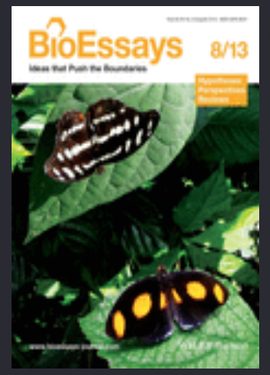

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ARTICLE

Evolution of sex differences in lifespan and aging: Causes and constraints

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Evolution of sex differences in lifespan and aging: Causes and constraints

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Why do the two sexes have different lifespans and rates of aging? Two hypotheses based on asymmetric inheritance of sex chromosomes ("unguarded X") or mitochondrial genomes ("mother's curse") explain sex differences in lifespan as sex-specific maladaptation leading to increased mortality in the shorter-lived sex. While asymmetric inheritance hypotheses equate long life with high fitness, considerable empirical evidence suggests that sexes resolve the fundamental tradeoff between reproduction and survival differently resulting in sex-specific optima for lifespan. However, selection for sex-specific values in life history traits is constrained by intersexual

Introduction

Women live longer than men in most countries [1–4] and this phenomenon has attracted considerable cross-disciplinary attention [5–10]. Yet this pattern is a commonplace among mammals and, in general, sexual dimorphism in lifespan is widespread across the tree of life [1, 11–13]. Early biological hypotheses that aimed to explain the sex differences in lifespan centered on the role of sex chromosomes and relied heavily on the fact that recessive deleterious mutations occurring on X (or Z) chromosome are not "guarded" by alleles on the second chromosome in the heterogametic sex resulting in increased mortality [6, 14]. Another commonly