Diagnosis and Treatment of Inflammatory Disease by Glycan Profiling of High Density Lipoprotein (HDL)

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ABSTRACT

Researchers at the University of California, Davis have developed a method for diagnosing an individual patient's risk of inflammatory disease based on glycan profiling of high density lipoprotein (HDL). The resulting profile is then used to recommend a treatment program of dietary, lifestyle, or pharmaceutical interventions (or combination thereof), to improve health and decrease the risk of inflammation-induced disease by modulating the patient's HDL glycosylation pattern.

FULL DESCRIPTION

High density lipoprotein (HDL) is known for its role in removing "bad cholesterol" and reducing the risk of heart disease. HDL has also been linked to inflammation and immune function. The functional capacity of HDL as it relates to its glycan composition however has never before been examined or characterized. This makes glycoprofiling of HDL proteins a potentially powerful tool for developing personalized biomarkers for the diagnosis and treatment of inflammatory diseases.

Researchers at the University of California, Davis have developed a method to diagnose an individual's risk of inflammatory disease by measuring glycosylation levels of specific HDL proteins. Measurements from a patients' blood sample are used to develop an HDL glycosylation profile that reflects the patient's HDL's immunomodulatory functional capacity. The profile values are then compared to control values representing healthy, and diseased populations, to assess the patient's risk of inflammatory disease. A course of treatment (including diet, lifestyle, and other interventions) can then be recommended to positively alter the HDL glycan composition, improve HDL immunomodulatory function, and improve the patient's health. This methodology breaks new ground by demonstrating a compositional aspect of HDL that is related to its immunomodulatory function, and applying that knowledge through a personalized approach to treating inflammatory disease.

APPLICATIONS

- Diagnosis, prevention, and treatment of inflammatory disease

FEATURES/BENEFITS

- Individualized profile of HDL glycosylation indicating inflammatory disease risk
- Personalized recommendations for the prevention and treatment of inflammatory disease

RELATED MATERIALS

- Krishnan S, Shimoda M, Sacchi R, et al. HDL Glycoprotein Composition and Site-Specific Glycosylation Differentiates Between Clinical Groups and Affects IL-6 Secretion in Lipopolysaccharide-Stimulated Monocytes. Scientific Reports. 2017;7:43728. doi:10.1038/srep43728. - 03/13/2017

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	12,055,553	08/06/2024	2017-562

INVENTORS

- Lebrilla, Carlito B.
- Maverakis, Emanual

OTHER INFORMATION

KEYWORDS

high density lipoprotein, HDL, inflammatory disease, glycan, glycosylation, immune modulation

CATEGORIZED AS

- **Biotechnology**
  - Health
- **Medical**
  - Disease: Metabolic/Endocrinology
  - Screening

RELATED CASES

2017-562-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Prebiotic Oligosaccharides
- Glycan Age Prediction Model
- Additional Glycosyl Hydrolase is Critical to Bacteria's Ability to Consume HMOs

▶ Glycoprotein Cleaving Enzyme Isolated from Bifidobacteria

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