Identification of Genes from Protein-Protein Network Analyses in Obsessive-Compulsive Disorder

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Obsessive-compulsive disorder (OCD) is a severe psychiatric disorder, which can become incapacitating. Although family and twin studies suggest a complex genetic etiology, specific risk variants have not been confirmed, and the cellular and molecular mechanisms underlying OCD pathophysiology remain uncertain. The aim of this study was to identify biological pathways associated with OCD using candidate genes previously identified in family candidate genes studies, genetic OCD meta-analysis and GWAS studies. In addition, a protein-protein interaction (PPI) network was performed based on interactome database of physical direct pair-wise molecular interactions, to explore the functional molecular correlation between those genes using the Ingenuity software. To my knowledge, this was the first study designed to search biological pathways and new candidate genes using PPI approach in OCD. Pathway analyses suggested an enrichment of genes involved in Serotonin receptor signaling, G protein coupled receptor signaling and cAMP mediated signaling. G protein receptor signaling and cAMP-mediated signaling have been already related with other neuropsychiatry disorders although this was the first time these pathways were associated with OCD. The genes: ADCY8, CHRM5 and NOS1 were candidate genes for OCD that appeared with great importance in this analyses. Beside that, in the PPI analysis the genes SP1, SRC, IRF3 were genes with many interactions with other genes that did not have connections between each other and were considered as new candidate genes associated with OCD. This study points to the involvement of glutamate and transcription factor genes associated with OCD.

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