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## MC4R POLYMORPHISM IS ASSOCIATED WITH APPETITE AND BEVERAGE INTAKE IN OVERWEIGHT AND OBESE CHILDREN: A FAMILY-BASED ASSOCIATION STUDY IN CHINESE POPULATION

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**Background:** Recent studies indicated that eating behaviors are under genetic influence, and the melanocortin 4 receptor (MC4R) gene polymorphisms can affect the total energy intake and the consumption of fat, protein and carbohydrates. Our study aims at investigating the association of the MC4R polymorphism with appetite and food intake among Chinese children.

**Methods:** A family-based association study was conducted among 151 Chinese trios whose offspring's were overweight/obese children aged 9-15 years. The MC4R rs12970134 polymorphism was genotyped, the Children Eating Behavior Questionnaire (CEBQ) and a self-designed questionnaire measuring food intake were performed. The FBAT and PBAT software packages were used.

**Results:** The family-based association analysis showed that there was a significant association between rs12970134 and obesity ( $Z=2.449$ ,  $P=0.014$ ). After adjusting for age, gender and standardized BMI, the MC4R rs12970134 polymorphism was significantly associated with food responsiveness (FR) among children ( $\beta'=0.077$ ,  $P=0.028$ ), and with satiety responsiveness (SR) in trios ( $P=-0.026$ ). The polymorphism was associated with beverage intake ( $\beta'=0.331$ ,  $P<0.001$  in children;  $P=0.043$  in trios), but not significantly associated with vegetable, fruit or meat intake ( $P>0.050$ ). We further found a significant mediation effect among the MC4R polymorphism, FR and beverage intake ( $b=0.177$ ,  $P=0.047$ ).

**Conclusions:** Our study is the first to report that the MC4R rs12970134 polymorphism was associated with appetite and beverage intake, and food responsiveness could mediate the effect of rs12970134 on beverage intake in Chinese children population. Further studies are needed to uncover the genetic basis for eating behaviors, which could lead to develop and implement effective interventional strategies early in life.

### Biography

Shuo Wang is majored in public health and pursuing her Ph.D. degree at Institute of Child and Adolescent Health at Peking University since 2013. She studies at University of Notre Dame as a joint Ph.D. student from Oct 2015 to Sep 2016. Her research focuses on the genetic risk factors of obesity in children and adolescents, including single nucleotide polymorphisms, gene-behavior interaction and DNA methylation. She has published more than 10 papers in reputed journals including PLoS One, Chinese Journal of Child Health Care and Chinese Journal of Epidemiology.

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