Novel Gut Microbiome-based Diagnostic and Therapeutic for Neonates at Risk of Childhood Atopy and Asthma

Tech ID: 29339 / UC Case 2018-087-0

INVENTION NOVELTY

UCSF researchers have developed a novel gut microbiome-based diagnostic test and targeted treatment for early-life identification of atopy or asthma risk in children.

VALUE PROPOSITION

Asthma currently affects more than 300 million people worldwide and is the most prevalent childhood disease in western countries. 1 in 12 children in the US aged 0-17 suffer from Asthma. Poorly controlled and undiagnosed asthma in small children can result in trips to the emergency room, hospital stays, missed workdays for parents and suffering that can quickly turn life-threatening. Childhood asthma is currently predicted using the modified asthma predictive index (mAPI), which, using risk factors from the first three years of life, predicts asthma in school aged children. This invention leverages observations that risk of childhood atopy and asthma is characterized by specific changes in functional genes and products of the neonatal gut microbiome, to devise a diagnostic test that effectively identifies children at high risk of atopy and asthma as early as one-month of age.

This technology provides the following advantages:

- Ability to **identify children at risk for developing atopy and asthma as early as one-month of age**. This would provide the invaluable opportunity for early intervention to prevent disease development.
- **Non-invasive and easy to perform in children**, as it utilizes fecal samples for analysis.
- **Uses well-established, inexpensive and trusted assays,** like LC-MS and qPCR for sample analysis.

TECHNOLOGY DESCRIPTION

Researchers at University of California, San Francisco have developed a diagnostic test that uses measurements of the copy numbers of three bacterial genes and the level of a bacterial metabolite, in conjunction with known early-life risk factors to identify children at high-risk for developing atopy and asthma and developed targeted treatment. This data is used to calculate an asthma/atopy prediction score, which effectively quantifies the risk of developing these diseases by age two for atopy, and age four for asthma.

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OTHER INFORMATION

KEYWORDS

Atopy, Asthma, Children, Neonates, Microbiome, Diagnostic test, Fecal testing, Early intervention, Therapeutics

CATEGORIZED AS

- **Medical**
  - Diagnostics
  - Disease: Autoimmune and Inflammation
  - Disease: Respiratory and Pulmonary System
  - Therapeutics

RELATED CASES

2018-087-0, 2018-198-0

LOOKING FOR PARTNERS

To develop and commercialize this technology as a clinical diagnostic test for early detection of atopy and asthma risk, in early infancy and targeted treatment.

STAGE OF DEVELOPMENT

Preclinical

DATA AVAILABILITY

Under NDA/CDA

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	12,018,327	06/25/2024	2018-087

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