

TOOLBOX

Mice sniff out social deficits in their own kind

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To define appropriate social behavior for mice, which are often used as laboratory models of human social disorders, it may be best to ask the mice. This is the basis of a new assay for mouse social deficits, published 21 February in *Autism Research*¹.

Mouse models allow researchers to see whether certain genes are linked to a disorder's symptoms and to test the effects of drugs on these features.

Autism, however, is characterized by social deficits, such as failure to make eye contact and read others' body language, which puts researchers in the difficult position of **looking for equivalent behaviors in mice**. The best-known method for testing social behavior in mice is to put a mouse into a cage with two side chambers, one containing an empty inverted wire cage, and the other holding another mouse in the cage.

Mice are naturally social creatures, and typically spend more time investigating a new companion than the empty cage. Many mouse models of autism do not show this preference, which researchers interpret as a sign of social deficits.

But there are caveats to this method. The mice need to be able to travel between chambers, for example, and their motor deficits, hyperactivity or anxiety may alter this ability. Disinterest in engaging with others is also different from the ability to use appropriate social cues, another deficit linked to autism.

In the new study, researchers instead placed a mouse model with known social deficits into one of the side chambers and a control mouse in the other. They then placed a third mouse, also with typical behavior, in the middle chamber to act as a 'judge,' deciding which of the two other mice it would rather spend time with during a 30-minute session.

The researchers say this approach allows them to assess subtle mouse-specific social cues, without needing to know what those cues are.

The researchers used two types of mice with typical social behavior as judges or on one side of the cage (B6 and 129S6/EvTac). They also assessed three strains of mice that have known social deficits — BALB/c mice, those lacking the autism-linked **GABRB3** gene, and the **BTBR inbred strain**. BTBR mice have several other features reminiscent of autism, including obsessive and **repetitive behaviors**.

Pooling the results for all the strains suggests that B6 mice spend less time with the mice that have social deficits than they do with a typical mouse. This effect is less significant when the 129S6 mice act as the judges.

Even for B6 mice, the difference is significant only during the last ten minutes of the session, suggesting that the 'judge' mouse decides after some initial interactions that it would rather engage with the typical mouse, the researchers say.

The researchers suggest exploring this method further by using a mouse model as the judge, to see whether it is able to sense social deficits in another mouse strain. This may serve as a measure of whether the mouse is able to detect social cues.

REFERENCES:

1. Shah C.R. *et al. Autism Res.* Epub ahead of print (2013) [PubMed](#)