Dynamics of human executive functions and their relation to genotypes in the dopaminergic system

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The dynamic adaptation of behavior to ever changing environmental requirements is a core function of the human executive system and underlies considerable interindividual variation. The dopaminergic system is important for the regulation of executive processes and its activity is in part determined by certain genetic polymorphisms. Thus, the question arises to which degree individual differences in the dynamics of executive control are genetically determined. A large group of subjects will be screened for polymorphisms of four dopaminergic genes. Smaller subgroups will be formed on the basis of the presence of specific alleles. These will take part in brain potential experiments assessing self-monitoring, storage and manipulation of information in working memory, allocation of attention and inhibition aspects of executive function. The electrophysiological and behavioural markers will be compared between the subgroups. Moreover, high-resolution 3D structural MRI will be performed allowing anatomical comparison between subgroups using the voxel-based- morphometry approach.

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