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# Individual differences in multichannel ERPs related to polymorphisms in COMT and BDNF genes

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## Abstract

We aimed at studying variability in the electrical brain activity elicited by the warning stimulus in visual categorization tasks and its possible correlations with the BDNF (Val66Met) and COMT (Val158Met) polymorphisms. In the first task, the instruction was to press different buttons for human and animal faces. Half of the images in either group were neutral and half were showing aggressive people or animals. In the second task, the instruction was to press different buttons for human faces (attractive or non-attractive female face) and for non-face objects (butterfly or flower). In both tasks each picture was preceded by the CUE - simple pattern, unique for each category of pictures, which meaning was not explained to the participants. 128-channel EEG was recorded in 93 volunteers. Response elicited by the CUE and the following slow wave (CNV) were analyzed. From the group of Val/Val carriers of BDNF gene, and, separately, from Val/Met carriers of BDNF gene, we selected Val/Val and Met/Met carriers of COMT gene; this gave as 4 genotypes. Category-related ERP differences were observed, implying the association of the CUE and picture category. However, the differences were clear and robust only in the group "Met/Met for COMT and Val/Val for BDNF". This group had the largest P220 and N600 components in the posterior regions, compared to other groups. However, the group "Val/Val for COMT and Val/Met for BDNF" also had large P220 and P430 components. This effect of gene combination may explain controversial reports on one-gene-one-component correlations (e.g. P300 and COMT).

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