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## The effect of *AVPR1A*, *GATA2*, and *PCDH7* gene variants on developing music abilities in Russian students

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### ABSTRACT:

According to neurobiological hypothesis, the development of music abilities is a complex process affected by multiple genes, epigenetic and environmental components. Twin research demonstrated that the coefficient of inheritance of music pitch and rhythm accounted for 70-80%. It was suggested that molecular pathways regulating prosocial behavior and music perception might be responsible for individual differences in music abilities. Namely, association studies linked genetic variants in the arginine vasopressin receptor gene (*AVPR1A*), GATA transcription factor (*GATA2*) and protocadherin 7 (*PCDH7*) to music perception and memory. The present study aimed to estimate the main effect of *AVPR1A* RS1, *GATA2* rs9854612 and *PCDH7* rs13146789 gene variants in developing music abilities in Russian students. The study included musically talented students, who passed through the severe contest to study in musical conservatories (N=100, 63% women; aged 18-22 years) in Moscow (Russia). Control group consisted of mentally healthy individuals (N=100) corresponding by age, sex, and ethnicity to the group of musically talented individuals. SNPs genotyping was performed using PCR-based KASP genotyping technology on "CFX96" DNA Analyzer. Statistical testing of logistic regression models was performed with PLINK v.1.09. We succeeded to observe an increased frequency of *PCDH7* rs13146789 T-allele ( $\chi^2=4.51$ ,  $P=0.033$ , OR=1.60, 95%CI 1.03-2.47) and TT-genotype ( $\chi^2=4.28$ ,  $P=0.039$ , OR=2.8, 95%CI 1.31-6.96) in musically talented students. However, other examined gene variants failed to be associated with music aptitude. The impact of *PCDH7* variants in musical abilities are congruent to previously reported protocadherins involvement in amygdale development – brain region related to emotion recognition for music.

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