

Serotonin plays role in many autism cases, studies confirm

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In research studies of autism spectrum disorder, social interaction behaviors of mice were measured by placing them in a three-chamber social interaction test and positioning a "stranger" mouse in one of the chambers. Mice treated with a medication that mimics the effects of serotonin spent more time in the chamber with the stranger mouse than untreated mice and more time sniffing the stranger. Credit: UT Health Science Center San Antonio

Mouse models are yielding important clues about the nature of autism spectrum disorders, which impact an estimated one in 110 children in the U.S. In labs at the UT Health Science Center San Antonio, researchers are studying strains of mice that inherently mimic the repetitive and socially impaired behaviors present in these disorders.

Georgianna Gould, Ph.D., research assistant professor of physiology in the Graduate School of Biomedical Sciences, is eyeing the role that serotonin plays in [autism spectrum disorders](#).

Serotonin is known for giving a sense of well-being and happiness. It is a neurotransmitter, a chemical that acts like a radio tower in the brain conveying signals among cells called neurons. Thirty percent of autism cases may have a serotonin component.

In a recent paper in the *Journal of Neurochemistry*, Dr. Gould and colleagues showed that a medication called buspirone improved the social behaviors of mice. Buspirone is approved by the U.S. [Food and Drug Administration](#) for use in adults as an anti-anxiety and antidepressant adjuvant medication.

Some genetic variations result in diminished transmission of serotonin between neurons. Buspirone increased transmission by partially mimicking the effects of serotonin at cellular sites called receptors.

Reactions to newly encountered mouse

[Social interaction](#) behaviors of the mice were measured by placing them in a three-chamber social interaction test and positioning a "stranger" mouse in one of the chambers. Buspirone-treated mice spent more time in the chamber with the stranger mouse than untreated mice and more time sniffing the stranger.

"No [animal model](#) is completely characteristic of humans, and we're far from saying that buspirone is a treatment for behaviors of autistic people," Dr. Gould said. "But this does offer further proof that serotonin is involved in a significant proportion of autism cases."

Support from the San Antonio Area Foundation made the project

possible. Co-authors of the journal article are Julie Hensler, Ph.D., and Teri Frosto Burke, M.S., of the pharmacology department at the Health Science Center; Lynette Daws, Ph.D., of the university's physiology department in whose lab the work was conducted; and Robert Benno, Ph.D., and Emmanuel Onaivi, Ph.D., of the biology department at William Paterson University in Wayne, N.J.

2nd serotonin-related avenue

Dr. Gould now plans to study the impact of a diet rich in the amino acid, tryptophan, on the social behavior of the mice. Tryptophan is a biochemical precursor of serotonin, which means it is converted into [serotonin](#) during the metabolic process. Foods such as turkey are rich in tryptophan.

"We are going to supplement the diet of mice with tryptophan to see if behavior improves, and also reduce it to see if behavior worsens," Dr. Gould said. The future study of tryptophan is funded by the Morrison Trust, a San Antonio trust that lists nutrition as one of its topics of interest.

Provided by University of Texas Health Science Center at San Antonio

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