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New mechanism found for memory storage in brain

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Our experiences –the things we see, hear, or do—can trigger long-term changes in the strength of the connections between nerve cells in our brain, and these persistent changes are how the brain encodes information as memory. As reported in *Neuron* this week, Johns Hopkins researchers have discovered a new biochemical mechanism for memory storage, one that may have a connection with addictive behavior.

Previously, the long-term changes in connection were thought to only involve a fast form of electrical signaling in the brain, electrical blips lasting about one-hundredth of a second. Now, neuroscience professor David Linden, Ph.D., and his colleagues have shown another, much slower form of electrical signaling lasting about a second can also be persistently changed by experience.

They simulated natural brain activity by applying short electrical jolts to slices of rat brain and measuring the current flowing across the cells. After repeated jolting, the strength of the slow nerve signals had dramatically decreased and remained at a low intensity for 30 minutes after electrical jolts ceased.

These slow signals are produced by a nerve cell receptor called mGluR1, which has been associated with behaviors such as addiction and epilepsy. “Both of these conditions also involve long-term changes in the function of nerve connections,” says Linden. “So in addition to furthering our basic understanding of memory storage, our work suggests that drugs

designed to alter mGluR1 are promising candidates for the treatment of addiction, epilepsy, and diseases of memory."

Source: Johns Hopkins Medical Institutions