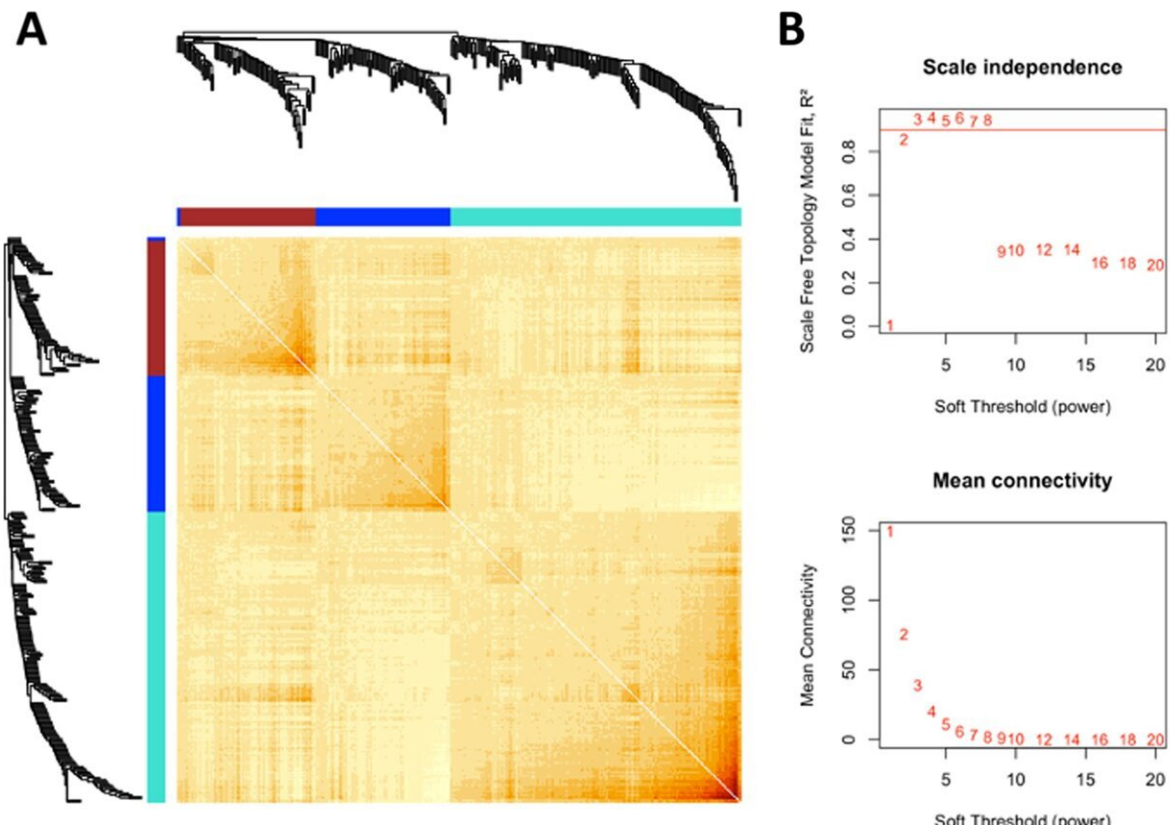


Study looks at ties between anxiety and gut bacteria

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Weighted taxon correlation network analysis reveals a gut microbial network associated with anxiety, depression, and anhedonia clinical test scores after BMI and age correction. Credit: *Translational Psychiatry* (2023). DOI: 10.1038/s41398-023-02416-3

Interactions among microorganisms within the human gut may be

associated with increased anxiety levels in people with depression, according to research led by UT Southwestern Medical Center.

Using advanced bioinformatics tools like 16S rRNA gene sequencing, researchers analyzed stool samples from 178 patients with a current or past diagnosis of [depression](#) who are part of an ongoing Texas Resilience Against Depression (T-RAD) study.

The analysis, published in *Translational Psychiatry*, revealed three networks of gut microbial communities, one of which was correlated with anxiety. While the early findings raise the possibility that gut [bacteria](#) could affect [anxiety levels](#), further validation is needed to confirm whether there is a relationship and how that might translate to a clinical setting.

"This novel approach allowed us to consider the community of bacteria in the gut rather than individual bacteria. One specific microbial community was enriched with butyrate-producing bacteria, and we found that individuals with a low abundance of these key bacteria had higher anxiety," said Jane Foster, Ph.D., Professor of Psychiatry and in the Center for Depression Research and Clinical Care (CDRC) at UT Southwestern.

A UTSW-led team developed the two [longitudinal studies](#) that make up T-RAD, D2K and RAD, in 2020. Spanning 10-plus years and each enrolling 2,500 participants, including from Children's Health and Parkland Health, the studies aim to comprehensively understand depression onset, recurrence, progression, and treatment response. The work is similar to the hallmark Framingham Heart Study that identified risk factors that now serve as gold-standard metrics for heart disease.

Gut microbiota was one of the first biological markers examined by T-RAD because of its role as a key modulator of human physiology and its

strong relationship with mood regulation. Dr. Foster was part of the first research group to connect microbiota to anxiety-like behavior in mice about 15 years ago.

"Understanding the role of specific microbacteria for the anxiety subtype of depression is exciting. This will extend our research into precise treatment targets using further studies with the [gut microbiome](#) to complement our previous findings with brain-based biomarkers," said Madhukar Trivedi, M.D., Professor of Psychiatry, Chief of the Mood Disorders Division, and founding Director of the CDRC. Drs. Trivedi and Foster are also Investigators in the Peter O'Donnell Jr. Brain Institute at UTSW.

Although most studies have focused on single types of bacteria and their association with illness, the current study seeks clinically relevant affiliations when looking at broader bacterial community structures. This suggests that the study's approach may provide a more accurate view of bacterial communities that are linked with specific symptoms in patients.

"In this study, we looked at individuals with a current or previous diagnosis of major depressive disorders. But the importance of the microbiome-brain connections extends to healthy individuals as well as the broader fields of psychiatry and neurology," Dr. Foster said. "The next step will be to validate biomarkers that define individual differences, which could help develop precision approaches to treating depression."

More information: Cherise R. Chin Fatt et al, Leveraging the microbiome to understand clinical heterogeneity in depression: findings from the T-RAD study, *Translational Psychiatry* (2023). [DOI: 10.1038/s41398-023-02416-3](https://doi.org/10.1038/s41398-023-02416-3)

Provided by UT Southwestern Medical Center

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