

Dopamine D2 receptor gene (DRD2) TaqIA polymorphism and its association with different phenotypes

Dopamine receptors play an important role in the brain reward system, so they are associated with reinforcing behaviours like alcoholism, drug abuse and drug dependence. These are mental disorders with a heritability about 50%. Candidate gene association studies are used to study heritability. DRD2 is thought to be one of the most relevant candidate gene for **heroin dependence**. Lots of studies showed association between dependence and the TaqIA polymorphism of DRD2 receptor gene. One of the newest study, which was made by *de los Cobos et al.* in 2007, found significant difference in allelic- and genotypic distribution between patients and controls. The problem is that the result of a candidate gene study is difficult to understand and these results are controversial results.

Another disorder – thought to be associated with DRD2 receptor gene – is **schizophrenia**. A study was made by *Behravan et al.* in 2008 in an Iranian population to confirm the studies were made earlier, but this study had limitations, for example small sample size, so it couldn't draw definite conclusions. They found that only the A1 allele frequency was different (higher in females), but this observed difference didn't reach the statistical significance.

In 1990 *Blum et al.* reported an association of the TaqIA DRD2 with **alcoholism**. Numerous studies have found linkage between the increased frequency of A1 allele and the disease, but several other studies have found no evidence. There was an article in 2006 by *Berggren et al.* which had the statistical power to detect the small effect of A1 allele in its potential relationship with alcohol-dependence, because the sample size was large enough. There was no difference in the genotype frequencies between patients and controls, but the A1 allele frequency was overrepresented in the alcohol-dependent group.

In 2007 *Epstein et al.* studied the association between **food reinforcement**, energy intake and DRD2 genotypes. Food reinforcement was greater in obese individuals, especially with A1 allele. Energy intake was associated with food reinforcement. The higher food reinforcement they had, the greater energy intake they showed.

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- [2] Epstein, L.H. – Saelens, B. E. et al. (1996): Reinforcing Value of Food in Obese and Non-obese Women. *Appetite* **27**, 41-50
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- [4] Berggren, U. – Fahlke, C. (2006): The TaqI DRD2 A1 allele is associated with alcohol dependence although its effect size is small. *Alcohol & Alcoholism* **41**, 479-485