

Biological Theories of Aging

I CELLULAR THEORIES

(A) GENETIC THEORIES

Mutation Accumulation:

Somatic Mutation Theory (Curtis)

“Hit Theory” (Szilard)

Genetic “Clock Theory” (Hayflick)

(B) NON-GENETIC THEORIES

Rate-of-Living/Thermodynamic Theory (Pearl; Sacher)

Free Radical Theory/Oxidative Stress (Harmon)

II PHYSIOLOGICAL/SYSTEM-LEVEL THEORIES

Cardiovascular Theory

Cross-Link (Collagen) Theory

Hormone Insufficiency

Thyroid hormone; Testosterone; etc.

Stress Theory (Selye)

Auto-Immunity Theory (Walford)

III MICROBIOLOGICAL MULTIPLEX

Multiple genetically-controlled mechanisms; no grand theory, *per se*

e.g.,

Telomeres/Telomerase (Blackburn/Greider/Szostak)

Genetic effects of caloric restriction (gene up/down regulation)

IV EVOLUTIONARY THEORIES

Programmed Senescence

Active destruction: e.g., apoptosis in worm models

Passive entropy: DNA developmental script ends circa puberty