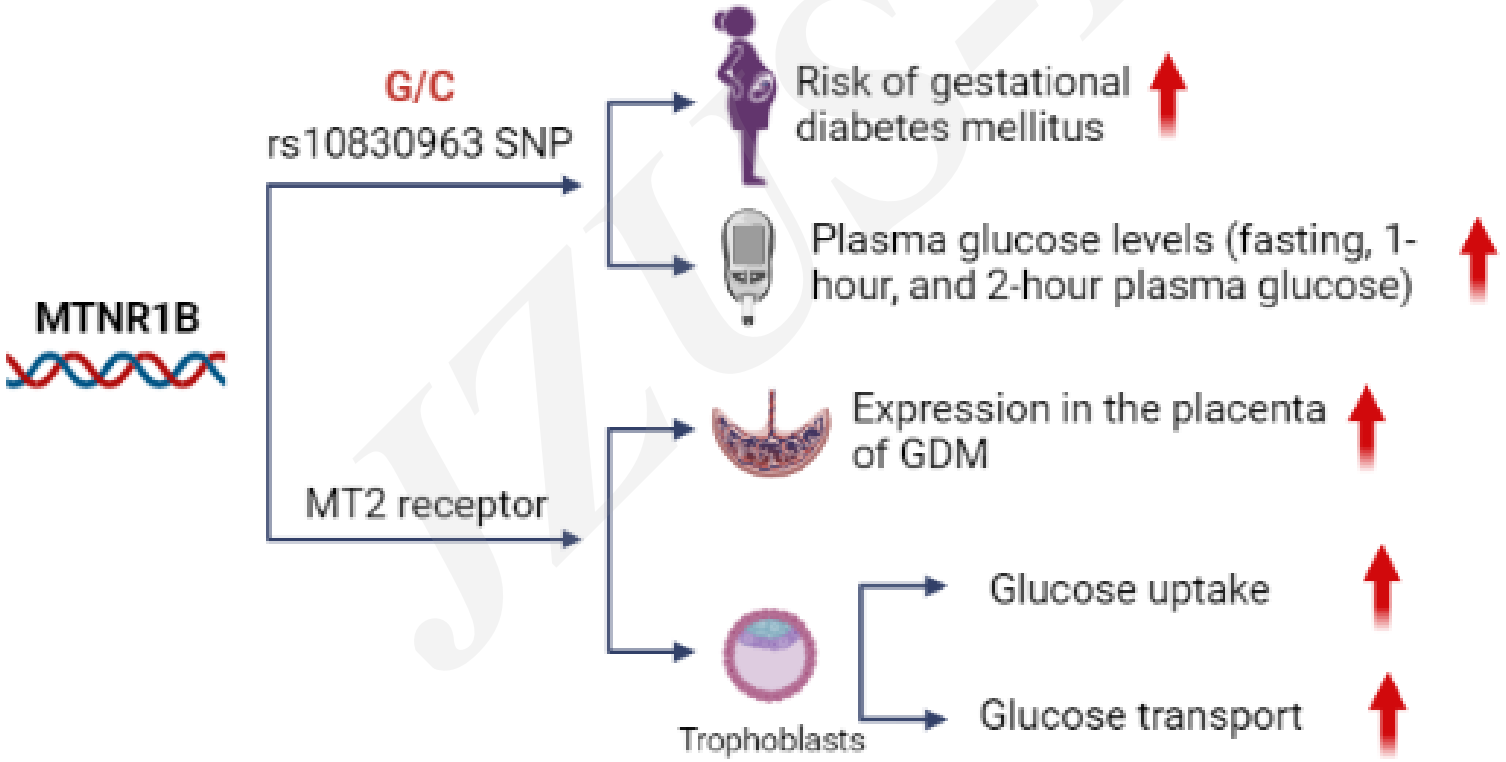
Cite this as: Lijie WEI, Yi JIANG, Peng GAO, Jingyi ZHANG, Xuan ZHOU, Shenglan ZHU, Yuting CHEN, Huiting ZHANG, Yuanyuan DU, Chenyun FANG, Jiaqi LI, Xuan GAO, Mengzhou HE, Shaoshuai WANG, Ling FENG, Jun YU. Role of melatonin receptor 1B gene polymorphism and its effect on the regulation of glucose transport in gestational diabetes mellitus[J]. Journal of Zhejiang University Science B, 2023, 24(1): 78-88. http://doi.org/10.1631/jzus.B2200136

Role of melatonin receptor 1B gene polymorphism and its effect on the regulation of glucose transport in gestational diabetes mellitus

Key words: **Gestational diabetes mellitus (GDM); Melatonin receptor 1B (MTNR1B); Single nucleotide polymorphism (SNP); Glucose uptake; Glucose transporters (GLUTs); Peroxisome proliferator-activated receptor gamma (PPARγ)**

Research Summary

This study mainly investigated the relationship between rs10830963 variants and GDM development, and its effects on glucose uptake and transport.



Innovation points

- **Genetic polymorphism of rs10830963 contributed to high plasma glucose levels (fasting, 1-hour, and 2-hour plasma glucose) and gestational diabetes mellitus.**

- **MT2 receptor encoded by MTNR1B genes was predominantly expressed by trophoblasts in the placenta and was increased in gestational diabetes mellitus.**

- **In vitro, melatonin up-regulated glucose uptake and the expression of the GLUT4 via MT2 receptor in trophoblasts, which may be mediated by transcriptional factor PPARγ.**

Innovation points

A series of comprehensive tables and figures were generated to summarize the relationship between rs10830963 variants and GDM development, and the effects of MT2 receptor on glucose uptake and transport in trophoblasts.

Table 1 | Clinical and laboratory parameters of GDM and NP groups.

Table 2 | Genotype and allele frequencies of rs10830963 in GDM and NP groups.

Table 3 | Relationships between rs10830963 and relatively metabolic parameters.

Figure 1 | Expression of MT2 receptor in the placental tissues of pregnant women in GDM and NP groups.

Figure 2 | Effect of melatonin on the expression of glucose transporters, MT2 and PPARγ.

Figure 3 | Melatonin regulates the expression of glucose transporter and PPARγ via MT2 receptor.