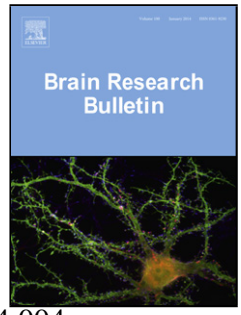

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New mechanistic insights into memory processes

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One of the major goals of neuroscience is to develop a mechanistic understanding of learning and memory processes. Despite decades of intense research, we are still a long way from sufficiently understanding how the brain acquires, stores, retrieves and modifies information and how such processes are affected in diseases. However, the use of novel techniques, including molecular and optogenetic approaches, has significantly advanced the mechanistic understanding of memory processes and their dysfunction in diseases. This *Special Issue* focuses on recently discovered memory mechanisms that function at the molecular, cellular and systems level, which have not yet been covered well in the literature.

Epigenetic regulation is thought to underlie (long-term) memory formation. Shusaku Uchida and Gleb Shumyatsky review not only current knowledge about the role of histone acetylation and DNA methylation in memory formation, they also include a discussion of memory enhancement by CRCTC1-CREB signaling and resulting regulation of Fgf1 transcription (Uchida and Shumayatsky, 2018). At the cellular level, recent findings are emerging that not only excitatory neurons, but also inhibitory interneurons, have an important role for memory formation. Elizabeth Lucas and Roger Clem summarize recent findings that indicate that GABAergic interneurons are critically involved in memory formation (Lucas and