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The association between romantic relationship status and 5-HT1A gene in young adults

SUBJECT AREAS:
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What factors determine whether or not a young adult will fall in love? Sociological surveys and psychological studies have shown that non-genetic factors, such as socioeconomic status, external appearance, and personality attributes, are crucial components in romantic relationship formation. Here we demonstrate that genetic variants also contribute to romantic relationship formation. As love-related behaviors are associated with serotonin levels in the brain, this study investigated to what extent a polymorphism (C-1019G, rs6295) of 5-HT1A gene is related to relationship status in 579 Chinese Han people. We found that 50.4% of individuals with the CC genotype and 39.0% with CG/GG genotype were in romantic relationship. Logistic regression analysis indicated that the C-1019G polymorphism was significantly associated with the odds of being single both before and after controlling for socioeconomic status, external appearance, religious beliefs, parenting style, and depressive symptoms. These findings provide, for the first time, direct evidence for the genetic contribution to romantic relationship formation.

Love is a complex phenomenon that involves both psychological and biological processes. It is a state of mind characterized by intense feelings, thoughts, and actions that are directed towards another person. The biological basis of love is still largely unknown, but recent research has shown that it is associated with changes in brain chemistry, particularly in the levels of serotonin, a neurotransmitter that is involved in mood regulation and social behavior. The 5-HT1A receptor is a key component of the serotonin system, and its function is regulated by a polymorphism in the 5-HT1A gene (C-1019G, rs6295). This polymorphism has been shown to be associated with various psychological traits, including anxiety, depression, and social behavior. In this study, we investigated whether the C-1019G polymorphism is associated with romantic relationship status in young adults.

We found that individuals with the CC genotype (50.4%) were more likely to be in a romantic relationship compared to those with the CG (39.0%) or GG (10.6%) genotypes. This association remained significant after controlling for socioeconomic status, external appearance, religious beliefs, parenting style, and depressive symptoms. These findings provide direct evidence for the genetic contribution to romantic relationship formation. The C-1019G polymorphism may influence romantic relationship formation by affecting serotonin levels in the brain, which in turn affects social behavior and mood regulation.

Results

The association between the C-1019G polymorphism and romantic relationship status was analyzed using logistic regression. The results showed that individuals with the CC genotype had a significantly higher odds of being in a romantic relationship compared to those with the CG or GG genotypes. The odds ratio for the CC genotype was 1.5 (95% CI = 1.1–2.0, $p = 0.008$). This association remained significant after controlling for socioeconomic status, external appearance, religious beliefs, parenting style, and depressive symptoms. The odds ratio for the CC genotype was 1.4 (95% CI = 1.0–1.9, $p = 0.021$). The association between the C-1019G polymorphism and romantic relationship status was also analyzed using chi-square tests. The results showed a significant association between the C-1019G polymorphism and romantic relationship status ($\chi^2 = 10.2$, $p = 0.002$).

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Table 1 | The effect of C-1019G (rs6295) polymorphism on the distribution of romantic relationship status

	Genotype frequency			Total
	CC	CG	GG	
In a relationship	182 (50.4%)	72 (38.9%)	13 (39.4%)	267 (46.1%)
Single	179 (49.6%)	113 (61.1%)	20 (60.6%)	312 (53.9%)

Note. N = number of individuals being in a relationship (single). The percentages were computed by dividing the number of individuals in a relationship (single) with the number of individuals having a particular genotype.

Supplementary Materials

$\chi^2 =$
 $df =$ $p =$
 $SE =$ $df =$ $\chi^2 =$ $p =$ $B =$
 $R =$ %

$ps >$

Supplementary Materials

$t =$ $p <$

Discussion

Individuals with the CG/GG genotype were more likely to be single than individuals with the CC genotype.

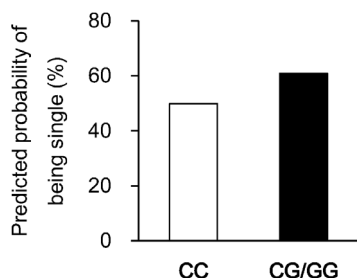


Figure 1 | Impact of the 5-HT1A C-1019G polymorphism on the predicted probability of being single after controlling for socioeconomic status, external appearance, religious belief, parenting style, and depression. Individuals with the CG/GG genotype were more likely to be single than individuals with the CC genotype.

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5-HT1A

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Additional information

Supplementary information [Supplementary information](#) is available for this article.

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