

## **Calorie restriction, aging, and cancer prevention: mechanisms of action and applicability to humans.**

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*Annual Review of Medicine.* 2003; 54:131-52 PMID: 12525670

Calorie restriction (CR) is the most effective and reproducible intervention for increasing lifespan in a variety of animal species, including mammals. CR is also the most potent, broadly acting cancer-prevention regimen in experimental carcinogenesis models. Translation of the knowledge gained from CR research to human chronic disease prevention and the promotion of healthy aging is critical, especially because obesity, which is an important risk factor for several chronic diseases, including many cancers, is alarmingly increasing in the Western world. This review synthesizes the key biological mechanisms underlying many of the beneficial effects of CR, with a particular focus on the insulin-like growth factor-1 pathway. We also describe some of the opportunities now available for investigations, including gene expression profiling studies, the development of pharmacological mimetics of CR, and the integration of CR regimens with targeted, mechanism-based interventions. These approaches will facilitate the translation of CR research into strategies for effective human chronic disease prevention.

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