Science of romantic relationships includes gene factor

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(Medical Xpress)—Adolescents worry about passing tests, winning games, lost phones, fractured bones—and whether or not they will ever really fall in love. Three Chinese researchers have focused on that last question. They pose the questions: Why do some students stay single? What factors determine if a young adult falls in love? They have written the paper, "The association between romantic relationship status and 5-HT1A gene in young adults." in *Scientific Reports*.

Beyond those familiar factors—hair style, beauty, clothes, smooth talking and engaging personality—they set out to show that genetic variants may contribute to the start or non-start of a romantic relationship. "Love-related behaviors, such as pair bonding and affective affiliation, are shown to be associated with the serotonin levels in the brain," they said. "In non-human animals, decreasing serotonin levels via 5-HT1A receptor agonists diminishes female sexual receptivity and induces aggression towards male mates. The G allele of the C-1019G (rs6295) polymorphism, which leads to higher expression of 5-HT1A gene, is related to decreased comfort with close relationship." Is it possible that the 5-HT1A gene polymorphism is related to the likelihood of a young adult being in a relationship? To explore answers they tested 579 Chinese undergraduate students. Hair follicle cells were collected for genotyping. They said that genomic DNA was extracted from hair follicle cells by using the Chelex-100 method. -C1019G in 5-HT1A was amplified by polymerase chain reaction.

The results: Individuals carrying the G allele (CG/GG) of C-1019G polymorphism were more likely to be single than CC carriers.

"This is consistent with the finding that G allele carriers are less comfortable in close relationships with others. Indeed, G allele carriers are more likely to develop neurotic personalities and psychiatric disorders such as major depression and borderline personality disorder. As pessimism and neuroticism are detrimental to the formation, quality, and stability of relationships, this connection between G allele and psychological disorders might decrease carriers' dating opportunities or lead to romantic relationship failure."

Ian Sample, science editor at The Guardian, further explained their results: "Tests on 579 Han Chinese students revealed that half of those who inherited two copies of the C variant – one from each parent – were in relationships. But students who carried one or two copies of the G

variant had only a 40 percent chance of being in a relationship. The effect was small, but statistically significant."

They wrote that "Our results demonstrate the importance of 5-HT1A C-1019G in individual differences on romantic relationship formation, thereby providing evidence for the genetic contribution to complex social relationships in certain contexts."

The authors are from Henan University of Science and Technology and Peking University.

More information: The association between romantic relationship status and 5-HT1A gene in young adults, *Scientific Reports* 4, Article number: 7049 DOI: 10.1038/srep07049

Abstract
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.