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Date: 25th July 2021

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Section 1: Update weekly sessions

Section 2: Please read a message from me – confidential clause for new people joining the sessions (repeated)

A few things about serotonin – and it's role in the body a hormone that helps with mood, feeling of happiness, and helps communication within the body.

I'm having a break!

Section 1:

Update weekly community sessions from Monday 26th July – Sunday 1st August



Monday 26th July – 9am and 8.30pm Wednesday 28th July - 9am Thursday 29th July – 6.30pm Friday 30th July - 9am and 11.30am

Weekend times: Saturday 30th July - 11am Sunday 1st August – There will not be a session.

If you want the Zoom code for any of the session(s) you would like to attend, please contact me through my website's 'contact page'

Section 2:

A message from me regarding confidentiality: I had to remove a new person joining a session recently as they did not confirm the confidentiality clause I ask for, which is one of my standard and quality protocols. I heard from the person later explaining they had a problem with using Zoom as they were new to it. I will now ask for confirmation of confidentiality by email, if a person isn't sure of using Zoom as well as asking at the Zoom session. I will send out an email this week and if you are a person who struggles with Zoom, please email me with the message below:

"I agree I can talk to others about my own experience and what comes up for me in the Mindful Meditation sessions, but I will keep confidential anything which others disclose.'

Study shows how serotonin and a popular anti-depressant affect the gut's microbiota

Date: September 6, 2019 *Source:* University of California - Los Angeles *Summary:*

A new study in mice strongly suggests that serotonin and drugs that target serotonin, such as anti-depressants, can have a major effect on the gut's microbiota -- the 100 trillion or so bacteria and other microbes that live in the human body's intestines.

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gut's microbiota -- the 100 trillion or so bacteria and other microbes that live in the human body's intestines.

Serotonin -- a neurotransmitter, or chemical messenger that sends messages among cells -- serves many functions in the human body, including playing a role in emotions and happiness. An estimated 90% of the body's serotonin is produced in the gut, where it influences gut immunity.

The team -- led by senior author Elaine Hsiao and lead author Thomas Fung, a postdoctoral fellow -- identified a specific gut bacterium that can detect and transport serotonin into bacterial cells. When mice were given the antidepressant fluoxetine, or Prozac, the biologists found this

reduced the transport of serotonin into their cells. This bacterium, about which little is known, is called Turicibacter sanguinis. The study is published this week in the journal *Nature Microbiology*.

"Our previous work showed that particular gut bacteria help the gut produce serotonin. In this study, we were interested in finding out why they might do so," said Hsiao, UCLA assistant professor of integrative biology and physiology, and of

microbiology, immunology and molecular genetics in the UCLA College; and of digestive diseases in the David Geffen School of Medicine at UCLA. Hsiao and her research group reported in the journal Cell in 2015 that in mice, a specific mixture of bacteria, consisting mainly of Turicibacter sanguinis and Clostridia, produces molecules that signal to gut cells to increase production of serotonin. When Hsiao's team raised mice without the bacteria, more than 50% of their gut serotonin was missing. The researchers then added the bacteria mixture of mainly Turicibacter and Clostridia, and their serotonin increased to a normal level.



That study got the team wondering why bacteria signal to our gut cells to make serotonin. Do microbes use serotonin, and if so, for what? In this new study, the researchers added serotonin to the drinking water of some mice and raised others with a mutation (created by altering a specific serotonin transporter gene) that increased the levels of serotonin in their guts. After studying the microbiota of the mice, the researchers discovered that the bacteria Turicibacter and Clostridia increased significantly when there was more serotonin in the gut.

If these bacteria increase in the presence of serotonin, perhaps they have some cellular

machinery to detect serotonin, the researchers speculated. Together with study coauthor Lucy Forrest and her team at the National Institutes of Health's National Institute of Neurological Disorders and Stroke, the researchers found a protein in multiple species of Turicibacter that has some structural similarity to a protein that transports serotonin in mammals. When they grew Turicibacter sanguinis in the lab, they found that the bacterium imports serotonin into the cell.

In another experiment, the researchers added the antidepressant fluoxetine, which normally blocks the mammalian serotonin transporter, to a tube containing Turicibacter sanguinis. They found the bacterium transported significantly less serotonin.

The team found that exposing Turicibacter sanguinis to serotonin or fluoxetine influenced how well the bacterium could thrive in the gastrointestinal tract. In the presence of serotonin, the bacterium grew to high levels in mice, but when exposed

to fluoxetine, the bacterium grew to only low levels in mice.

"Previous studies from our lab and others showed that specific bacteria promote serotonin levels in the gut," Fung said. "Our new study tells us that certain gut bacteria can respond to serotonin and drugs that influence serotonin, like anti-depressants. This is a unique form of communication between bacteria and our own cells through molecules traditionally recognized as neurotransmitters."

The team's research on Turicibacter aligns with a growing number of studies reporting



that anti-depressants can alter the gut microbiota. "For the future," Hsiao said, "we want to learn whether microbial interactions with antidepressants have

consequences for health and disease." Hsiao wrote a blog post for the journal about the new research.

Story Source:

Materials provided by **University of California - Los Angeles**. Original written by Stuart Wolpert. *Note: Content may be edited for style and length.*

Journal Reference:

• Thomas C. Fung, Helen E. Vuong, Cristopher D. G. Luna, Geoffrey N. Pronovost, Antoniya A. Aleksandrova, Noah G. Riley, Anastasia Vavilina, Julianne McGinn, Tomiko Rendon, Lucy R. Forrest, Elaine Y. Hsiao. Intestinal serotonin and fluoxetine exposure modulate bacterial colonization in the gut. *Nature Microbiology*, 2019; DOI: 10.1038/s41564-019-0540-4

And a couple of other interesting things about serotonin:

Although serotonin is well known as a brain neurotransmitter, it is estimated that **90 percent** of the body's serotonin is made in the digestive tract. In fact, altered levels of this peripheral serotonin have been linked to diseases such as irritable bowel syndrome, cardiovascular disease, and osteoporosis.

Serotonin also plays an important role in sleep **because the body uses it to synthesise melatonin**. Melatonin is produced at night and plays a fundamental role in regulating the body's biological clock.



Serotonin helps the body's nervous system to communicate around the body. The medical world thought until recently that each organ worked separately without any knowledge of other organs, however, recent research has shown each organ is in constant communication with all other organs in the body, which is helped by serotonin.

I'm having a break

I will be having a few days off from Thursday 5th August until Sunday 15th August, but I will, depending on local wifi, still be taking the 9am sessions on Monday, Wednesday and Fridays.

Yay!!! Take care everyone. With kindness Pete

