

Activation of feedforward wiring in adult hippocampal neurons by the basic-helix-loop-helix transcription factor *Ascl4*

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Although evidence indicates that the adult brain retains a considerable capacity for circuit formation, adult wiring has not been broadly considered and remains poorly understood. In this study, we investigate wiring activation in adult neurons. We show that the basic-helix-loop-helix transcription factor *Ascl4* can induce wiring in different types of hippocampal neurons of adult mice. The new axons are mainly feedforward and reconfigure synaptic weights in the circuit. Mice with the *Ascl4*-induced circuits do not display signs of pathology and solve spatial problems equally well as controls. Our results demonstrate reprogrammed connectivity by a single transcriptional factor and provide insights into the regulation of brain wiring in adults.