Animal models of alcohol and nicotine addiction.

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One of the major problems in the treatment of drug addiction is the high vulnerability to relapse to drug-seeking behavior even after long periods of abstinence. In laboratory animals it is possible to mimic human relapse behaviour in a so-called 'reinstatement model'. In this model, the ability of re-exposure to the drug, drug-associated stimuli (cues) and stress to reinstate drug seeking is determined following training for drug self-administration and subsequent extinction of the drug-reinforced behaviour.
So far, the majority of reinstatement studies have focussed on opiates and psychostimulants, drugs of abuse with high reinforcing strength. In contrast, studies on the most widespread and frequently abused addictive drugs alcohol and nicotine are still scarce. Therefore, the need is high to understand the specific neuronal mechanisms involved in alcohol and nicotine addiction. Addictive behaviour involving nicotine and alcohol is more difficult to study in laboratory animals as the rewarding value and reinforcing strength of alcohol and nicotine is much lower. Studies so far have shown that the magnitude of reinstatement is less robust than found in studies in which rats were trained to self-administer cocaine or heroin.
Based on paradigms developed by others and on the broad experience of our group with cocaine, heroine and sucrose in relapse models, we are currently setting up reinstatement models with nicotine and alcohol as the reinforcer. Preliminary findings will be presented at the meeting. In the validated model, the neuronal substrates involved in relapse to alcohol- and nicotine-seeking behaviour will be studied at the system, neurochemical and molecular level, as well as possible similarities with the neuronal mechanisms involved in relapse to cocaine and heroin seeking. Final goal is to identify novel targets for a pharmacotherapeutic approach of alcohol and nicotine addiction.

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