Drug Repurposing for Treatment of Fatty Liver Disease and Diabetes

Tech ID: 31840 / UC Case 2020-146-0

BACKGROUND

Nonalcoholic fatty liver disease (NAFLD) is a condition in which excess fat is stored in the liver, though not caused by heavy alcohol use. NAFLD is one of the most common causes of liver disease in the United States. NAFLD it typically asymptomatic but when NAFLD advances, it can result in the development of NASH (Nonalcoholic steatohepatitis) where inflammation and fibrosis are widespread in the liver, resulting in nonalcoholic steatohepatitis and liver cirrhosis. Mechanisms of NAFLD progression are poorly understood. Experts estimate that about 20% of people with NAFLD have NASH. Between 30% and 40% of adults in the United States have NAFLD. About 3% to 12% of adults in the United States have NASH.

There are no existing FDA-approved therapies for nonalcoholic fatty liver disease (NAFLD). NAFLD it typically asymptomatic but it can progress to nonalcoholic steatohepatitis and liver cirrhosis. Mechanisms of NAFLD progression are poorly understood. There are many FDA-approved therapies for type 2 diabetes, including metformin, insulin, sulfonylureas, Glp-1 receptor agonists, Dpp-4 inhibitors, and Sglt2 inhibitors. These drugs work through diverse mechanisms such as increasing insulin secretion (sulfonylureas, Glp-1 receptor agonists, Dpp-4 inhibitors), direct insulin replacement (insulin), reducing glucose production by the liver (metformin), and stimulating excretion of glucose into urine (Sglt2 inhibitors).

TECHNOLOGY DESCRIPTION

Researchers from UC San Diego present a new invention that provides a different approach to treat liver disease and diabetes. More specifically, the present disclosure provides that systemic inhibition of a novel molecule prevents the development of hyperglycemia and NAFLD. In certain situations, the present invention provides systemic inhibition that prevents various manifestations of the metabolic syndrome in diabetic *db/db* mice, suggesting that targeting this novel target could be used as a therapeutic in type 2 diabetes and NAFLD patients.

APPLICATIONS

Treatment of nonalcoholic fatty liver disease and/or type 2 diabetes

ADVANTAGES

This represents a new approach to for the treatment off fatty liver disease and diabetes for which there are no existing FDA-approved therapies for these diseases.

STATE OF DEVELOPMENT

Experimental stage: validation in preclinical models.

INTELLECTUAL PROPERTY INFO

The invention is patent-pending and is available for licensing and collaborations.

PATENT STATUS

Patent Pending

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OTHER INFORMATION

KEYWORDS

Therapeutics, type 2 diabetes, nonalcoholic fatty liver disease, inhibitor, NAFLD, NASH

CATEGORIZED AS

- **Medical**
  - Disease: Cardiovascular and Circulatory System
  - Disease: Metabolic/Endocrinology
  - Therapeutics

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