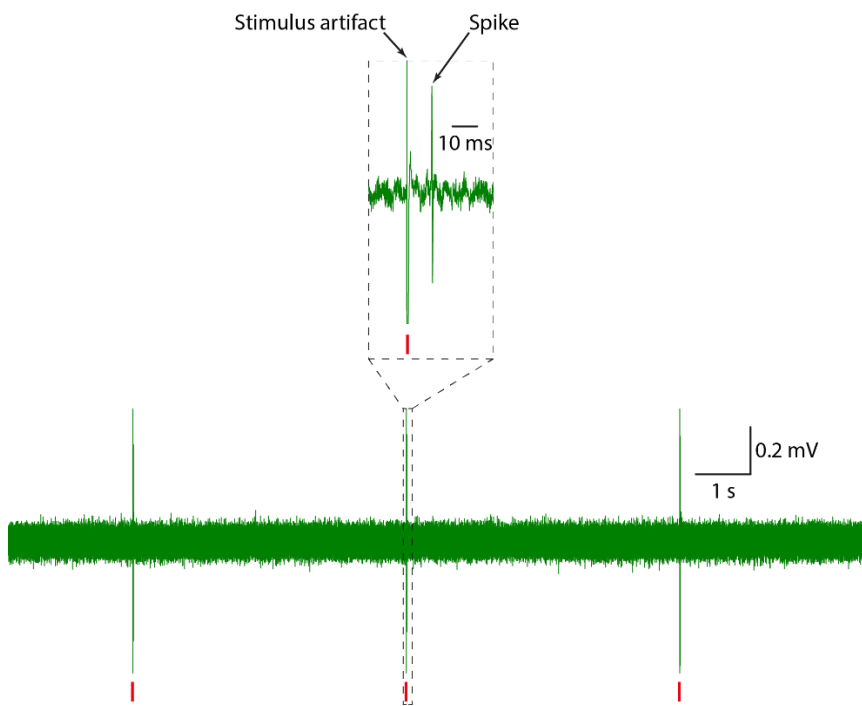


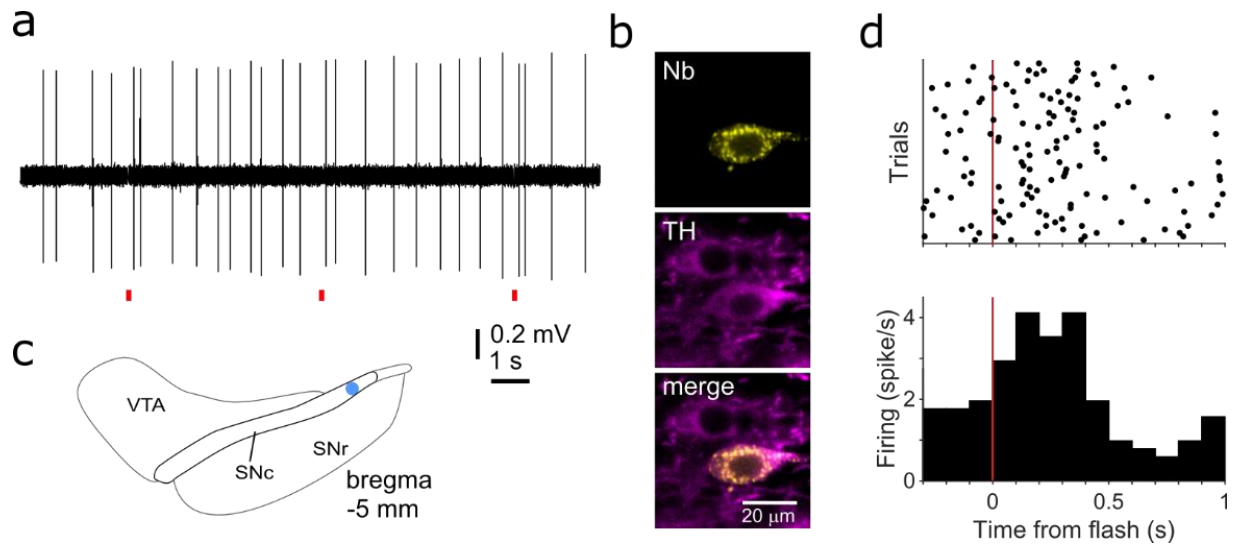
Supplementary information

Coincidence of cholinergic pauses, dopaminergic activation and depolarisation of spiny projection neurons drives synaptic plasticity in the striatum

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Supplementary Fig. 1. Extracellular recording of a SPN. A SPN with no spontaneous spiking activity fired action potentials only following cortical stimulation (red lines).



Supplementary Fig. 2. Phasic spike activity of a dopamine neuron induced by a light flash after bicuculline injection into the SC. **a** Extracellular single-unit *in vivo* recording from an identified midbrain dopamine neuron in the substantia nigra pars compacta (SNc) (**b-c**). Following bicuculline injection into the SC, a light flash to the contralateral eye (red dash in **a**) caused the neuron to increase its firing rate (**a, d**) as described by Dommett et al. (2005). **b** Following recording, the neuron was juxtacellularly labelled with neurobiotin (Nb) to determine its location (a representative example from two neurons) (**c**) and tested for immunoreactivity to tyrosine hydroxylase (TH) to confirm its neurochemical identity.