# Turning to the gut to better understand depression

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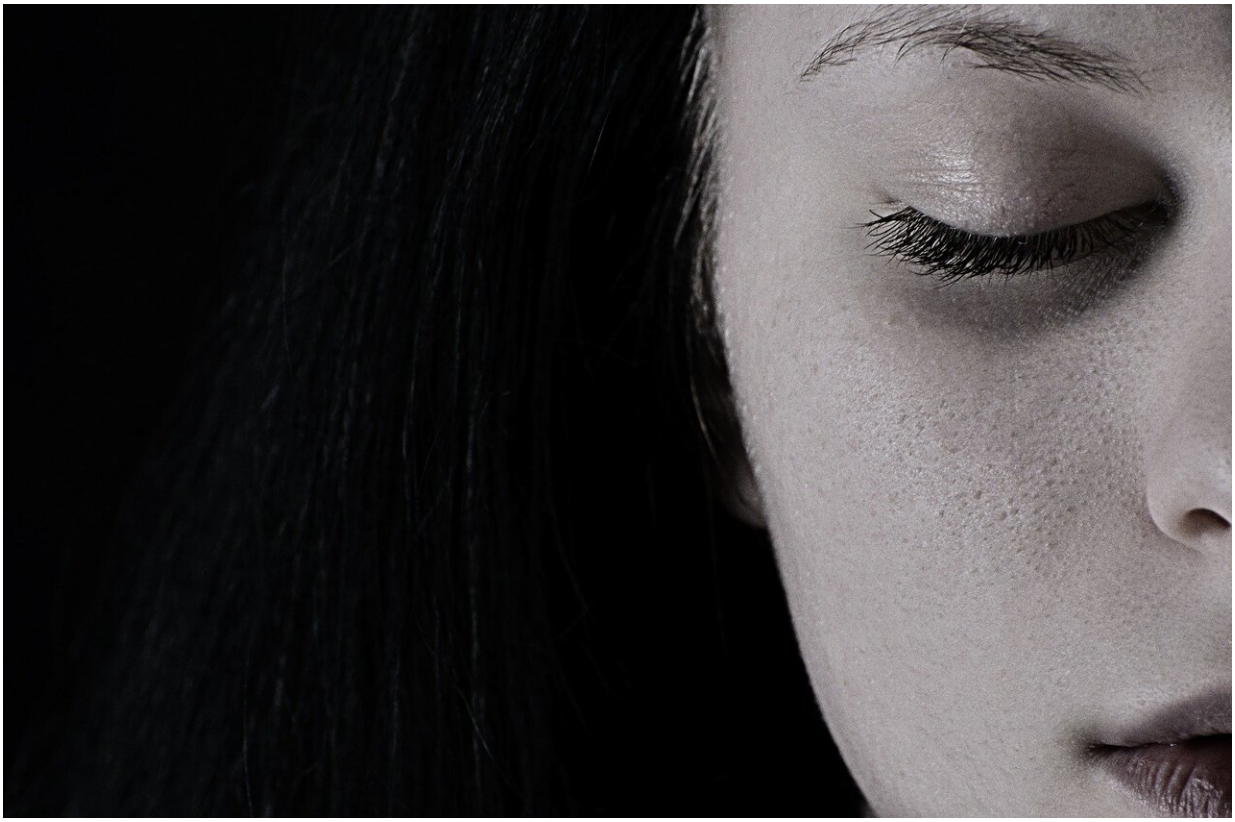

Credit: CC0 Public Domain

Can the community of microbes in our digestive track influence our mental state and, if so, how?

That's a focus of study by Monica Uddin, Ph.D., a professor in USF's College of Public Health, where she contributes to the Genomics Program within the Center for Global Health and Infectious Disease Research. As part of USF's ambitious Initiative on Microbiomes, Uddin wants to better understand how gut microbiota is linked to the symptoms of depression.

"Historically, we've always thought about our organs as working independently from one another, so it's a bit hard to wrap your mind around this,"' said Uddin, whose research just won a $150,000 seed grant from USF. Her USF Health coprincipal investigators are Glenn Currier, MD, professor and chair of psychiatry, and Adetola Louis-Jacques, MD, assistant professor of obstetrics and gynecology.

Major depressive disorder (MDD) is a disabling mental condition worldwide. Treatment resistant depression (TRD) is a particularly severe form in which antidepressant trials have failed. Resistance occurs at a high rate, with more than 35% failing to respond to two different classes of antidepressant.

Recent research, however, is shedding light on the role of microscopic organisms such as bacteria, fungi and viruses on human health, both physical and mental. Such work reveals that a person's intestinal florae is strongly associated with depressive symptoms and MDD. Work from animal models indicates that microbiota is causally linked to depressive behaviors.

Currently, very little is known about the relationship between the microbiome and TRD, and how patients respond to treatment depending on their microbiota. Researchers need to know more about how this florae differs in patients who respond to anti-depression treatment versus those who do not respond despite multiple attempts.

To address this significant health need, Uddin is working with a team that focuses on patients electing a treatment known as transcranial magnetic stimulation (TMS), which has shown some promise in treating TRD. The treatment uses magnetic fields to stimulate brain nerve cells to improve depression symptoms. While it has been effective in treating certain types of depression, it does not provide relief to all patients.

Uddin is studying microbiome-related biomarkers that could one day be used to inform treatment choices and, ultimately, enhance therapy response. Her work is part of a collaboration across professions in which diverse research and solutions can move from the laboratory to the patient bedside.

"The science is at the stage of being more than just descriptive; we're moving toward function,"' she said. "And by understanding the function, the hope is 10 or 20 years down the road we can potentially engineer the gut microbiota of people who get depressed."'

Uddin's seed grant will help her provide the preliminary results needed to pursue full National Institutes of Health or National Science Foundation grant applications.

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