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# Rewiring the connectome: evidence and effects

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HIGHLIGHTS

- Rewiring is a plasticity mechanism that alters connectivity between neurons
- Evidence for rewiring has been difficult to obtain
- New evidence indicates that local circuitry is rewired during learning
- Harnessing rewiring offers new ways to treat psychiatric and neurological diseases

ABSTRACT

Neuronal connections form the physical basis for communication in the brain. Recently, there has been much interest in mapping the "connectome" to understand how brain structure gives rise to brain function, and ultimately, to behaviour. These attempts to map the connectome have largely assumed that connections are stable once formed. Recent studies, however, indicate that connections in mammalian brains may undergo rewiring during learning and experience-dependent plasticity. This suggests that the connectome is more dynamic than previously thought. To what extent can neural circuitry be rewired in the healthy adult brain? The connectome has been subdivided into multiple levels of scale, from synapses and microcircuits through to long-range tracts. Here, we examine the evidence for rewiring at