

Genetic markers and neurophysiological correlates of the psychological personality traits among people from different regions of Siberia

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Motivation and Aim: Psychological genetics investigates the associations between molecular-genetic markers and the human psychological personality traits, including inclinations to mental pathology. Neurophysiological indicators such as EEG measures show associations with both genetic and behavioral indices. The climate environment is also a factor affecting both brain activity and human behavior. Our project investigated associations between genetic markers and neurophysiological correlates of psychological personality traits in people living in different regions of Siberia – Novosibirsk Region, Altai Territory, Republic of Tuva and Republic of Sakha (Yakutia).

Participants and Methods: Our study includes two stages. In the first stage, bioinformatic analysis of the scientific papers was performed (Ivanov et al., 2019). The 164 allelic polymorphisms of brain neurotransmitter systems were identified, for each of which its associations with the risk of anxiety-depressive disorders depend on the region of residence and ethnic characteristics of people. At the second stage, we collected and analyzed a collection of data obtained from a sample of 1744 people living in different regions of Siberia. The participants were of eight ethnic groups and differed by region of residence, social status, sex, and age. For all participants, the samples of biological materials were collected, genome sequencing was carried out, and the individual single nucleotide polymorphisms for all previously selected 164 pairs of alleles were defined. All participants completed the set of questionnaires to estimate psychological personality features and a tendency to anxiety-depressive disorder. The most of these people participated in EEG experiments with resting-state conditions and under recognition of emotional-related stimuli.

Results: Different alleles of these genes are associated with psychological individual traits in the scores of collectivism-individualism, extroversion, consciousness, trait anxiety and neuroticism. Regional differences in the frequency of distribution of alleles associated with socially significant personality traits in various regions of Siberia have been identified. Associations between allelic polymorphism of selected genes and delta and alpha rhythm scores under resting conditions and emotional speech recognition have been investigated.

Conclusion: The results make it possible to propose a model of the complex influence of genetic and regional factors on the formation of personal psychological characteristics of people.

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References

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