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Precision microbial intervention improves social behavior in autistic children

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ABSTRACT

Treatments for Autism spectrum disorder (ASD), which is characterized by impairments in social interaction, deficits in communication and the presence of restricted/repetitive behaviors, remain elusive. The gut-microbiota-brain axis is an emerging potential new therapeutic target. Specifically, preclinical studies show that L. reuteri selectively reversed social deficits in several models of ASD. In a double-blind, randomized, placebo-controlled trial, we found that a combination of Lactobacillus strains did not alter overall autism severity or restricted/repetitive behaviors, but considerably improved social functioning across different measures in children with ASD. Intriguingly, we found that the prosocial effect of probiotic treatment was strain-specific in a preclinical ASD mouse model. Collectively, our findings indicate that probiotic treatment improves social behavior in ASD children, thereby warranting larger trials. Moreover, we analyzed several biological factors, such as microbiome composition or immune profile, and we performed correlative studies with behavioral improvement to find potential factors associated with probiotic response.These correlative studies are helpful for improving diagnosis and treatment. In fact, our results offer potential as biomarkers to reduce the diagnostic heterogeneity, and improve the prediction of treatment response.