

# Study finds promising drug treatment for improving language, social function in people with autism

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Credit: National Library of Medicine

Most drug therapy interventions for people with autism have targeted psychiatric problems, including aggression, anxiety and obsessive behavior. Now, University of Missouri researchers are examining the use of propranolol (a drug used to treat high blood pressure and control heart rate as well as to reduce test anxiety) to improve the primary traits associated with autism – difficulty with normal social skills, language

and repetitive behaviors. MU researchers say the drug is a promising new avenue for improving language and social function.

"We can clearly say that propranolol has the potential to benefit language and may help people with [autism](#) function appropriately in social situations, including making eye contact with others," said David Beversdorf, associate professor and Thompson Endowed Chair at the MU Thompson Center for Autism and Neurodevelopmental Disorders. "Enhancing both language and social function is significant because those are two of the three main features of autism. Clinical trials will assess the drug's effect on all three features, including repetitive behaviors."

Propranolol has been used for decades with minimal side effects reported in healthy individuals. The MU researchers are the first to study the benefits of the drug in autism in a controlled manner. The next step is to conduct clinical trials to determine if the benefits are sustained over time and if the benefits outweigh other effects.

Propranolol acts by reducing the effect of norepinephrine brought on by stress in order to allow the brain to function as if there is no stress. This is beneficial for persons who have trouble with test taking. In people with autism, the brain is hardwired in a different way, making processing more rigid in terms of social function and language. The researchers think that the drug acts on these hardwired processes and therefore, improves tasks and functioning in these areas.

"When healthy persons are under stress their neurons fire in an expedited manner, to respond quickly to the stressor, that does not allow input from remote sources," Beversdorf said. "Unfortunately when trying to solve difficult problems, we need information from remote sources. For example, if we come in contact with a tiger, we are programmed to respond quickly and run away. However, this fight or

flight response isn't as helpful in today's society because instead of facing a tiger, we are taking an exam or giving a speech. Evidence suggests that individuals with autism have a similar difficulty accessing input from remote sources regardless of the presence of stress when using language and communicating."

In previous studies, the researchers found that propranolol helped people with autism solve simple anagrams, word unscrambling tasks. It also increased semantic word fluency, which requires understanding the definition of words and connectivity among different brain regions. It did not help with letter fluency, which involves identifying words that start with specific letters and requires less distributed connectivity among brain regions.

"We are interested to see if we can predict who will or will not respond to this drug among those with autism," Beversdorf said. "In the follow-up study, we're looking at markers of increased stress reactivity. If we find that those with higher stress reactivity are more sensitive to the effects of propranolol, it might help to identify who will benefit most from the drug."

Beversdorf is a physician and faculty member at MU in the departments of Radiology, Neurology and Psychological Sciences. The study, "Effect of [Propranolol](#) on Word Fluency in Autism," was published in *Cognitive and Behavior Neurology*.

Provided by University of Missouri-Columbia

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