

Genetics of dopamine receptors and drug addiction

Philip Gorwood, Yann Le Strat, Nicolas Ramoz, Caroline Dubertret, Jean-Marie Moalic, Michel Simonneau

Abstract

Dopamine plays a key role in reward behavior, yet the association of drug dependence as a chronic, relapsing disorder with the genes encoding the various dopaminergic receptor subtypes remains difficult to delineate. In the context of subsequent genome-wide association (GWAS) research and post-GWAS investigations, we summarize the novel data that link genes encoding molecules involved in the dopaminergic system (dopamine receptors, transporter and enzymes in charge of its metabolism) to drug addiction. Recent reports indicate that the heritability of drug addiction should be high enough to allow a significant role for a specific set of genes, and the available genetic studies, which might not be already conclusive because of the heterogeneity of designs, methods and recruited samples, should support the idea of a significant role of at least one gene related to dopaminergic system. Evolutionary changes in primates and non-primate animals of genes coding for molecules involved in dopaminergic system highlight why addictive disorders are mainly limited to humans. Restricting the analyses to more specific intermediate phenotypes (or endophenotypes) such as attention allocation, stress reactivity, novelty seeking, behavioral disinhibition and impulsivity, instead of the broad addictive disorder concept can be instrumental to identify novel genes associated with these traits in the context of genome-wide studies.

Human Genetics

June 2012, Volume 131, Issue 6, pp 803–822

[Website](#)