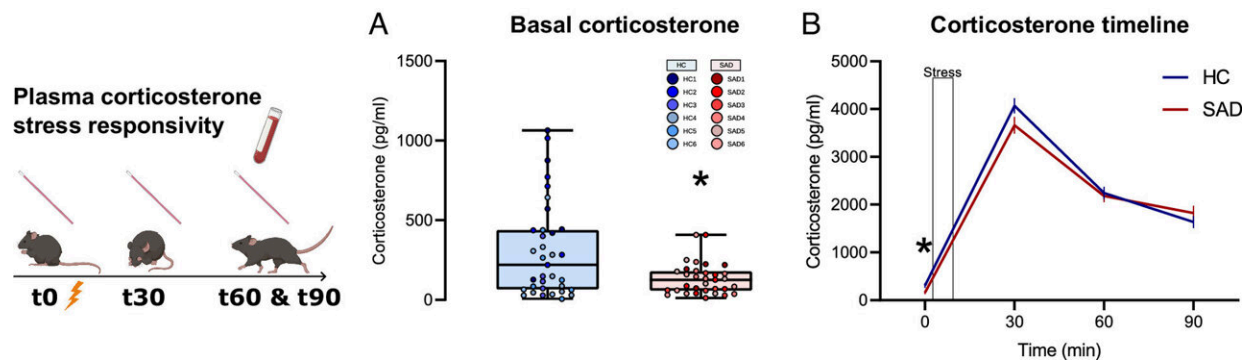


Mouse study shows gut biome plays a role in social anxiety disorder

January 3 2024, by Bob Yirka



SAD FMT modulates basal stress hormone corticosterone plasma levels. (A) Basal plasma corticosterone is significantly reduced in the SAD group compared to HC (B) The stress response timeline measured by plasma corticosterone collected at 30-min intervals over 90 min. There was a significantly lower concentration of plasma corticosterone at the basal timepoint (0 min) in the SAD compared to HC group and no significant effects at the 30-, 60-, or 90-min time points. Credit: *Proceedings of the National Academy of Sciences* (2023). DOI: 10.1073/pnas.2308706120

A large team of medical, psychological and social researchers at University College Cork, in Ireland, working with a colleague from University Hospital Frankfurt, in Germany, has found that certain microbes in the gut biome may play a role in social anxiety disorder. In their study [reported](#) in the *Proceedings of the National Academy of Sciences* the group conducted experiments with fecal transplants in mice

and tested them for anxiety.

Social anxiety disorder (SAD) is a condition in which a person experiences higher than normal levels of anxiety when exposed to people in a [social setting](#), particularly people they don't know. Such settings can include parties, participating in classroom discussions or even standing in line at the grocery store.

Prior research has suggested that conditions in the gut microbiome can have an impact on emotions, which led the team on this new effort to wonder if certain microbes in the [gut microbiome](#) might play a role in SAD. To find out, they designed and carried out an experiment with lab mice.

The researchers gave the mice drugs to kill their [gut microbiomes](#) and then gave some of them [fecal transplants](#) from people with SAD. Others were given fecal transplants from people who did not have the disorder to serve as a control.

After administering the transplants, the researchers exposed the test mice to a variety of social environments, which included interacting with groups of mice they knew and groups that they did not know. They found that the test mice given the SAD fecal transplants displayed symptoms of SAD, while those given the control did not. They also noted that they saw no differences in anxiety between the groups when the mice were interacting with mice they already knew.

The research team also found what they describe as substantial differences in the mix of microbes in the microbiomes of the two groups—most specifically, they found lower numbers of three types of bacteria in the mice who had been given SAD fecal transplants. They also found different levels of brain chemicals (such as oxytocin) in the two groups, and differences that appeared to promote inflammation in

the SAD group.

More information: Nathaniel L. Ritz et al, Social anxiety disorder-associated gut microbiota increases social fear, *Proceedings of the National Academy of Sciences* (2023). [DOI: 10.1073/pnas.2308706120](https://doi.org/10.1073/pnas.2308706120)

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