



ECHO

Environmental influences
on Child Health Outcomes

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Study Summary

ECHO Cohort Research Investigates Relationship Between Infant Gut Microbiome and Childhood Autism-related Traits

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Who sponsored this study?

The Environmental influences on Child Health Outcomes (ECHO) Program, Office of the Director, National Institutes of Health supported this research.

Why was this study needed?

The relationship between a person's gut bacteria and the brain during early childhood, especially from birth to around age three years, helps the immune and nervous systems develop and function. The gut microbiome could be a promising area of research to understand the development of autism-related traits. Previous studies have found links between gut bacteria and social traits, but the results are not the same in different populations. To include a broader population of children in the U.S., researchers in this study sought to identify gut bacteria linked to social traits and brain development in two ECHO Cohort Study Sites.

What were the study results?

Researchers found that certain features of the gut microbiome of infants were associated with higher scores on the Social Responsiveness Scale-2 (SRS-2), a questionnaire that measures autism-related traits. Specifically, certain bacteria and their functional genes, particularly those related to the production of short-chain fatty acids, were linked to autism-related traits. These associations varied between sex and age groups.

Note: Results reported here are for a single study. Other or future studies may provide new information or different results. You should always consult with a qualified healthcare provider for diagnosis and for answers to your personal questions.

What was the study's impact?

Understanding the potential likelihood of autism-related traits through the lens of the gut-brain axis opens new avenues for targeted interventions in early life.

Who was involved?

Researchers studied 481 samples from 304 healthy child participants from two ECHO Cohort study sites in New Hampshire and Rhode Island. The children were between 6 weeks old and 2 years old when they provided stool samples and between 3 and 19 years old when social traits were assessed.

What happened during the study?

The researchers compared groups of participants from two different study sites, focusing on their gut microbiomes when they were younger and social traits related to ASD at a later age. Both study sites contributing to this analysis had previously sequenced bacterial DNA from fecal samples collected from infants or toddlers. They calculated how common certain bacteria were in each sample and related that to the participant's social behavior scores.

What happens next?

Future studies could explore interventions that could change the gut bacteria and potentially influence how the brain develops. Researchers also plan to investigate the influence of the developing gut microbiome on other neurobehavioral outcomes, such as anxiety and depression.

Where can I learn more?

Access the full journal article, titled "Prospective Association of the Infant Gut Microbiome with Social Behaviors in the ECHO Consortium," in [Molecular Autism](#).

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