A novel anti-aging animal model using SIRT1 transgenic mice

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Technology description

Summary

Aging and aging-related diseases are fast becoming a widespread concern in most developed countries, contributing to increased pressure on healthcare providers and other social services. Currently, no drugs specifically aimed at extending the human lifespan are available. This technology is an anti-aging animal model that can be implemented in the discovery of new anti-aging drugs. This gain-of-function animal model provides researchers with an effective means of studying age-related disorders and evaluating therapeutic efficacy of novel anti-aging compounds.

Activation of SIRT1 extends lifespan by mimicking effects of caloric restriction

This technology extends the lifespan of the animals by mimicking the effects of caloric restriction. Caloric restriction has been shown to extend lifespans in many animal models by modulating sirtuins and improving energy efficiency. In this technology, the transgenic mice feature constituently-activated sirtuin 1 (SIRT1). Activation of this pathway leads to downstream enhancement of multiple proteins within the caloric restriction pathway. This modulation produces beneficial effects on glucose homeostasis and insulin sensitivity, delaying the onset of conditions like diabetes, and indicates an anti-aging effect.

This gain-of-function mouse line has been developed, and its ability to reproduce effects of caloric restriction has been experimentally confirmed.

Publications

Banks AS, Kon N, Knight C, Matsumoto M, Gutierrez-Juarez R, Rossetti L, Gu W, Accili D. "SirT1 gain of function increases energy efficiency and prevents diabetes in mice." Cell Metab. 2008 Oct. 8(4):333-41.

Application area

Tool to study metabolic disease (i.e. diabetes)

Tool to screen for new anti-aging compounds

Tool to investigate the onset and pathobiology of age-related diseases (e.g. Alzheimer's, heart disease, stroke, cancer, etc.)

Advantages

Realistic replication and expression pattern of gene of interest

Effectively evaluates active molecules in aging-related phenotype screens

Mimics effects of caloric restriction through SIRT1 activation

Useful in vivo model for analyzing potential of small-molecule compounds for anti-aging

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