

## Association of *TIRAP* (*MAL*) gene polymorphisms with susceptibility to tuberculosis in a Chinese population

Y.X. Zhang<sup>1</sup>, Y. Xue<sup>1,5</sup>, J.Y. Liu<sup>1,6</sup>, M.Y. Zhao<sup>1</sup>, F.J. Li<sup>2</sup>, J.M. Zhou<sup>3</sup>,  
H.J. Wang<sup>4</sup> and J.C. Li<sup>1</sup>

<sup>1</sup>Institute of Cell Biology, Zhejiang University, Zhejiang, China

<sup>2</sup>Hangzhou Red Cross Hospital, Hangzhou, China

<sup>3</sup>Jilin Academy of Traditional Chinese Medicine Sciences, Changchun, China

<sup>4</sup>The Sixth Hospital of Shaoxing, Shaoxing, China

<sup>5</sup>Henan University of Science and Technology, Luoyang, China

<sup>6</sup>Department of Cell Biology, Hangzhou Normal University, Hangzhou, China

Corresponding author: J.C. Li

E-mail: lijichen@zju.edu.cn

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**ABSTRACT.** Toll-interleukin 1 receptor (TIR) domain containing adaptor protein (TIRAP; also known as MAL) is an essential adaptor molecule in Toll-like receptor signaling, involved in activating the innate immune response during infection. Genetic variations in the *TIRAP* gene may influence human susceptibility to infectious disease. To date, in the Chinese population, a possible predisposition of *TIRAP* gene variants to tuberculosis has not been reported. We investigated whether *TIRAP* gene polymorphisms are associated with the development of tuberculosis in a Chinese population. We investigated all the single-nucleotide polymorphisms (SNPs) within the *TIRAP* exon 5 in a case-control study of 212 patients with tuberculosis and 215 controls in a Chinese population. Genotyping was performed to identify the polymorphisms of *TIRAP* gene by PCR-DNA sequencing method. Haplotypes for the *TIRAP* gene variants were constructed using Haplo-

view version 4.2. Six polymorphisms of the SNPs listed in the National Center for Biotechnology Information database were detected in these Chinese tuberculosis patients. It was found that both the frequency of the 286A allele (odds ratio (OR) = 13.37; 95% confidence interval (CI) = 0.75-238.3;  $P < 0.01$ ) and the frequency of 286AG genotype (OR = 13.57; 95%CI = 0.76-242.5;  $P < 0.01$ ) were significantly higher in patients than in healthy controls. However, two other SNPs, C539T and C558T, reported to be associated with tuberculosis in other populations, were found not to be associated with tuberculosis in this Chinese population. We conclude that *TIRAP* G286A (D96N) polymorphism is associated with susceptibility to tuberculosis and may be a new risk factor for the development of tuberculosis in China.

**Key words:** Innate immunity; Single-nucleotide polymorphisms; Toll-interleukin 1 receptor domain containing adaptor protein; Disease susceptibility; Tuberculosis