**TOOLBOX**

# Interaction networks suggest new drug treatments

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Similar effects: Drugs approved for different disorders may be linked if they have the same targets, structure or side effects.

Researchers have used protein and drug interaction networks to identify drugs approved for one disorder that may be useful for treating another, they reported 18 January in *Bioinformation*[1].

Using this method, the researchers suggest that four drugs approved to treat high blood pressure — tolazoline, phenoxybenzamine, terazosin and phentolamine — may also be beneficial for autism.

Another study, published in *Translational Psychiatry* in December, suggests that a blood pressure drug, bumetanide, may **improve social deficits** in children with autism[2].

Drugs go through rigorous safety testing as part of their approval. This makes repurposing approved drugs an attractive alternative to developing new candidates.

In the new study, the researchers first created gene-interaction networks using candidate genes linked to each disorder. They found seven genes, including **MTHFR**, that are potential candidates for both autism and high blood pressure.

The researchers then explored whether any of these genes is a direct target of an existing drug. To account for drugs with unknown targets, they developed a 'drug similarity' network that links drugs

based on their structure, side effects and known targets.

A drug for one disorder that has several similarities to a drug for a different disorder is considered to be a candidate treatment for the second disorder.

The researchers used this approach to look for connections between autism, high blood pressure, Crohn's disease and diabetes.

The study suggests that risperidone — one of only two drugs approved to treat autism — may be beneficial for high blood pressure. It also found several connections between drugs for high blood pressure and those for diabetes.

## References:

**1.Fukuoka Y.** *et al.Bioinformation* **9**, 89-93 (2013) **PubMed**

2. Lemonnier E. *et al. Transl. Psychiatry* **2**, e202 (2012) **PubMed**