GenBio CSO Professor Lindsay Brown Drills Down into the Autism Spectrum Disorder

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ALISO VIEJO, CA, UNITED STATES, June 30, 2025 /EINPresswire.com/ -- The Global Burden of Disease 2021 report estimated that 1 in 127 people or 61.8 million were on the autism spectrum (ASD) globally, leading to a burden of 11.7 million disability- adjusted life years. The non-fatal health burden of ASD as a developmental condition includes persistent difficulties in social interaction, challenges with sensory perception, and repetitive behaviours.

> I know of nobody who is purely autistic, or purely neurotypical. Even God has some autistic moments, which is why the planets spin."
>
> *Jerry Newport*

The causes of ASD are very complex, including genetic and epigenetic changes, environmental factors such as increased maternal age, maternal characteristics of metabolic syndrome, changes in the gut microbe-brain axis, medication exposure such as the antidepressant valproic acid and the effects of infection, oxidative stress and inflammation. These causes underlie the heterogeneity in the aetiology, phenotype and outcome of ASD. Treatment for ASD mainly includes ongoing behavioural and educational interventions but there are no pharmacological interventions that target the core ASD symptoms.

The gut-brain axis allows the brain to regulate gastrointestinal function while the gut microbiome regulates the brain by immune, neuroendocrine and vagal pathways. Molecules that regulate the brain derived from the gut microbiome include lipopolysaccharide, short- chain fatty acids, vitamins including the B-group, neurotransmitters such as pro-inflammatory cytokines, intestinal hormones and tryptophan metabolites such as 5-hydroxytryptamine (5-HT) and kynurenine. Enteroendocrine cells (EC) in the gut produce 95% of the body's 5-HT; chronic exposure to the

gut microbiota increases 5-HT synthesis by an increased EC proliferation. Changes to the gut microbiome may also be relevant to maternal influences on ASD. These changes are not unique to ASD but may contribute to many brain health issues including depression, anxiety and neurodegenerative disorders.

Modifying gut microbiota in ASD by dietary modulation may decrease gastro-intestinal dysfunction and improve behaviour. However, eating disorders combined with tantrums and behavioural problems are common in ASD children so dietary modulation will not always be feasible. The importance of the gut microbiota is shown by Microbiota Transfer Treatment as a potential therapy for ASD; in 18 children, follow-up after 2 years showed that improvements in gastro-intestinal symptoms were maintained while further improvements in autism-related symptoms were measured. Prebiotics and synbiotics may produce improvements for some behavioural and gastrointestinal symptoms in ASD but the evidence should be expanded. Further, there is evidence for benefits of probiotics in children with ASD showing behavioural and gastrointestinal improvements.

Bachelor of Pharmacy (University of Queensland), PhD (University of Sydney); post-doctoral experience in Munich, lecturer, senior lecturer, associate professor in pharmacology, University of Queensland 1986-2009; Professor of Biomedical Sciences,

Jerry Newport always knew there was something wrong with him. But as he was growing up, he didn't know what it was

Dietary nutraceuticals include the anthocyanins as the purple, red and blue colours in many fruits, including Queen Garnet and Davidson's plums. The anthocyanins produce anti-inflammatory and antioxidant responses and change the gut microbiome. Treatment with an anthocyanin-containing extract from blueberries decreased neuroinflammation and gut inflammation, modulated the gut microbiota and improved 5-HT concentrations in the gut and prefrontal cortex to ameliorate autism-like behaviours in a valproic acid mouse model of autism. Clinical trials of anthocyanins in patients with cognitive impairment in mild Alzheimer's disease have shown improved vascular responses. While these limited clinical trials with

anthocyanins in mental health issues are important, they need to be extended to long-term but expensive trials as part of treatment for ASD patients.

There are many changes that could improve life outcomes for autistic people and further research on chronic interventions with anthocyanins during pregnancy and in childhood would seem to be justified.

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