Innovations
UNIVERSITY OF COLORADO
ANSCHUTZ MEDICAL CAMPUS

Treatment of Metabolic Syndrome and Obesity with HDAC11 Inhibitors

Product

HDAC11 Inhibitor

Indication

Metabolic Syndrome

Value Propositions

- Increases metabolically active brown fat
- Blocks white fat adipogenesis
- Reduce weight gain and improves glucose tolerance

Market

- $24 million—Global metabolic syndrome market (5.2% CAGR 2017-2023)

Intellectual Property

- US & EP PCT pending*
- Available for licensing

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Background on CU4120H

Metabolic syndrome is a condition characterized by abdominal obesity, elevated blood pressure, high blood sugar, high triglycerides, and low levels of good cholesterol. To be diagnosed, a patient must present with at least three of these five symptoms. Around one third of the US population is thought to have metabolic syndrome, and it is known to increase the risk of developing heart disease, diabetes, and stroke. There is interest in developing alternative pharmacotherapy for metabolic disease that will sustain or increase brown adipose tissue (BAT) activity and function. In contrast to white adipose tissue (WAT), which functions mainly to store energy, BAT is metabolically active and has been shown to contribute to energy expenditure in humans. However, current approaches being developed targeting BAT have failed to promote weight loss upon chronic administration.

Technical Innovation

Researchers at the University of Colorado have found that histone deacetylase 11 (HDAC11) inhibitors may be a treatment for metabolic syndrome. They showed that HDAC11 functions as a repressor of the thermogenic gene program in BAT, but HDAC11 inhibitors increases thermogenesis and the conversion of white adipocytes into beige cells which are metabolically more like BAT. In mice, they found that compared with wildtype (WT) controls, animals lacking HDAC11 were lean and displayed enhanced production of metabolically active BAT. HDAC11-deficient mice were also healthy and exhibited reduced weight gain and lipid accumulation in response to high-fat feeding, and improved glucose tolerance. Reduced weight gain in knockout (KO) mice lacking HDAC11 is shown in Figure 1. HDAC11 inhibitors may be an innovative new treatment option for metabolic syndrome. Because HDAC11 has a unique catalytic domain compared with other HDAC isoforms, the findings suggest that selective HDAC11 inhibitors could be developed to increase energy expenditure.

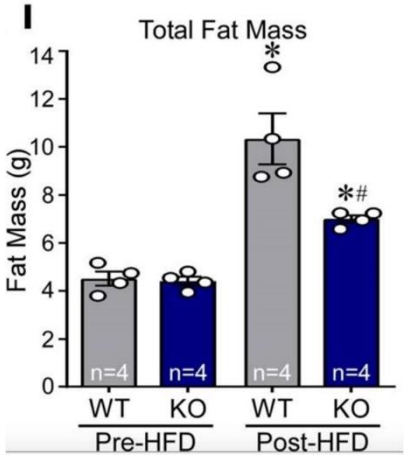

Figure: After being fed a high fat, high sucrose diet (HFD) for 8 days, KO mice displayed reduced fat mass in comparison to WT controls.

***PCT pending:** PCT/US2017/030118—"Compounds and Compositions Useful for Treating Metabolic Syndrome, and Methods Using Same"—Filed April 28th, 2017.*