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Genes involved in neurodevelopment, neuroplasticity and bipolar disorder: *CACNA1C, CHRNA1* and *MAPK1*

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Bipolar disorder (BPD) is a common and severe mental disorder. The involvement of genetic factors in the pathophysiology of BPD is well known. In the present study we tested the association of several SNPs within three strong candidate genes, CACNA1C, CHRNA7 and MAPK1, with BPD. These genes are involved in monoamines-related pathways as well as in dendrites development, neuronal survival, synaptic plasticity and memory/learning. 132 subjects diagnosed with BPD and 326 healthy controls of Korean ancestry were genotyped for 40 SNPs within *CACNA1C, CHRNA17* and *MAPK1*. Distribution of alleles and block of haplotypes within each gene were compared in cases and controls. Interactions between variants in different loci were also tested. Significant differences in the distribution of alleles between the cases and controls where detected for *rs1016388 within CACNA1C, rs1514250, rs2337980, rs6494223, rs3826029* and *rs4779565* within *CHRNA7* and *rs8136867 within MAPK1*. Haplotype analyses also confirmed an involvement of variations within these genes in BPD. Finally, exploratory epistatic analysis demonstrated potential interactive effects, especially regarding variations in CACNA1C and CHRNA7. Overall, our data suggest a possible role of these three genes in BPD. Alterations of one or more common brain pathways (e.g. neurodevelopment, neuroplasticity and calcium signaling) may explain the obtained results. However, a limited sample size and the consequent risk of false positive findings should be carefully taken into consideration when evaluating these results.

Biography

Chi-Un Pae has completed his PhD from Catholic University of Korea (CUMC), South Korea. He is the Principal Investigator of Depression Research Center, funded by Korean Government. He has published more than 334 papers in reputed journals and has been serving as an Editorial Board Member of repute.

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