The Therapeutic Use of Human Oligosaccharides to Treat Atherosclerosis and/or Hyperlipidemia

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BACKGROUND

In the United States and most other developed countries, atherosclerosis is the leading cause of illness and death. In 2015, cardiovascular disease, primarily coronary artery disease (atherosclerosis that affects the arteries supplying blood to the heart) and stroke, caused almost 15 million deaths worldwide, making atherosclerosis the leading cause of death worldwide.

Atherosclerosis means hardening of the arteries due to the presence of plaques, which are deposits of fatty materials. Atherosclerosis can affect the medium-sized and large arteries of the brain, heart, kidneys, other vital organs, and legs. Atherosclerosis begins when an injured artery wall creates chemical signals that cause certain types of white blood cells (monocytes and T cells) to attach to the wall of the artery. These cells move into the wall of the artery. There they are transformed into foam cells, which collect cholesterol and other fatty materials and trigger growth of smooth muscle cells in the artery wall. In time, these fat-laden foam cells accumulate. They form patchy deposits (atheromas, also called plaques) covered with a fibrous cap in the lining of the artery wall. With time, calcium accumulates in the plaques. Plaques may be scattered throughout medium-sized and large arteries, but they usually start where the arteries branch. Existing treatment options for atherosclerosis and cardiovascular disease are aimed at lowering Low-density lipoprotein (LDL) cholesterol by either increasing hepatic LDLR expression by using statins and PCSK9 inhibitors, or by reducing cholesterol absorption by using ezetimibe. Further development of therapeutic strategies is warranted due to various drawbacks and limitations using the current therapeutic options.

TECHNOLOGY DESCRIPTION

Researchers at UC San Diego have discovered that the use of a unique sugar molecule found in human breast milk that can be used to attenuate hyperlipidemia, including hypercholesterolemia, hypertriglyceridemia and a combination of both.

APPLICATIONS

This invention provides a method of treating or attenuating atherosclerosis and/or hyperlipidemia in a subject in need thereof comprising administering a composition comprising therapeutically effective amounts of one or more human milk-based oligosaccharides.

ADVANTAGES

The proposed use of human milk oligosaccharides (HMOs) for treating atherosclerosis and/or hyperlipidemia and complications resulting therefrom, have notable advantages, including, but not limited to: (a) HMOs are naturally found in human milk, thus, HMOs are safe for human consumption; (b) HMOs can be administered orally; (c) can be used safely with pregnant women with cardiovascular disease.

STATE OF DEVELOPMENT

Current studies have shown that oligosaccharides can attenuate hyperlipidemia and atherosclerosis in mice models

INTELLECTUAL PROPERTY INFO

This technology is patent pending and available for licensing.

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OTHER INFORMATION

KEYWORDS
Cholesterol, LDL, therapeutics, triglyceride, VLDL, HMO, human milk oligosaccharides, hyperlipidemia

CATEGORIZED AS
- **Medical**
  - Disease: Cardiovascular and Circulatory System
  - Therapeutics

RELATED CASES
2018-223-0

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	20190269713	09/05/2019	2018-223

Additional Patent Pending

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