Studies on Neurological Disorders, Neuropsychiatric Disorders and Gut Microbiome

STUDIES

1. Systematic Review Of Probiotics As An Adjuvant Treatment For Psychiatric Disorders

This review evaluates the current literature investigating the effects of adjuvant **probiotic or synbiotic** administration in combination with first-line treatments for psychiatric illnesses.

The findings of the studies included in this review suggest that use of adjuvant probiotic treatment with selective **serotonin reuptake inhibitors (SSRIs) for Major Depressive Disorder (MDD)** and **Generalized Anxiety Disorder (GAD)** is superior to SSRI treatment alone. Probiotic adjuvant treatment with antipsychotics could be beneficial for improving the tolerability of the antipsychotics, but these findings do not suggest that adjuvant probiotic treatment would result in improved clinical outcomes for symptoms of schizophrenia.

Source: Evan Forth, Department of Psychiatry, Providence Care Hospital; Centre for Neuroscience Studies, Queen's University and Department of Psychiatry, Kingston, Canada. Systematic Review Of Probiotics As An Adjuvant Treatment For Psychiatric Disorders, Front. Behav. Neurosci., 09 February 2023, Volume 17 – 2023. DOI: https://doi.org/10.3389/fnbeh.2023.1111349.

2. Gut Microbiota, An Additional Hallmark Of Human Aging And Neurodegeneration

This review summarizes the emerging evidence in the literature regarding the link between the oral and gut microbiome and neurodegeneration with a focus on Alzheimer's disease (AD). Taxonomic features of bacteria as well as microbial functional alterations associated with AD biomarkers are the main points reviewed. Data from clinical studies as well as the link between microbiome and clinical determinants of AD are particularly emphasized.

Further, relationships between gut microbiota and age-dependent epigenetic changes and other neurological disorders are also described. All this evidence suggests that gut microbiota can be seen as an additional hallmark of human aging and neurodegeneration.

Source: M. Victoria Moreno-Arribas, Instituto De Investigación En Ciencias De La Alimentación (CIAL), CSIC-UAM. C/ Nicolás Cabrera, Spain. Gut Microbiota, An Additional Hallmark Of Human Aging And Neurodegeneration. Neuroscience, Volume 518, 10 May 2023, Pages 141-161. DOI: Https://Doi.Org/10.1016/J.Neuroscience.2023.02.014.

3. Gut Microbiota And Its Metabolites In Depression: From Pathogenesis To Treatment

This review describes the association between dysbiosis and depression, drug–microbiota interactions in antidepressant treatment, and the potential health benefits of microbial-targeted therapeutics in depression, including dietary interventions, fecal microbiota transplantation, probiotics, prebiotics, synbiotics, and postbiotics. Further, this article also describes a new direction for future research and clinical treatment of depression.

Source: Peng Xie, NHC Key Laboratory Of Diagnosis And Treatment On Brain Functional Diseases, The First Affiliated Hospital Of Chongqing Medical University, China. Gut Microbiota And Its Metabolites In Depression: From Pathogenesis To Treatment. EBioMedicine, 2023 Apr:90:104527. DOI: https://doi.org/10.1016/j.ebiom.2023.104527.

4. Effect Of Probiotic Supplementation On Gut Microbiota In Patients With Major Depressive Disorders: A Systematic Review

This review includes seven clinical trials and involves patients with major depressive disorder (MDD).

Researchers found that probiotic supplementation yielded only modest effects on depressive symptoms and there were no consistent effects on gut microbiota diversity, and in most instances, no significant alterations in gut microbiota composition were observed after four to eight weeks of probiotic intervention.

There is also a lack of systematic reporting on adverse events and no good longer-term data. Patients with MDD may require longer time to show clinical improvement and the microbial host environment may also need longer than eight weeks to produce significant microbiota alterations. Further, larger-scale and longer-term studies are required.

Source: Qin Xiang Ng, Health Services Research Unit, Singapore General Hospital And MOH Holdings Pte Ltd., Maritime Square, Singapore. Effect Of Probiotic Supplementation On Gut Microbiota In Patients With Major Depressive Disorders: A Systematic Review. Nutrients 2023, 15(6), 1351. DOI: https://doi.org/10.3390/nu15061351.

5. Adjunct Therapy With Probiotics For Depressive Episodes Of Bipolar Disorder Type I: A Randomized Placebo-Controlled Trial

In this randomized placebo-controlled trial, scientists randomly assigned 98 patients with depressive bipolar disorder type I (BD-I) to receive the combined treatment of probiotics (***Bifidobacterium animals subsp. lactis*** *BAMA-Bo6/BAu-Bo111*, 2 g/day) (N = 49) and conventional medications, or conventional medications along with placebo (***maltodextri***n, 2 g/day) (N = 49).

Researchers concluded that the probiotics adjuvant therapy can enhance the efficacy of the conventional medications of depressive bipolar disorder type-1 (BD-1) and reduce the metabolic side effects

Source: Ting-Tao Chen,Department Of Psychiatry, The First Affiliated Hospital Of Nanchang University, Nanchang, Jiangxi, China. Adjunct Therapy With Probiotics For Depressive Episodes Of Bipolar Disorder Type I: A Randomized Placebo-Controlled Trial. Journal of Functional Foods, Volume 105, 2023,105553, ISSN 1756-4646. DOI: https://doi.org/10.1016/j.jff.2023.105553.

6. Microbiome And Tryptophan Metabolomics Analysis In Adolescent Depression: Roles Of The Gut Microbiota In The Regulation Of Tryptophan-Derived Neurotransmitters And Behaviors In Human And Mice

This study is the first to delineate the beneficial effects of ***Roseburia intestinalis (Ri.)*** on adolescent depression by balancing ***tryptophan*** (***Trp)-derived neurotransmitter*** metabolism and improving synaptogenesis and glial maintenance, which may yield novel insights into the microbial markers and therapeutic strategies of gut-brain axis (GBA) in adolescent depression.

Source: Rong Gao, Department Of Hygienic Analysis And Detection, The Key Laboratory Of Modern Toxicology Of Ministry Of Education, School Of Public Health, Nanjing Medical University, China. Microbiome And Tryptophan Metabolomics Analysis In Adolescent Depression: Roles Of The Gut Microbiota In The Regulation Of Tryptophan-Derived Neurotransmitters And Behaviors In Human And Mice. Microbiome 11, 145 (2023). DOI: https://doi.org/10.1186/s40168-023-01589-9 .

7. Mapping Research Trends And Hotspots In The Link Between Alzheimer's Disease And Gut Microbes Over The Past Decade: A Bibliometric Analysis

The current review utilized bibliometric analysis to map research trends and identify hotspots linked to Alzheimer's Disease (AD) and the gut microbiome. The researchers aimed to provide important insights into the dynamic trends, intellectual structure, and prospective hotspots in this domain, which will help guide future research in the right direction.

Researchers found that in the past decade, research linked to gut microbiota and Alzheimer's Disease (AD) is progressing rapidly. They have also found that the recent studies are more focused on determining the role of short chain fatty acids (SCFA), gut-brain axis, neuroinflammation, and oxidative stress in AD. Further, the emerging gut microbial targeted therapy has shown significant promise to combat AD.

Source: Yanqing Wang, Department Of Physiology, School Of Basic Medical Sciences, Cheeloo College Of Medicine, Shandong University, China. Mapping Research Trends And Hotspots In The Link Between Alzheimer's Disease And Gut Microbes Over The Past Decade: A Bibliometric Analysis. Nutrients 2023, 15(14), 3203. DOI: https://doi.org/10.3390/nu15143203.

8. Gut Microbiome Composition May Be An Indicator Of Preclinical Alzheimer's Disease

Alzheimer's disease (AD) pathology is thought to progress from normal cognition through preclinical disease and ultimately to symptomatic AD with cognitive impairment. This cross-sectional study accounted for clinical covariates and dietary intake.

Researchers compared the taxonomic composition and gut microbial function in a cohort of 164 cognitively normal individuals. And found out that out of 164 only 49 participants showed biomarker evidence of early preclinical AD. Gut microbial taxonomic profiles of individuals with preclinical AD were distinct from those of individuals without evidence of preclinical AD. The change in gut microbiome composition correlated with β-amyloid (Aβ) and tau pathological biomarkers but not with biomarkers of neurodegeneration, suggesting that the gut microbiome may change early in the disease process.

Scientists also identified specific gut bacterial taxa associated with preclinical AD. Inclusion of these microbiome features improved the accuracy, sensitivity, and specificity of machine learning classifiers for predicting preclinical AD status when tested on a subset of the cohort (65 of the 164 participants). Gut microbiome correlates of preclinical AD neuropathology may improve the understanding of AD etiology and may help to identify gut-derived markers of AD risk.

Source: Gautam Dantas, Edison Family Center For Genome Sciences And Systems Biology,; Department Of Biomedical Engineering, Washington University; Department Of Pathology And Immunology, Division Of Laboratory And Genomic Medicine; Department Of Molecular Microbiology And Department Of Pediatrics, Washington University School Of Medicine, St. Louis, MO, USA. Gut Microbiome Composition May Be An Indicator Of Preclinical Alzheimer's Disease. Sci Transl Med. 2023 Jun 14;15(700):eabo2984. DOI: 10.1126/scitranslmed.abo2984.

9. Genetic Correlations Between Alzheimer's Disease And Gut Microbiome Genera

A growing body of evidence suggests that dysbiosis of the human gut microbiota is associated with neurodegenerative diseases like ***Alzheimer's disease (AD***) via neuroinflammatory processes across the microbiota-gut-brain axis. Scientists used largest genome-wide association study of gut microbiota genera from the MiBioGen consortium.

Researchers initially identified 20 gut microbiota genera which were genetically associated with AD case/control status. Out of these 20, three genera (***Eubacterium fissicatena as a protective factor, Collinsella, and Veillonella as a risk factor***) were independently significant in the replication sample.

Meta-analysis of both samples (discovery and replication) confirmed that ten genera had a significant correlation with AD, four of which were significantly associated with the APOE rs429358 risk allele in a direction consistent with their protective/risk designation in AD association. Notably, the proinflammatory genus ***Collinsella,*** identified as a risk factor for AD, was positively correlated with the APOE rs429358 risk allele in both samples. Overall, the host genetic factors influencing the abundance of ten genera were significantly associated with AD, suggesting that these genera may serve as biomarkers and targets for AD treatment and intervention.

This study results highlight that proinflammatory gut microbiota might promote AD development through interaction with APOE. Larger datasets and functional studies are required to understand their causal relationships.

Source: Jingchun Chen, Nevada Institute Of Personalized Medicine, University Of Nevada, Las Vegas, NV, USA. Genetic Correlations Between Alzheimer's Disease And Gut Microbiome Genera. Sci Rep 13, 5258 (2023). DOI: https://doi.org/10.1038/s41598-023-31730-5.

10. Gut Inflammation Associated With Age And Alzheimer's Disease Pathology: A Human Cohort Study

In this study researchers investigated whether greater gut inflammation is associated with advanced age and Alzheimer's disease (AD) pathology. Scientists assessed fecal samples from older adults to measure calprotectin, an established marker of intestinal inflammation which is elevated in diseases of gut barrier integrity.

Results of the study found that calprotectin levels were elevated in advanced age and were higher in participants diagnosed with amyloid-confirmed AD dementia. Additionally, among individuals with AD dementia, higher calprotectin was associated with greater amyloid burden as measured with 11C-Pittsburgh compound B positron emission tomography (PiB PET).

Exploratory analyses indicated that calprotectin levels were also associated with cerebrospinal fluid markers of AD, and with lower verbal memory function even among cognitively unimpaired participants. ***Hence, these findings suggest that intestinal inflammation is linked with brain pathology even in the earliest disease stages. Moreover, intestinal inflammation may exacerbate the progression toward AD.***

Source: Tyler K. Ulland, Wisconsin Alzheimer's Disease Research Center, University Of Wisconsin School Of Medicine And Public Health And Department Of Pathology And Laboratory Medicine, University Of Wisconsin-Madison, Madison, WI, USA. Gut Inflammation Associated With Age And Alzheimer's Disease Pathology: A Human Cohort Study. Sci Rep 13, 18924 (2023). DOI: https://doi.org/10.1038/s41598-023-45929-z.

11. Lipids, Gut Microbiota, And The Complex Relationship With Alzheimer's Disease: A Narrative Review

This review aims to describe, in an integrative way, the interaction between the gastrointestinal microbiome, lipids, and Alzheimer's Disease (AD), providing valuable insights into how the relationship between these factors affects disease progression, contributing to prevention and treatment strategies.

Source: Karina Braga Gomes, Faculty Of Medicine, Federal University Of Minas Gerais, Professor Alfredo Balena Avenue, 190, Santa Efigênia, Belo Horizonte, MG, Brazil. Lipids, Gut Microbiota, And The Complex Relationship With Alzheimer's Disease: A Narrative Review. Nutrients 2023, 15(21), 4661. DOI: https://doi.org/10.3390/nu15214661.

12. Microbiota From Alzheimer's Patients Induce Deficits In Cognition And Hippocampal Neurogenesis

Patients with Alzheimer's disease (n = 69) and cognitively healthy control subjects (n = 64) were recruited at the IRCCS Centro San Giovanni di Dio Fatebenefratelli, Brescia, Italy. The findings of this study reveal for the first time, that Alzheimer's symptoms can be transferred to a healthy young organism via the gut microbiota, confirming a causal role of gut microbiota in Alzheimer's disease, and highlight hippocampal neurogenesis as a converging central cellular process regulating systemic circulatory and gut-mediated factors in Alzheimer's.

Source: Yvonne M Nolan, Department Of Anatomy And Neuroscience, University College Cork, Ireland. Microbiota From Alzheimer's Patients Induce Deficits In Cognition And Hippocampal Neurogenesis. Brain, Volume 146, Issue 12, December 2023, Pages 4916–4934. DOI: https://doi.org/10.1093/brain/awad303.

13. Current Understanding Of The Alzheimer's Disease-Associated Microbiome And Therapeutic Strategies

In this review, researchers aimed to summarize the current understanding of the microbiota-gut-brain axis in Alzheimer's disease (AD) and also discussed the existing evidence regarding the role of gut microbiota in AD pathogenesis, suggested underlying mechanisms, biological factors influencing the microbiome-gut-brain axis in AD, and remaining questions in the field. Further, scientists discussed the potential therapeutic approaches to recondition the community of gut microbiota to alleviate disease progression.

Source: Dong-Oh Seo, Department Of Neurology, Hope Center For Neurological Disorders, Knight Alzheimer's Disease Research Center, Washington University School Of Medicine, USA. Current Understanding Of The Alzheimer's Disease-Associated Microbiome And Therapeutic Strategies. Exp Mol Med (2024). DOI: https://doi.org/10.1038/s12276-023-01146-2.

14. Multi-Level Analysis Of The Gut–Brain Axis Shows Autism Spectrum Disorder-Associated Molecular And Microbial Profiles

Autism spectrum disorder (ASD) is a neurodevelopmental disorder characterized by heterogeneous cognitive, behavioral and communication impairments. Disruption of the gut–brain axis (GBA) has been implicated in ASD although with limited reproducibility across studies.

In this study, researchers developed a Bayesian differential ranking algorithm to identify ASD-associated molecular and taxa profiles across 10 cross-sectional microbiome datasets and 15 other datasets, including dietary patterns, metabolomics, cytokine profiles and human brain gene expression profiles.

Researchers found that a functional architecture along the GBA that correlates with heterogeneity of ASD phenotypes, characterized by ASD-associated amino acid, carbohydrate and lipid profiles predominantly encoded by microbial species in the genera ***Prevotella, Bifidobacterium, Desulfovibrio*** and ***Bacteroides*** correlates with brain gene expression changes, restrictive dietary patterns and pro-inflammatory cytokine profiles. The functional architecture revealed in age-matched and sex-matched cohorts is not present in sibling-matched cohorts.

This review shows that there is a strong association between temporal changes in microbiome composition and ASD phenotypes. Further, a framework is required to leverage multi-omic datasets from well-defined cohorts and investigate how the GBA influences ASD.

Source: Gaspar Taronche, Gaspar Taroncher Consulting, Philadelphia, PA And Simons Foundation Autism Research Initiative, Simons Foundation, New York, NY, USA. Multi-Level Analysis Of The Gut–Brain Axis Shows Autism Spectrum Disorder-Associated Molecular And Microbial Profiles. Nat Neurosci 26, 1208–1217 (2023). DOI: https://doi.org/10.1038/s41593-023-01361-0.

15. Probiotics For Neurodegenerative Diseases: A Systemic Review

This systematic review provides an overview of the available data, bacterial variety, gut-brain axis defects, and probiotics' mode of action in averting neurodegenerative disorders (ND).

Source: Prashant Kaushik, Instituto De Conservacióny Mejora De La AgrodiversidadValenciana, Universitat Politècnica De València, Valencia, Spain. Probiotics For Neurodegenerative Diseases: A Systemic Review. Microorganisms 2023, 11(4), 1083. DOI: https://doi.org/10.3390/microorganisms11041083.

16. Gut Microbiota In Dementia With Lewy Bodies

Gut microbiota and fecal bile acids were analyzed in 278 patients with ***α-synucleinopathies***, which were comprised of 28 patients with ***dementia with Lewy bodies (DLB),*** 224 patients with ***Parkinson's disease (PD),*** and 26 patients with ***idiopathic rapid eye movement sleep behavior disorder (iRBD).***

Researchers found that similarly to PD, short-chain fatty acids-producing genera were decreased in DLB. Additionally, ***Ruminococcus torques*** and ***Collinsella*** were increased in DLB, which were not changed in PD. Random forest models to differentiate DLB and PD showed that high ***Ruminococcus torques*** and high ***Collinsella***, which presumably increase intestinal permeability, as well as low ***Bifidobacterium***, which are also observed in Alzheimer's disease, were predictive of DLB.

They also found that ***Ruminococcus torques and Collinsella*** are also major secondary bile acids-producing bacteria. Scientists quantified fecal bile acids and found that the production of ***ursodeoxycholic acid (UDCA)*** was high in DLB. Increased UDCA in DLB may mitigate neuroinflammation at the substantia nigra, whereas neuroinflammation may not be *critical* at the neocortex. Further, therapeutic intervention to increase ***Bifidobacteirum*** and its metabolites may retard the development and progression of DLB.

Source: Kinji Ohno, Division Of Neurogenetics, Center For Neurological Diseases And Cancer, Nagoya University Graduate School Of Medicine, Nagoya, Japan. Gut Microbiota In Dementia With Lewy Bodies. Npj Parkinsons Dis. 8, 169 (2022). DOI: https://doi.org/10.1038/s41531-022-00428-2 .

17. Mood Disorders: The Gut Bacteriome And Beyond

In this review article researchers concluded that the '**microbiome revolution**' has been a welcomed addition to the field of psychiatry. Research conducted to date has been critical in developing the understanding of the microbiome-gut-brain axis and its contribution to mood disorder pathophysiology. New frontiers in microbiome science, including the contribution of other organisms, as well as the biological relevance of other microbial niches, are avenues of research that hold promise to further reveal how these mutualistic microorganisms influence mental disorders.

Source: Amelia J. Mcguinness, Deakin University, Geelong, Australia, Food & Mood Centre, The Institute For Mental And Physical Health And Clinical Translation (IMPACT), School Of Medicine And Barwon Health, Geelong, Australia. Mood Disorders: The Gut Bacteriome And Beyond. Biol Psychiatry, 2023 Sep 3:S0006-3223(23)01532-9. DOI: https://doi.org/10.1016/j.biopsych.2023.08.020.

18. Association Between Microbiome And The Development Of Adverse Posttraumatic Neuropsychiatric Sequelae After Traumatic Stress Exposure

Patients exposed to trauma often experience high rates of adverse post-traumatic neuropsychiatric sequelae (APNS). This study aimed to determine whether the gut microbiomes of trauma-exposed emergency department patients who develop APNS have dysfunctional gut microbiome profiles and discover potential associated mechanisms.

Study result shows that microbial species, including ***Flavonifractor plautii, Ruminococcus gnavus and, Bifidobacterium species***, were prevalent commensal gut microbes and they are found to be important in predicting worse APNS outcomes from microbial abundance data.

Researchers found that through APNS outcome modeling using microbial metabolic pathways, worsen APNS, outcomes were highly predicted by decreased L-arginine related pathway genes and increased citrulline and ornithine pathways. Common commensal microbial species are enriched in individuals who develop APNS. They have also identified a biological mechanism through which the gut microbiome reduces global arginine bioavailability, a metabolic change that has also been demonstrated in the plasma of patients with post-traumatic stress disorder (PTSD).

Source: John P. Haran, Department Of Microbiology And Physiologic Systems; Department Of Emergency Medicine And Program In Microbiome Dynamics, University Of Massachusetts Chan Medical School, Worcester, MA, USA. Association Between Microbiome And The Development Of Adverse Posttraumatic Neuropsychiatric Sequelae After Traumatic Stress Exposure. Transl Psychiatry 13, 354 (2023). https://doi.org/10.1038/s41398-023-02643-8.

19. The Gut Microbiome In Children With Mood, Anxiety, And Neurodevelopmental Disorders: An Umbrella Review

Research on the gut microbiome and mental health among children and adolescents is growing. This umbrella review provides a high-level overview of current evidence syntheses to amalgamate current research and inform future directions.

39 review studies were included in the review, 23 (59%) were observational and 16 (41%) were interventional. Most reviews (92%) focused on Autism Spectrum Disorder (ASD). Over half (56%) of the observational and interventional reviews scored low or critically low for methodological quality.

A higher abundance of ***Clostridium*** clusters and a lower abundance of ***Bifidobacterium*** were consistently observed in ASD studies. ***Biotic supplementation was associated with ASD symptom improvement.*** Gut microbiome-mental health evidence syntheses in child and youth depression, anxiety, bipolar disorder, and obsessive-compulsive disorder (OCD) are lacking. Preliminary evidence suggests an association between specific microbiota and ASD symptoms, with some evidence supporting a role for probiotic supplementation ASD therapy.

Source: Daphne J. Korczak, Department Of Psychiatry, Hospital For Sick Children And Department Of Psychiatry, Temerty Faculty Of Medicine, University Of Toronto, Toronto, ON, Canada. The Gut Microbiome In Children With Mood, Anxiety, And Neurodevelopmental Disorders: An Umbrella Review. Gut Microbiome, 2023;4:e18. DOI: DOI: https://doi.org/10.1017/gmb.2023.16.

20. Role Of Gut Microbiota In Neurological Disorders And Its Therapeutic Significance

This review discussed the **function of the gut microbiotas (GM) in the gut–brain axis (GBA)** from the gut to the brain and the brain to the gut, the pathways associated with neurology that interacts with the GM, and the various neurological disorders associated with the GM.

Furthermore, it has also highlighted the recent advances and future prospects of the GBA, which may require addressing research concerns about GM and associated neurological disorders.

Source: Rima Dada, Molecular Reproduction And Genetics Facility, Department Of Anatomy, All India Institute Of Medical Sciences (AIIMS), New Delhi. Role Of Gut Microbiota In Neurological Disorders And Its Therapeutic Significance. J. Clin. Med. 2023, 12(4), 1650. DOI: https://doi.org/10.3390/jcm12041650.

21. Relationships Of The Gut Microbiome With Cognitive Development Among Healthy School-Age Children

This study examined the relationship between the intestinal microbiome and cognitive development of school-age children.

Overall, 165 children (41.2% females) aged 6–9 years were enrolled. Socioeconomic Status (SES) score was strongly related to both FSIQ score and the gut microbiome. Measures of ***α-diversity*** were significantly associated with full-scale Intelligence Quotient (FSIQ) score, demonstrating a more diverse, even, and rich microbiome with increased FSIQ score. Significant differences in fecal bacterial composition were found; FSIQ score explained the highest variance in bacterial ***β-diversity***, followed by SES score. Several taxonomic differences were significantly associated with FSIQ score, including ***Prevotella, Dialister, Sutterella, Ruminococcus callidus, and Bacteroides uniformis.***

This study demonstrated significant independent associations between the gut microbiome and cognitive development in school-age children.

Source: Khitam Muhsen, Department Of Epidemiology And Preventive Medicine, School Of Public Health, The Sackler Faculty Of Medicine, Tel Aviv University, Israel. Relationships Of The Gut Microbiome With Cognitive Development Among Healthy School-Age Children. Front. Pediatr., 19 May 2023, Volume 11 – 2023. DOI: https://doi.org/10.3389/fped.2023.1198792.

22. Gut-Resident Microorganisms And Their Genes Are Associated With Cognition And Neuroanatomy In Children

Scientists investigated the relationship between the microbiome and neuroanatomy and cognition of 381 healthy children, demonstrating that differences in microbial taxa and genes are associated with overall cognitive function and the size of brain regions.

Using a combination of statistical and machine learning models, researchers showed that species including ***Alistipes obesi, Blautia wexlerae, and Ruminococcus gnavus*** were enriched or depleted in children with higher cognitive function scores. Microbial metabolism of short-chain fatty acids was also associated with cognitive function. In addition, machine models were able to predict the volume of brain regions from microbial profiles, and taxa that were important in predicting cognitive function were also important for predicting individual brain regions and specific subscales of cognitive function. These findings provide potential biomarkers of neurocognitive development and may enable development of targets for early detection and intervention.

Source: Vanja Klepac-Ceraj, Department Of Biological Sciences, Wellesley College, Wellesley, MA, USA. Gut-Resident Microorganisms And Their Genes Are Associated With Cognition And Neuroanatomy In Children. Science Advances, 22 Dec 2023, Vol 9, Issue 51. DOI: 10.1126/sciadv.adi0497.

Note: Only lead author's names and their affiliations are given. Please see the articles for full details.
(Disclaimer-ILSI/ ILSI India are not responsible for veracity of any statement or finding)