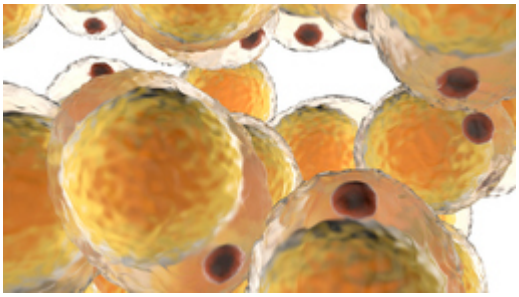
INNOVATION PARTNERSHIPS
UNIVERSITY OF MICHIGAN

HDAC6 Inhibitors to Treat Diabetes

TECHNOLOGY NUMBER: 2021-217



OVERVIEW

A novel means by which to block the histone deacetylase 6 (HDAC6)

- Causes weight loss due to decreased numbers of fat cells in mice
- Provides a means to study and treat patients with diabetes mellitus

MODALITY

Small molecule therapy; administered systemically

INDICATION

Treatment of diabetes mellitus and obesity

PUBLICATIONS

"Histone deacetylase 6 inhibition restores leptin sensitivity and reduces obesity"

INTELLECTUAL PROPERTY

Patent pending

BACKGROUND

Leptin is a hormone released by the body that helps to maintain normal weight and metabolic processes on a long-term basis. Blood levels of leptin correlate directly with percent body fat, and it regulates energy balance through influences on the brainstem and hypothalamus. Increased levels of body fat normally cause higher serum concentrations of leptin, though the body may eventually become resistant to leptin and negate its feedback effects on hunger. The

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resulting body fat dysregulation comes to create abnormalities in other metabolic functions such as maintenance of blood sugar levels. As such, a need exists for additional means by which to study and influence the behavior of leptin in patients with obesity and diabetes mellitus.

INNOVATION

Researchers have identified a novel means by which to block the activity of a histone named deacetylase 6 (HDAC6) inside fat cells to improve the brain's ability to sense leptin, thereby decreasing obesity and its related health disorders such as diabetes in mice. Though the body normally becomes insensitive to leptin with increasing levels of obesity, the investigators found a way for mice to regain sensitivity to leptin and improve metabolic health. Mice treated with the HDAC6 inhibitor experienced weight loss due almost entirely from decreases in the amount of fat tissue with little corresponding change in lean muscle mass. HDAC6 inhibitors reduce food intake, fat mass, hepatic steatosis and improve systemic glucose homeostasis in an HDAC6-dependent manner. The treated mice were specifically noted to show improvements in glucose tolerance, indicating that they had become less likely to develop diabetes mellitus. Overall, this invention provides a basis by which further research may be undertaken to treat patients with obesity and diabetes.