

Treatment of obesity through the inhibition of CaMKII

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Technology description

Summary

During nutrient deprivation, the liver produces glucose through a process known as hepatic glucose production (HGP). Excessive glucose production via HGP is thought to play a role in the high blood glucose levels observed in patients suffering from obesity and type II diabetes. The enzyme CaMKII, which has previously been linked to Alzheimer's disease and heart arrhythmia, has been shown to play a role in the signaling pathway that causes HGP. This technology provides a method to treat obesity and related metabolic disorders by reducing the activity of CaMKII, and consequently, HGP and blood glucose levels.

Inhibition of CaMKII enzyme leads to reduction in blood glucose and improves blood glucose management strategies

By inhibiting CaMKII activity, this technology may lead to improvements in the health of those afflicted with obesity, metabolic syndrome, and type II diabetes. It has been shown that CaMKII activity is elevated in obese patients, but not in those with a healthy body mass index. Similar CaMKII activity trends have been observed in mice, and inhibition of CaMKII in obese mice has been shown to lead to decreased blood glucose levels, increased insulin sensitivity, decreased HGP gene expression, and decreased fatty liver and inflammation. Thus, CaMKII is a promising target for therapeutics to treat obesity and associated metabolic disorders.

Lead Inventors:

Publications

Ozcan L, Wong CCL, Li G, Xu T, Pajvani U, Park SKR, Wronska A, Chen BX, Marks AR, Fukamizu A, Backs J, Singer HA, Yates JR III, Accili D, Tabas I, & Calcium Signaling through CaMKII Regulates Hepatic Glucose Production in Fasting and Obesity; Cell Metabolism. 2012 May 2;15(5):739-751.

Application area

Development of drugs that inhibit CaMKII to treat obesity and associated metabolic disorders (e.g. type II diabetes)

Target for treatment of heart arrhythmias

Weight loss supplement in addition to diet and exercise

Advantages

Unique therapeutic target that is distinct from currently marketed medications

Can be used in addition to other obesity and diabetic treatments

Well characterized animal models

Institution

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