Researchers induce memory of safety in brain of rats

Finding suggests possibilities for future treatment of anxiety disorders

Researchers have found a way to pharmacologically induce a memory of safety in the brain of rats, mimicking the effect of training. The finding suggests possibilities for new treatments for individuals suffering from anxiety disorders.

Rats normally freeze when they hear a tone they have been conditioned to associate with an electric shock. The reaction can be extinguished by repeatedly exposing the rats to the tone with no shock. In this work, administering a protein directly into the brain of rats achieved the same effect as extinction training. The protein, brain-derived neurotrophic factor or BDNF, is one of a class of proteins that support the growth and survival of neurons.

Prior work has shown that extinction training does not erase a previously conditioned fear memory, but creates a new memory associating the tone with safety. "The surprising finding here is that the drug substituted for extinction training, suggesting that it induced such a memory," said Dr. Gregory Quirk at the University of Puerto Rico School of Medicine, who led the investigation with support from the National Institute of Mental Health. The work is reported in the June 4 issue of *Science*.

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