# Breast Milk Biomarkers for Child Chronic Health Disorders

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## BACKGROUND

Autism Spectrum Disorder (ASD) is a developmental disorder associated with difficulties in social interaction and communication as well as repetitive behavior. ASD is thought to be the result of genetic and environmental factors that affect approximately 1 in 59 children in the US, and 25 million people worldwide. The current method of diagnosis for ASD involves evaluations and tests performed by a team of specialists. The latest forms of diagnosis can detect ASD as early as 18 months. However, more standard methods take until 4 years of age before the diagnosis of ASD is confirmed.

There remains an unmet need to develop a reliable and accurate diagnostic methods for early detection for a child at risk with chronic and/or developmental disorders, such as ASD, so that an early intervention measures will be applied before the first symptoms appear.

## TECHNOLOGY DESCRIPTION

Researchers at UC San Diego have discovered a number of biomarkers in breast milk and methods of testing such biomarkers in human breast milk with metabolomic and exposomic approaches to identify children at risk for chronic and/or developmental disorders. The invention identifies a set of 5-15 biomarkers identified in the human breast milk that can be used as a multi-analyte classifier to estimate the risk of developing this chronic childhood disorder. In addition, the invention also provides advanced metabolomic and exposomic methods utilizing breast milk as a source of biomarkers to predict a future risk of complex, multifactorial, childhood chronic illness and/or developmental disorders.

The breast milk biomarker analysis of this invention could become an integral part of universal newborn screening of every child at risk for developmental disorders, such as ASD, or childhood chronic disorders by age 3-10 years, thus, further provides the opportunity for early intervention measures and/or treatment for those children at risk before the first symptoms appear.

## APPLICATIONS

Human breast milk should be collected when a child is 2-9 months old and at the time of routine well-baby checkups to predict the future risk of neurodevelopmental disorders such as autism spectrum disorder (ASD). This will permit early intervention measures to be applied before the first symptoms appear, possibly allowing physicians to prevent as much as half of all ASD before it starts. If validated, breast milk biomarker analysis could become an integral part of universal newborn screening of every child born in the US.

## ADVANTAGES

No one has used advanced metabolomic and exposomic methods on human breast milk as a source of biomarkers to predict the future risk of complex, multifactorial, childhood chronic illness before the first symptoms appear.

## STATE OF DEVELOPMENT

The invention is at the experimental stage.

## INTELLECTUAL PROPERTY INFO

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

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## OTHER INFORMATION

### KEYWORDS

Breast milk biomarkers, metabolomics, exposomics, universal newborn screening, autism spectrum disorder, childhood developmental disorders

### CATEGORIZED AS

- **Medical**
  - Diagnostics
  - Research Tools
- **Research Tools**
  - Screening Assays

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