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Mice Deficient in SFRP1 Exhibit Increased Adiposity, Dysregulated Glucose Metabolism

Lotfi M. Bassa
University of Massachusetts Amherst

Et al.

MICE DEFICIENT IN SFRP1 EXHIBIT INCREASED ADIPOSITY, DYSREGULATED GLUCOSE METABOLISM.

Lotfi M. Bassa, Kelly J. Gauger, Elizabeth M. Henchey, Melissa Brown, , and Sallie S. Schneider

Department of Veterinary and Animal Science, University of Massachusetts Amherst. Pioneer Valley Life Science Institute, Springfield, MA

Contact Info: lbassa@cns.umass.edu, Sallie.Schneider@bhs.org

The molecular mechanisms involved in the development of obesity and related complications remain unclear. Wnt signaling plays an important role in preadipocyte differentiation and adipogenesis. The expression of a Wnt antagonist, secreted frizzled related protein 1 (SFRP1), is increased in response to initial weight gain, then levels are reduced under conditions of extreme obesity in both humans and animals. Here we report that loss of *Sfrp1* exacerbates weight gain and glucose homeostasis in mice in response to diet induced obesity (DIO). *Sfrp1*$^{-/-}$ mice fed a high fat diet (HFD) exhibited an increase in body mass accompanied by increases in body fat percentage, visceral WAT mass, and adipocyte size. Fasting glucose levels are elevated, glucose clearance is impaired, hepatic gluconeogenesis regulators are aberrantly upregulated, and glucose transporters are repressed in *Sfrp1*$^{-/-}$ mice fed a HFD. Additionally, we observed increased steatosis in the livers of *Sfrp1*$^{-/-}$ mice. Our findings demonstrate that the expression of *Sfrp1* is a critical factor required for maintaining appropriate cellular signaling in response to the onset of obesity.