SCIENCE MEDIA CENTRE MALAYSIA

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Gut feeling is real science: Know your microbiome!

Did you know that more than half of your body is not human? The human cells make up roughly less than half of the body's total cell count, while the rest are microbes. There is an estimate of about 39 trillion bacteria to about 30 trillion human cells. A collection of all microbes, such as bacteria, fungi, viruses, and their genes, that naturally live on our bodies and inside us is called a microbiome. The gut microbiome alone can weigh up to 2kg!

To understand the other half of ourselves, the Science Media Centre (SMC) Malaysia organised a webinar **"Gut feeling is real science: Know your microbiome!"** in conjunction with World Microbiome Day 2020 which was celebrated worldwide on Saturday, June 27.

The speakers including a panel of experts from both Malaysia and Singapore provided insights on the connection of gut microbiome to our health and mental state; how our diet shapes the microbiome; and the latest research on fecal transplant to help grow healthy gut bacteria.

They were Associate Professor Dr Jeremy Lim who is the founder of Asian Microbiome Library (AMiLi), Southeast Asia's first and only stool bank serving as a hub for gut microbiome innovation and therapy based in Singapore, and Dr Chong Chun Wie, Senior Lecturer at School of Pharmacy, Monash University Malaysia who has done extensive research in the Antarctic microbial ecology and human gut microbiome. The webinar was moderated by Dr Mahaletchumy Arujanan, co-founder of Science Media Centre Malaysia.

According to Dr Chong, not just our genetic makeup, but the microbes in the gut can determine our health, thus playing a role in preventing and curing diseases, including mental health disorders.

"Our mental health is controlled by hormones and neurotransmitters such as dopamine and serotonin. Interestingly, bacteria produce these hormones and neurotransmitters. So if you have a change in the bacteria composition, especially these bacteria that can produce these substances, it will affect mood."

"There are already many studies linking changes in microbiome with the different types of mental illness including stress, depression and autism,'' said Dr Chong who is currently researching the microbiome in Parkinson's disease patients.

While each person has a different bacterial microbiome that is unique to their gut, like a bacterial fingerprint, the types of diet and the genetics that we carry also affects the different types of bacteria living inside our gut system.

“Various factors will influence the type of microbe we carry. From birth, we get our microbes from our mothers and along the way as we grow, whether we are breastfed or formula milk, that also shows the distinction between the type of bacteria. The types of diet, Westernised diet vs traditional fibre rich affects the types of microorganisms we carry as well,” said Dr Chong.

Several research has also linked the gut microbiome with non-communicable diseases such as diabetes and obesity.

“Few studies have looked at the difference of microbes across different diseases. Some bacteria have pro-inflammatory properties that are found in patients who have diabetes and obesity,” Dr Chong added.

Although studies of the gut microbiome are fairly recent, Dr Jeremy pointed out that they have produced promising results.

He quoted a classic example of a fecal transplant from an obese mouse into a thin mouse which caused a significant increase in fat and vice-versa.

“Likewise, a recent study in autism where the scientists took a stool from children who had autism and transplanted these into mice and the mice then developed autism syndrome. If we can induce autism in mice, could we reverse the causality and direction and develop an intervention in the gut microbiome that will help children with autism to improve symptoms?”

“It is still very early days but the science is exciting and definitely the opportunity to impact human health is really immense,” he said.n

Fecal microbiota transplants (FMT) also known as Bacteriotherapy is a procedure that transfers stool from a healthy donor to the gastrointestinal tract of another person for the purpose of treating a disease or condition.

It is used to treat recurrent, antibiotic-resistant *Clostridium difficile* infection and is currently being explored as a treatment for many other conditions, including obesity and mental health disorders.

Donating stool for fecal transplants, however, is not a simple process as donors need to go through a stringent procedure.

“Firstly, we must choose the right donor. We have to select donors very carefully and put them through a battery of tests to look for all sorts of infectious diseases. Only after we are sure after all tests are negative and the donor is very healthy, then only they are eligible to be a microbiome donor.”

“Usually only 2-3% of people who stepped up to become a donor actually qualify after undergoing these tests,” he said while still urging donors to donate their stool samples to AMiLi which is Southeast Asia's first and only stool bank.

He also added that much of the bulk of research into microbiomes has been largely focused in the North American and European region, however, it is imperative for Asia to advance its own microbiome research and treatment as they make up an entirely different genetic pool.

Watch the full LIVE session here: https://youtu.be/zIMRZSIhUt4

About us

Science Media Centre (SMC) Malaysia
SMC Malaysia is an independent resource centre under the auspices of the Malaysian Biotechnology Information Centre (MABIC). SMC Malaysia aims to provide evidence-based information to support local journalists to report on complex or controversial science issues that make the headlines. SMC Malaysia is also part of an international network of SMCs around the world such as the UK, New Zealand, Australia, Germany and Canada.

Asian Microbiome Library (AMiLi)
AMiLi is Southeast Asia's first and only stool bank serving as a hub for gut microbiome innovation and therapy. AMiLi's mission is to advance microbiome research, grounded in science and compassion, to address unmet and critical needs in healthcare with the potential to positively impact millions of lives across Asia.

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