The neurobiology of tobacco addiction.

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Abstract

The key property that makes nicotine addictive is an ability to support the drug-seeking behaviour that has been demonstrated in self-administration and place preference experiments. This reinforcing effect is complex, possibly involving subjective states of euphoria, cognitive enhancements, changed adaptation to stress, and relief from the nicotine withdrawal syndrome. The neural mechanisms, described here by Ian Stolerman and Mohammed Shoaib, include a primary action on central nicotinic acetylcholine receptors, associated with selective activation of the mesolimbic dopamine system that also mediates other sources of reinforcement. Structures such as the mesopontine tegmentum may also contribute to the reinforcing effect, whereas hippocampal and striatal regions seem to mediate other behavioural changes.