Exploring the neuroscience of behavioral therapy in rats

January 15 2018

Credit: CC0 Public Domain

Psychotherapy may improve symptoms of psychiatric disorders by increasing activity in the medial prefrontal cortex, suggests a study of rats exposed to chronic stress. The research, published in *JNeurosci*, is a step toward understanding how the brain processes influenced by behavioral therapy may be targeted to improve treatment.

Cognitive behavioral therapies are commonly used to treat stress-related disorders such as depression and post-traumatic stress disorder, but their

effectiveness varies and it is unclear why they help some patients and not others. David Morilak and colleagues previously developed a rodent model of exposure therapy, which involves confronting the source of stress in a safe environment, to better understand how this kind of treatment changes the brain and behavior.

In this study, adult male rats underwent two weeks of stressful experiences. Animals that received the rodent equivalent of exposure therapy showed improvements in their coping behavior and cognitive flexibility the day after treatment, and the researchers demonstrate that activity in the infralimbic region of the ventral medial prefrontal cortex underlies these improvements. These findings are consistent with clinical studies in which patients with stress-related disorders show reduced activity in the medial prefrontal cortex and increased activity in this region after psychotherapy.

More information: Activity in the ventral medial prefrontal cortex is necessary for the therapeutic effects of extinction in rats, *JNeurosci*, DOI: 10.1523/JNEUROSCI.0635-17.2017

Provided by Society for Neuroscience