Microbes have potential to reverse aging in the brain

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Researchers at APC Microbiome in UCC have discovered the potential to reverse aging in the brain – Pictured are Professor John Cryan, Dr. Marcus Boehme, Katherine Guzzetta, Dr. Thomaz Bastiaanssen.The UCC researchers at APC Microbiome Ireland, a world leading SFI Research Centre, have found that aging-associated changes in the immune system of old mice were reversed by the transfer of gut microbiota from the young mice. The researchers saw improved behavior of older mice in several cognitive tests for learning, memory and anxiety. Credit: Clare Keogh

Research from APC Microbiome Ireland (APC) at University College Cork (UCC) published today in the leading international scientific journal *Nature Aging* introduces a novel approach to reverse aspects of aging-related deterioration in the brain and cognitive function via the microbes in the gut.

As our population ages one of the key global challenges is to develop strategies to maintain healthy brain function. This ground-breaking research opens up a potentially new therapeutic avenues in the form of microbial-based interventions to slow down brain aging and associated cognitive problems.

The work was carried out by researchers in the Brain-Gut-Microbiota lab in APC led by Prof John F. Cryan, Vice President for Research & Innovation, University College Cork as well as a Principal Investigator at APC Microbiome Ireland an SFI Research Centre, based in in University College Cork and Teagasc Moorepark.

There is a growing appreciation of the importance of the microbes in the gut on all aspects of physiology and medicine. In this latest mouse study the authors show that by transplanting microbes from young into old animals they could rejuvenate aspects of brain and immune function. Prof John F. Cryan, says "Previous research published by the APC and other groups internationally has shown that the gut microbiome plays a key role in aging and the aging process. This new research is a potential game changer , as we have established that the microbiome can be harnessed to reverse age-related brain deterioration. We also see evidence of improved learning ability and cognitive function". Although very exciting Cryan cautions that "it is still early days and much more work is needed to see how these findings could be translated in humans".

APC Director Prof Paul Ross stated that "This research of Prof. Cryan and colleagues further demonstrates the importance of the gut microbiome in many aspects of health, and particularly across across the brain/gut axis where brain functioning can be positively influenced. The study opens up possibilities in the future to modulate gut microbiota as a therapeutic target to influence brain health" The study was led by co-first authors Dr. Marcus Boehme along with Ph.D. students Katherine E. Guzzetta, and Thomaz Bastiaansen.

More information: Boehme, M. et al, Microbiota from young mice counteracts selective age-associated behavioral deficits. *Nat Aging* (2021). doi.org/10.1038/s43587-021-00093-9

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