**Title:** Orbitofrontal Cortex is necessary for the behavioural expression, but not learning, of Pavlovian conditioned inhibition

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**Abstract:**

Orbitofrontal cortex (OFC) lesions cause deficits in flexible behavioural control, most notably response inhibition and has historically been linked to theories of response inhibition. This general inhibition hypothesis of OFC function has since been rejected by evidence that inhibitory behavioural control can be expressed following OFC damage, however the functional role of the OFC in the explicit learning of conditioned inhibition remains untested. Here we test whether muscimol disruption of OFC function during the learning stage of a Pavlovian conditioned inhibition procedure disrupted the learning of conditioned inhibitory associations. Muscimol abolished Inhibitory behavioural control during the learning phase, however learning about the conditioned inhibitor was intact when tested drug free in subsequent summation and retardation tests of conditioned inhibition. Muscimol also significantly impaired acquisition to control cues whose cue-outcome relationship did not change. In a second experiment, conditioned inhibition was found not to play a significant role in cue extinction (non-reinforcement), an effect that was disrupted by intra-OFC infusion of muscimol. These results confirm that the OFC is not functionally necessary for the learning of inhibitory associations but is critical to both the enhancement and suppression of responding when environmental contingencies change.