MedicalXpress

Decreased levels of binding gene affect memory and behavior

December 10 2008

Reducing the activity of a gene called FKBP12 in the brains of mice affected neuron-to-neuron communication (synapse) and increased both fearful memory and obsessive behavior, indicating the gene could provide a target for drugs to treat diseases such as autism spectrum disorder, obsessive-compulsive disease and others, said researchers from Baylor College of Medicine in Houston in a report in the current issue of the journal *Neuron*.

The protein FKBP12 regulates several important cell signaling pathways, and decreasing its activity enhances long-term potentiation in the hippocampus, said Dr. Susan Hamilton, chair of molecular physiology and biophysics at BCM and a senior author of the report. (Long-term potentiation means the enhancement of the synapse or communication between neurons.)

It accomplishes this by fine-tuning a particular pathway called mTOR signaling (mammalian target of rapamycin). The mice in whose brains the activity of the gene was reduced had longer memories and were more likely to exhibit repetitive behaviors than normal mice.

"These studies may offer insight into the molecular underpinnings of repetitive behaviors such as those seen in autism spectrum disorder, obsessive compulsive disorder, schizophrenia and other neurodegenerative disorders," said Hamilton. "Because these studies involved interrupting the mTOR signaling after birth, they challenge the idea that some aspects of these conditions are developmentally

predetermined."

Source: Baylor College of Medicine