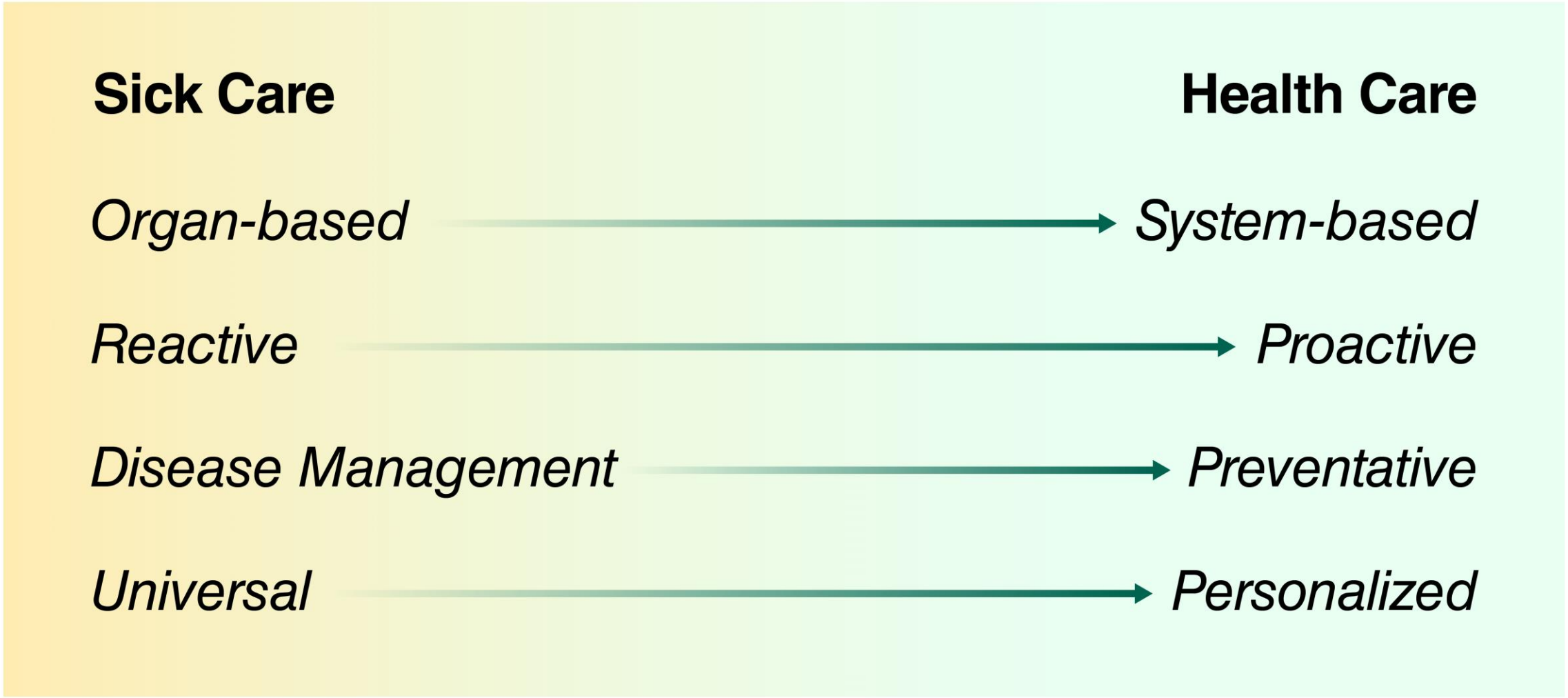
Organ-based

Reactive

Disease Management

Universal

Focusing on Aging to Change Medicine



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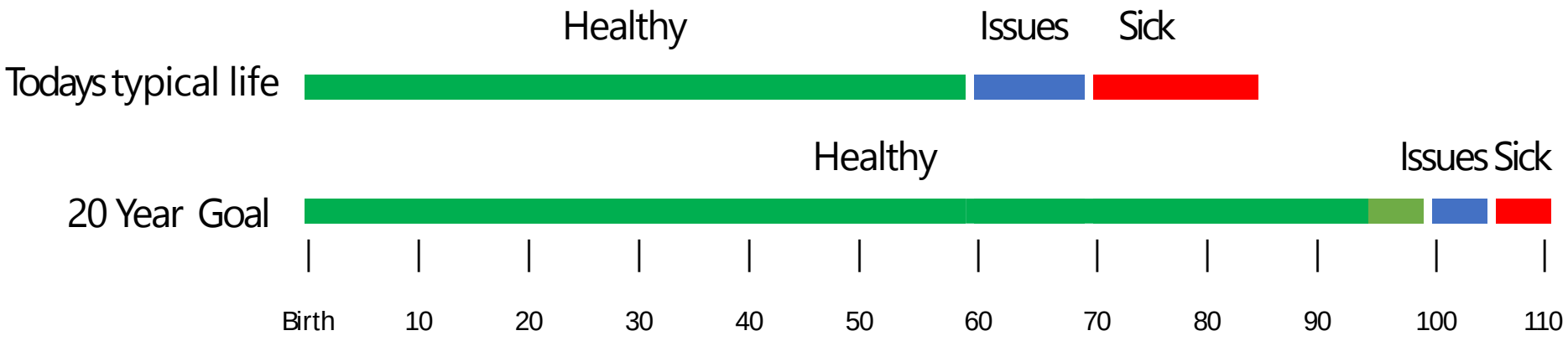
Our goal: Extending healthspan and lifespan



Sources: Axon Capital Partners Research

What would you do with an extra 20 years of healthy life?

Thank You!

everdin@buckinstitute.org

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Live better longer

Health Monitoring: Yesterday, Today and Tomorrow

Vital Signs: heart rate (Afib), heart rate variation (HRV), blood pressure, temperature, respiratory rate, weight, body composition…

Novel Functional Tools: steps/day, movement, gait speed, grip strength, VO_2max, “living space”, fall/balance monitoring, voice recognition, complex gait analysis. Sleep analysis **(**REM vs. deep vs awake)

New Biomarkers of Aging: Horvath clocks, Proteomics clocks, Transcriptomics Clocks, iAge, Glycan Age, SASPome, facial recognition..

Buck Institute for Research on Aging

First free-standing research institute in the world focused solely on the biology of aging

24 research groups
230 employees from over 30 countries

Nonprofit, opened in 1999

IM Pei-designed 250K square-foot campus North of San Francisco

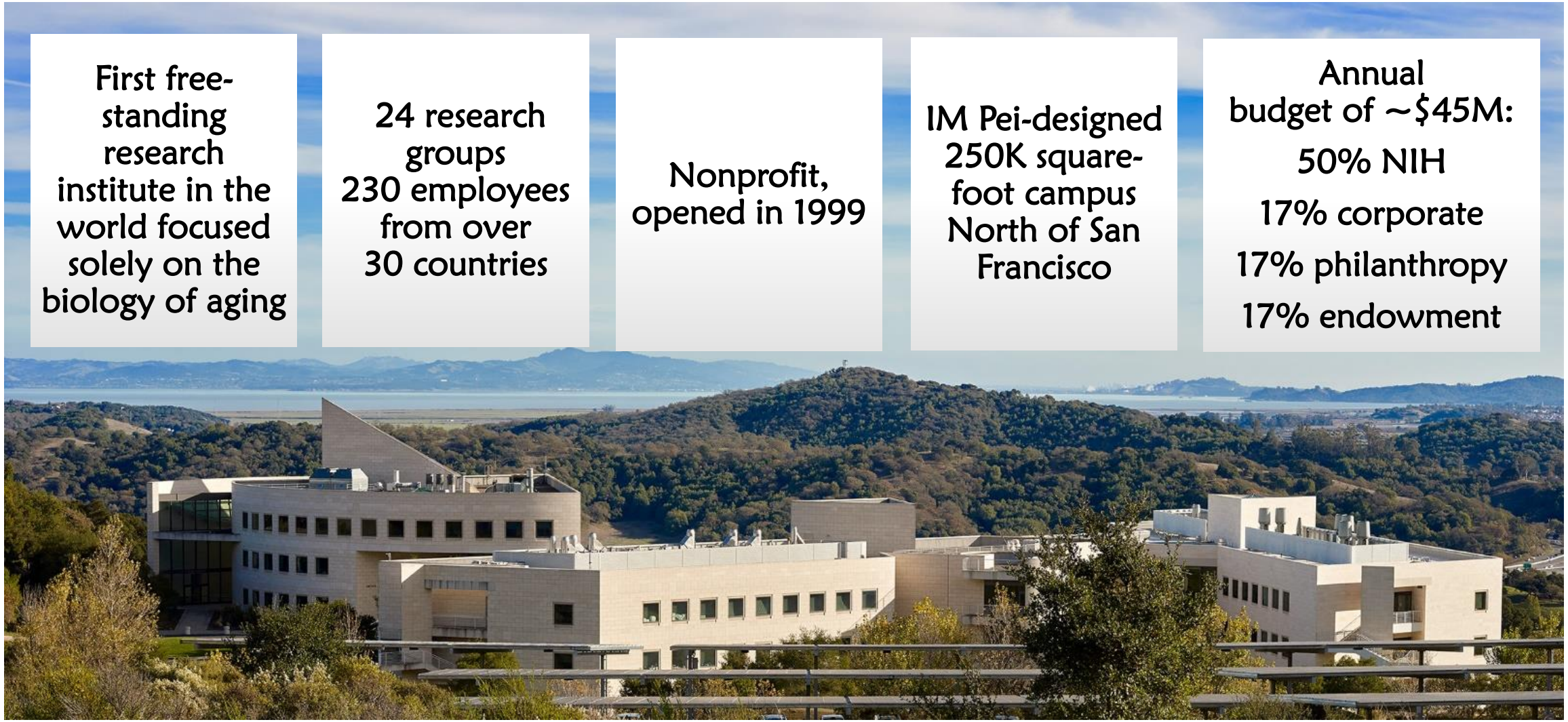
Annual budget of ~$45M:

50% NIH

17% corporate

17% philanthropy

17% endowment



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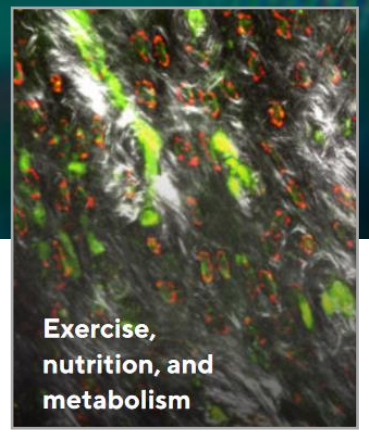
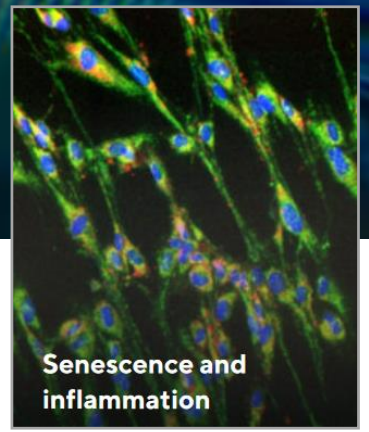
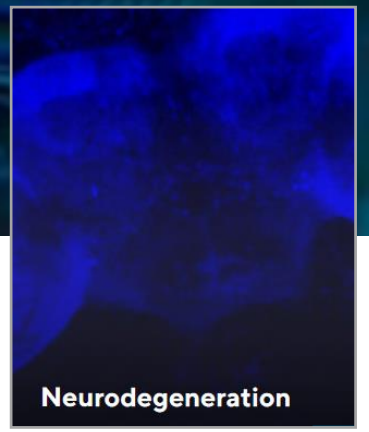
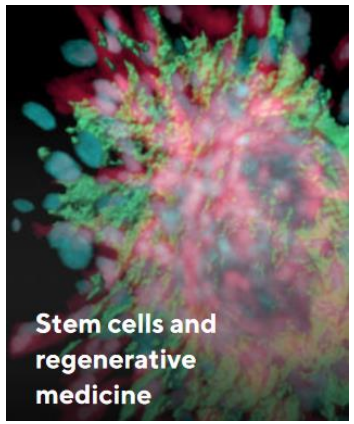
Buck's Focus Areas

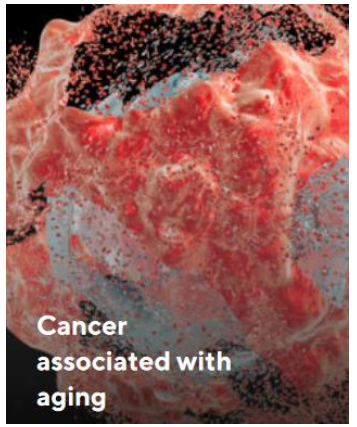
buckinstitute.org

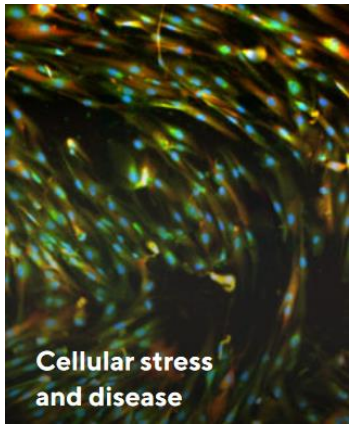












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