



Recent advances in calorie restriction research on aging.

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Abstract

The extension of both median and maximum lifespan and the suppression of age-related diseases in laboratory animals by reduced food intake, i.e., calorie restriction (CR) are regarded as hallmarks of CR's anti-aging action. The diverse efficacy of CR to counteract aging effects and its experimental reproducibility has made it the gold standard of many aging intervention studies of recent years. Although CR originally was used as a tool to perturb the aging process of laboratory animals as to uncover clues of underlying mechanisms of aging processes, current CR research interests have shifted to the retardation of aging-related functional decline and the prevention of age-related diseases. Advances in CR research on non-human primates and recent endeavors using human subjects offer a promising outlook for CR's beneficial effects in healthy human aging. In this review, several major issues related to CR's anti-aging mechanisms are discussed by highlighting the importance of modulating deleterious chronic inflammation at molecular levels and the impact of epigenetic chromatin and histone modifications by CR at the ultimate control sites of gene expression. The recent research on rapamycin as a CR mimetic is summarized and a brief description of intermittent feeding patterns is reviewed in comparison to the CR effect.

KEYWORDS: Aging interventions; CR mimetics; Calorie restriction; Epigenetics; Inflammation; Intermittent feeding; mTOR

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