

## Role of Genetic Polymorphisms in Type 2 Diabetes Mellitus

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### EDITORIAL NOTE

Type 2 Diabetes Mellitus (T2DM) is a serious metabolic disorder with chronic hyperglycemia characterized by impaired insulin secretion and resistance. Globally, the International Diabetes Federation displayed more than 451 million people with diabetes in 2017. With the aging population and the westernization of lifestyle, the prevalence of diabetes in China has been rising rapidly from 0.67% in 1980 up to 10.4% in 2013. In china, approximately 11% of the population has diabetes, with a significant proportion remaining undiagnosed. The pathogenesis of T2D is complicated and multifactorial, which is driven by environmental, lifestyle and genetic factors. Age, sex, cigarette smoking, alcohol drinking and overweight have been reported to be risk factors for T2DM. In addition, genetic factors contribute strongly to the etiology and manifestation of T2DM. To date, many risk loci have been recognized to affect T2DM susceptibility, but numerous loci remain to be detected.

Suppressor of Cytokine Signaling 2 (*SOCS2*) proteins is a member of the suppressor of cytokine signaling family, which is a negative regulator of cytokine and growth factor signaling. *SOCS2* protein was reported to interact with the insulin-like growth factor-1 receptor and decrease its biological actions. *SOCS2* was down regulation in diabetes, which might be related to either insulin deficiency or resistance. *SOCS2* was involved in hyperglycaemia and glucose intolerance caused by the abnormal regulation of proinsulin processing and insulin secretion in beta cells. The overexpression of *SOCS2* possesses the protective function in the development of diabetic nephropathy by reducing the expression of inflammatory cytokines and suppressing the activation of JAK/STAT pathway. These

physiological studies proposed that *SOCS2* might play an important role in diabetes, but the role of genetic polymorphism within *SOCS2* gene for T2DM predisposition has been less studied. Therefore, we chose *SOCS2* gene as a candidate gene to explore the effect of single-nucleotide polymorphisms in *SOCS2* on the development of T2DM.

Here, five SNPs (rs10859525, rs3825199, rs11107116, rs10492321, and rs10859563) in *SOCS2* were genotyped to examine the contribution of genetic variants in *SOCS2* to the risk of T2DM occurrence at single-locus and combined SNPs interface. Our study also investigated whether the relationship of *SOCS2* polymorphisms with T2DM risk persists across age, gender, lifestyle and BMI. Further, the contribution of *SOCS2* polymorphisms to the susceptibility diabetic complications was explored in the Chinese Han population.

The study group consisted of 500 T2DM patients and 501 healthy volunteers from the affiliated Hospital. All enrolled subjects were unrelated Chinese Han ethnicity. Patients with type 1 diabetes, gestational diabetes, malignancy, acute infections, inflammation, other chronic diseases or other endocrine disease, and not receiving any drugs like anti diabetics were excluded. The controls were age and sex matched no history of diabetes and other chronic diseases. Information on demographics, life style factors and clinical characteristics of the participants was obtained from standardized questionnaires and medical record, including age, sex, body mass index (BMI), smoking, drinking, fasting blood glucose, total cholesterol, triglyceride, low-density lipoprotein cholesterol and high-density lipoprotein cholesterol, urea, creatinine, serum uric acid, glycated hemoglobin, and insulin.

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