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Connections between personality traits and addictive tendencies

Abstract:

There is a link between personality, social stress and tendency to develop addictive behaviors. Socially dominant individuals display resilience to stress, typified by proactive behaviors. In contrast, subordinate individuals are more stress sensitive with a tendency to engage in social avoidance behaviors. Using selectively bred stress-resilient, socially-dominant (Dom) and stress-vulnerable, socially-submissive (Sub) mice we explore the interaction between environmental stressors and inherited predisposition to develop addictive behavior.

We demonstrated that Dom mice have a high level of attraction to cocaine under naïve conditions, while Sub mice display an aversion to this substance of abuse. Oppositely, in a state of chronic mild stress, no increase in attraction to cocaine for Dom mice and a marked increase in cocaine attraction for Sub mice was observed. These observations were complemented by changes in hippocampal dopaminergic neurotransmission and HPA axis activity.

Moreover, Dom and Sub mice exhibited different gut microbiota composition, with increased immune response in Sub animals. The influence of gut-brain axis on social behavior was validated by different modes of fecal microbiota transplantation.

We conclude that social stratification dictates vulnerability to stress and stress-induced drug addiction, while activity of the gut-brain axis may also be contributory to adaptation to stress and as a consequence to differential susceptibility to addiction.