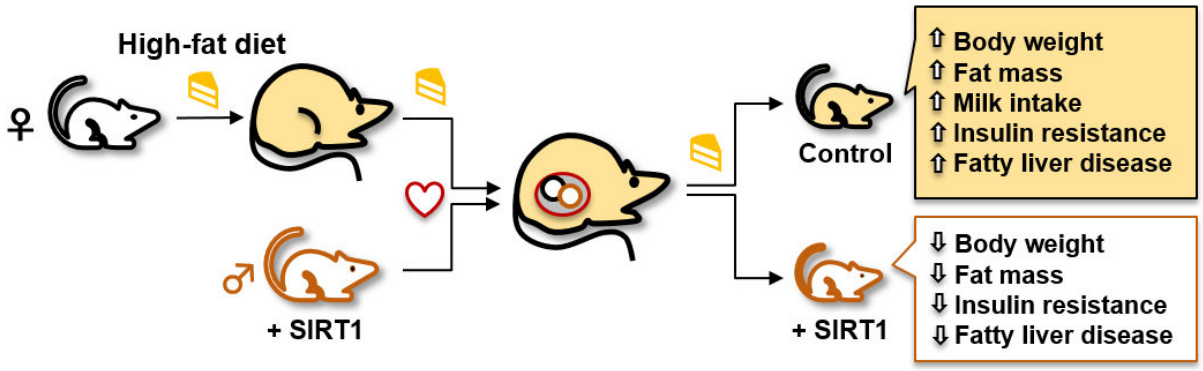
Medical Xpress

Stress protein could be used to prevent childhood obesity in males

October 31 2018



Male offspring with the additional SIRT1 gene show lower body weight and attenuation of metabolic disorders due to obesity in mothers. Credit: Long Nguyen

New research published in *The Journal of Physiology* identifies a novel protein that reduces the likelihood of obesity and related metabolic disorders in boys.

It is well-known that unhealthy parental lifestyles and health conditions including obesity (particularly from the mothers) are linked to an increased risk of obesity, diabetes and other metabolic disorders in children. However, the underlying mechanism has not been clearly understood.

This new research focuses on the protein SIRT1, which is an important regulator of metabolism and stress responses. The bulk of previous studies suggest that SIRT1 plays important roles in age-related diseases. This new finding links the development of childhood metabolic disorders in males due to obesity in mothers to reduced SIRT1 levels in these offspring. In other words, when the level of SIRT1 is increased in the male offspring, excessive weight gain is halted, blood sugar regulation is improved, and the levels of fat in the blood and liver of these offspring are reduced.

The research conducted by University of Sydney and University of Technology Sydney involved breeding females on a high fat diet with male mice genetically-modified to have an additional SIRT1 gene. Male offspring were either normal or had increased levels of SIRT1. These pups were then examined for signs of developing metabolic diseases.

Dr. Long The Nguyen, first author on the study, commented on the findings:

"Gestational weight control and current therapeutic practices are ineffective in preventing the effects of maternal obesity on the next generation. Our study provides evidence of SIRT1 countering metabolic disorders in offspring of mothers on high fat diets, making it a promising therapeutic target in humans."

Further studies involving an investigation of the offspring in adulthood, and also their children, are being conducted to understand the prolonged and intergenerational effects of SIRT1 therapy.

More information: SIRT1 overexpression reprograms offspring metabolic and liver disorders due to maternal high-fat feeding, *Journal of Physiology* (2018). DOI: 10.1113/JP276957