

GUT HEALTH & YOUR MOOD



———— KELSEY ALE, NTP & EMILY BYK ————

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GUT HEALTH & MOOD

You know the old saying, “trust your gut?” Science backs up that there’s physiological truth behind it. Your digestive system may have as much influence on your mood as your brain.

Living in your gut is your *microbiome*. This is a population of roughly 100 trillion microorganisms – about five pounds’ worth.

The metabolic activity of these colonists has a big collective effect on you, their host. They assist with digestion, affect the immune response, and produce many of the vitamins required by our bodies.

Most interestingly, they also produce neurotransmitters - chemical mood regulators - that exactly match our own. Significant amounts of neurotransmitters. For example, half of your dopamine and 90% of your serotonin are produced not by your brain, but by the bacteria in your gut. These neurotransmitters, in turn, greatly affect your mood.

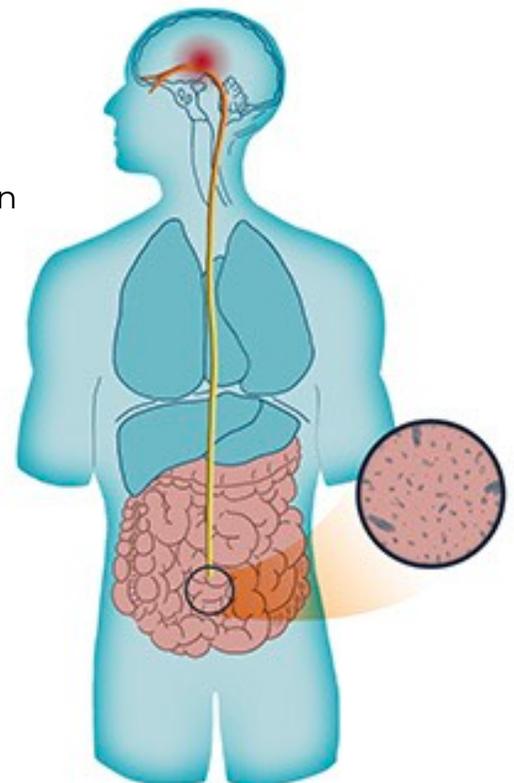
Depression and anxiety are so widespread. Successful treatment is elusive. It is worth investigating this unexpected influence.

PATHWAYS OF GUT-BRAIN COMMUNICATION

There are two main paths of communication between the gut microbiome and the brain.

The Nervous System

The *vagus nerve* is a mighty channel of communication, running from your brain to the end of your tailbone. Along the way, it has side branches that connect to most of the major organs in your body. While it does allow two-way signal transmission, 80% of the vagus nerve’s activity is *afferent*, meaning that it goes from the body to the brain.



This setup connects the metabolic activity of your microbiome directly to the brain. Even though this ever-changing cocktail of neurotransmitters reflects the microorganisms' environment, the brain takes it as legitimate feedback about *your* environment. The literal “feeling in your gut” gets communicated to central command. Your brain interprets and reacts accordingly: it initiates mood changes, fight-or-flight, or other reactions.

Chemical messengers of the inflammatory response

The science of *psychoneuroimmunology* looks at the link between the immune system and the central nervous system.

When the immune system senses a threat, it releases *cytokines*. These are chemical messengers that alert the immune system to activate.

However, they can also affect mood. A simple example: when you have a normal cold, the cytokines can nudge you to feel antisocial. This has the survival benefit of keeping you from spreading the cold to others.

How does the gut microbiome play into this? If it is not in a state of balance, the microorganisms fend for themselves, even at your expense. A stressed microbiome can influence the release of cytokines. This can send your brain a false signal to isolate even when you are not ill. Self-isolation is certainly a common symptom of depression.

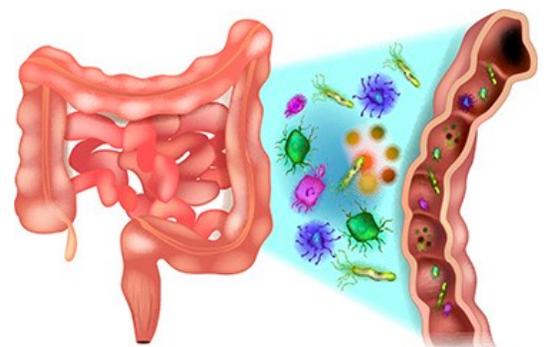
Studies have indeed shown that an increase in cytokine activity can cause symptoms of acute anxiety and depression, cognitive deficits, and increased sensitivity to pain.

MOOD-INFLUENCING MICROBIOME ACTIVITY

Here are some specific examples of how gut activity can influence mood.

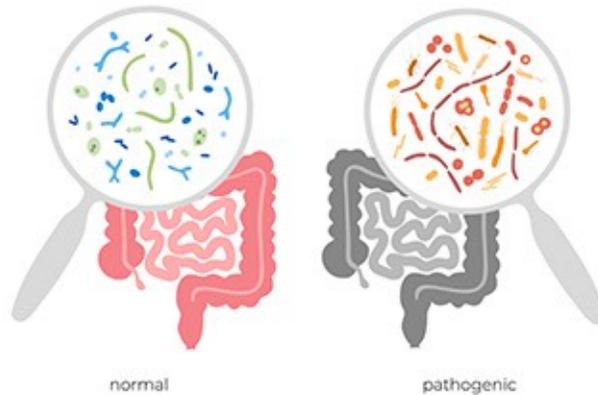
Imbalance of Microbial Species

As mentioned above, our microbiome manufactures multiple neuroactive substances. Ideally, a healthy array of species and strains keep each other in check, and they produce exactly what we need them to. *Dysbiosis*, an imbalance in the microbiome, can have a serious effect on mood.



The absence of certain helpful bacteria is linked to depression. One study assessed volunteers who were diagnosed with depression. Two types of microorganisms, *Coprococcus* and *Dialister*, were absent from their microbiomes, but present in control subjects who reported a high quality of life.

The presence of harmful bacteria can also be to blame. The toxins they produce stress the rest of the microbial population. This alerts the brain to go into distress mode, even though the threat is to the microbiome, not the host.



Reaction to intestinal problems

Our intestines are the microbiome's home. When their environment is threatened, they make moves to correct it. *Leaky gut syndrome* is a state where the intestines become more permeable. This is bad for both the microbiome and the host. The tool available to the microbiome to correct this is our endocannabinoid (EC) system. This system affects sleep, mood, appetite, and memory. Increased intestinal permeability has been linked to depression, anxiety, and even autism.

Infection

One study revealed that people in acute mania had more antibiotic prescriptions than people who were not. The researchers postulated that the use of antibiotics changed the gut microbiome, which affected mood.

EFFECTS OF GUT HEALTH ON DEPRESSION

Based on this information, a fascinating new path has emerged toward tackling the depression pandemic.

Probiotics have been proven to restore normal microbial balance. They have a potential role in prevention - or even treatment - of anxiety and depression.

Studies have shown promising results:

- Participants in one study took either a placebo or a *prebiotic*. (This is a supplement of complex sugars that support a healthy microbiome.) The ones who received the prebiotic showed a lower *awakening cortisone reaction*, which is a biomarker of emotional disturbance. They also reported reduced vigilance and reduced attention to negative emotions.
- Volunteers suffering from chronic stress were given a three-week course of probiotics containing *Bifidobacteria*. They filled out a daily mood-rating scale. All of them reported progressively happier moods.
- In another study, healthy volunteers with no previous symptoms took a 30-day course of probiotics. They all had reduced levels of cortisol, the stress hormone. Their self-reported psychological effects were similar to those typical of people taking diazepam, a common anti-anxiety medication.
- Another study showed probiotics to relieve symptoms of depression as effectively as citalopram and escitalopram, two common antidepressant medications.

ACTIONS YOU CAN TAKE

The benefits of a well-balanced gut microbiome are numerous. Removing their potential interference in your mood is certainly a goal worth pursuing.

A simple first step in ensuring a healthy gut environment is through diet. If you alter what you eat, the composition of your microbiome can begin to change in as little as 24 hours.

Here are some diet choices that encourage a healthy gut environment:

- Eat a wide variety of fruits and vegetables. These provide the prebiotics that support microbial function.
- Eat fermented foods, which are rich in probiotics. Examples are sauerkraut, yogurt or kefir, naturally fermented pickles, and kombucha.
- Avoid refined sugars and oils for a while. This can reduce inflammation.



In addition to food sources, there are many probiotic supplements on the market, most in daily capsule form.

The microbiome can work for your benefit, but now you see that you can't always trust your gut. Take care of your microbiome, and enjoy a more balanced mood.