

**From volitional drug use to compulsive drug seeking habits:
a progressive hijack of explicit decision making processes.**

Drug addiction is characterised by drug seeking and drug taking habits maintained despite adverse consequences. Loss of control over drug use has for a long time been considered to result from an impairment of prefrontal cortex-dependent executive control over drug-related motivational processes. Such theoretical model of loss of control has led to the development of cognitive-behavioural therapies aiming at restoring control over explicit drug-directed urges, so-called craving. However, not all patients respond to such treatments.

This may be because control is not lost over explicit motivational processes, but instead over sub-cortical, implicit psychobiological processes whereby urges originating from the amygdala aberrantly control dorsolateral striatum-dependent rigid habit system, thereby hijacking any potential control from the prefrontal cortex.

Preclinical models of drug seeking habits have provided unprecedented insights into the neurobiological mechanisms that support the development of aberrant incentive habits that may contribute to the chronicity of compulsive drug use, the hallmark of addiction.

The contribution of preclinical research to the understanding of the neurobiological mechanisms, and associated psychological processes, involved in the progressive development of addiction will be discussed.