Press Release

Could Fibre be the Ferrari for your Brain?

- Cork Scientists target gut microbes to reverse the effects of ageing in middle age

Middle age is a time of life where various physiological changes occur and can lead to alterations of brain function, including cognitive impairments. However, the mechanisms underpinning such changes are unclear.

Now, new research from scientists at the APC Microbiome Ireland SFI Research Centre in University College Cork has shown that modifying the gut microbes by diet can lessen inflammation in the brain of middle-aged male mice and may positively influence brain ageing and function.

There is growing evidence that microbes in the gut can play a key role in regulating brain functions, particularly emotional processing and behaviour. Prebiotics are non-digestible fibres that promote the growth of beneficial bacteria in the intestines. Inulin is one such prebiotic found in a wide variety of fruits, vegetables, and herbs, including wheat, onions, bananas, leeks, artichokes, asparagus and chicory.

“We wanted to see whether an inulin enriched diet that can modulate the composition of the microbes in the gut could also improve brain health and wellbeing” says Prof. Cryan, leader of this research. “The community of microbes in the gut changes with ageing. Many studies in ageing focus on very old animals and this may be too late to reverse the age-associated changes. We chose middle age in the hope that we could promote healthy ageing”

“Our research shows that a diet supplemented with prebiotics reversed microglia activation in the middle-aged mouse brain towards young adult levels. Moreover, this reversing effect was observed in a key region of the brain which regulates learning and memory, the hippocampus” says Dr. Marcus Boehme. “Microglia are the major immune cells in the brain and have shown to be a key player in neuropsychological and neurodegenerative conditions. Moreover, microglia play a crucial role in brain plasticity and cognition.”

The new research suggests that prebiotic dietary fibres could be developed as a new strategy to promote healthy ageing by protecting brain function and prevent the adverse effects of age-related neuroinflammation.

Perhaps in the future new dietary regimes rather than fancy cars or motorbikes is what is needed for that midlife crisis.

The study led by Professor John F. Cryan, Professor Ted Dinan, Dr. Harriet Schellekens and Dr. Marcus Boehme is published in the leading journal Molecular Psychiatry. This research was
supported by the Science Foundation Ireland Centre grant to the APC Microbiome Ireland and
the European-wide JPI-HDHL-NutriCog project ‘AMBROSIAC’.

Full reference:
“Mid-Life Microbiota Crises: Middle Age is Associated with Pervasive Neuroimmune Alterations
that are Reversed by Targeting the Gut Microbiome” by Marcus Boehme, Marcel van de Wouw,
Thomaz F. S. Bastiaanssen, Loreto Olavarria-Ramirez, Katriona Lyons, Fiona Fouhy, Anna V.
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group, in Molecular Psychiatry https://doi.org/10.1038/s41380-019-0425-1

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About APC Microbiome Ireland

The SFI Research Centre APC Microbiome Ireland (APC; http://apc.ucc.ie ) is a world -leading SFI
Research Centre which was formed in 2003 with funding from Science Foundation Ireland and in
conjunction with key industry partners. It represents a seamless collaboration between
University College Cork and Teagasc (the Irish Agriculture and Food Development Authority). It is
widely recognised that the gut microbiota plays an important role in human health and has
become one of the most dynamic, complex and exciting areas of research in both food and
pharmaceutical arenas. Over the last decade the APC has established itself as one of the leading
global centres in gut microbiota research. The APC has made several landmark discoveries and
has published over 2,500 research articles in peer-reviewed journals, generating many journal
covers and associated editorials. Recent research areas being led by APC include the
development of new diagnostics or biomarkers of health or risk of disease (e.g. colon cancer)
based on analysis of the microbiota; exploring the mechanisms by which the microbiota may be
favourably mobilised or manipulated (e.g. by bacteriophage) to promote health and ‘mining’ the
microbiota for new drugs (e.g. smart antibiotics) and functional food ingredients. APC recently
celebrated 15 years in operation, with the publication of a new report “Mining Microbes for
Mankind - 15 years of Impact”’, produced in tandem with Cork University Business School, which
outlines the impact of APC research on society and on the Irish economy. The Executive Summary
of the report “Mining Microbes for Mankind – 15 years of impact” is available to download at
http://apc.ucc.ie/apc-15-years-impact/

About Molecular Psychiatry

Molecular Psychiatry publishes work aimed at elucidating biological mechanisms underlying
psychiatric disorders and their treatment. The emphasis is on studies at the interface of pre-
clinical and clinical research, including studies at the cellular, molecular, integrative, clinical,
imaging and psychopharmacology levels. Molecular Psychiatry has a high impact factor (11.6) published by Nature and is one of the top journals in Psychiatry.