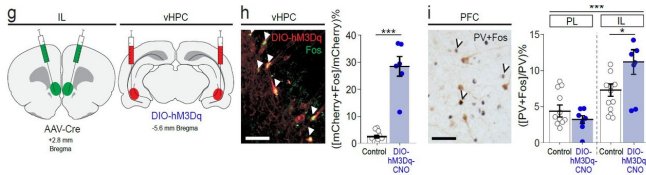


# Brain sciences researcher pinpoints brain circuit that triggers fear relapse

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Pharmacogenetic activation of the ventral hippocampus recruits inhibitory interneurons in the medial prefrontal cortex to cause fear relapse. Credit: Texas A&M University

Steve Maren, the Claude H. Everett Jr. '47 Chair of Liberal Arts professor in the Department of Psychological and Brain Sciences at Texas A&M University, and his Emotion and Memory Systems Laboratory (EMSL) have made a breakthrough discovery in the process of fear relapse.

A paper on their findings, called "Hippocampus-driven feed-forward inhibition of the [prefrontal cortex](#) mediates relapse of extinguished fear," was published in the February issue of *Nature Neuroscience*, a scholarly scientific journal that focuses on original research papers on brain science.

Maren said this discovery could prove helpful for clinicians treating disorders like PTSD.

"Patients often undergo exposure [therapy](#) to reduce their fear of situations and stimuli associated with trauma," Maren said. "Although exposure therapy is often effective, pathological fear and anxiety are known to return or 'relapse' under a number of circumstances. This often occurs, for example, when trauma-related stimuli, which have come to be tolerated during therapy, are unexpectedly experienced outside of the clinical context. Relapse of fear after therapy has been estimated to occur in upwards of two-thirds of

patients undergoing [exposure therapy](#)."

In their research, Maren and his team studied the relationship between three parts of the brain: the hippocampus, which is involved in memory; the prefrontal cortex, which is involved in executive control and regulation; and the amygdala, which is involved in emotion. While the neurocircuit between the three have long been known to process fear, this study has been able to pinpoint connections between the hippocampus and a specific type of cell in the prefrontal cortex that is involved in a relapse of fear.

Travis Goode, a graduate student and member of the research team, said, "This has wide-spread implications for treating [fear](#) disorders in the future, as we now know what part of the brain to target."

Other members of the research team from Texas A&M include Jingji Jin, Thomas F. Giustino, Qian Wang, Gillian M. Acca, and Paul J. Fitzgerald. EMSL also collaborated with the Sah Laboratory in Australia, led by Pankaj Sah.

**More information:** Roger Marek et al, Hippocampus-driven feed-forward inhibition of the prefrontal cortex mediates relapse of extinguished fear, *Nature Neuroscience* (2018). [DOI: 10.1038/s41593-018-0073-9](#)

Provided by Texas A&M University

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