

In Brief: A week to forget your fears?

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Studies with mice have demonstrated that fearful or traumatic memories can be extinguished -- often temporarily, but sometimes permanently.

Now, researchers have identified a molecular basis for these two separate outcomes and they say their findings might eventually be applied to help people permanently overcome their fearful memories as well.

Roger Clem and Richard Huganir experimented with groups of both wild and mutant [mice](#) and found that the role of calcium-permeable glutamate receptors, known as AMPARs, was strengthened during fear conditioning, when the rodents were first learning to be afraid of a stimulus.

They noticed that this up-tick in AMPAR activity lasted for about a week after the initial fear conditioning, but that within this brief window of time, fearful memories could be permanently erased by behavioral experience.

Electrophysiological experiments with thin slices of the rodents' brains confirmed that synaptic changes, acquired during fear conditioning, were actually reversed in mice that had undergone fear extinction training during this week-long window of opportunity.

Taken together, the researchers' findings provide a specific molecular basis for permanent fear erasure and the relative instability of memories during that first week in the brain.

More information: Publication: *Science*, "Calcium-Permeable AMPA Receptor Dynamics Mediate Fear Memory Erasure," by R.L. Clem; R.L. Huganir at Howard Hughes Medical Institute in Baltimore, MD; R.L. Clem; R.L. Huganir at Johns Hopkins University School of Medicine in Baltimore, MD.

Provided by AAAS

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