

Study on the mechanism of metformin in improving PGRN-induced insulin resistance of 3T3-L1 cell

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[ABSTRACT]

AIM: To investigate the effect of metformin on the PERK-eIF2 α pathway in PGRN - induced insulin - resistant cell model.

METHODS: The 3T3-L1 Insulin-resistance cell model was constructed by dexamethasone and PGRN. Metformin was used to act on the cell model to screen out the optimal concentration group for reducing PGRN, The experiment was divided into the normal control group, dexamethasone group, and PGRN group. 4-PBA and metformin were used to act respectively. Western Blot was used to detect the expression of insulin signaling factor and PERK-eIF2 α signaling factor in each group.

RESULTS: After the action of PGRN and dexamethasone, p-Akt decreased, p-IRS-1, p-PERK, p-eIF2 α increased while after the treatment with 4-PBA and metformin, p-Akt increased, p-IRS-1, p-PERK, p-eIF2 α decreased. (P<0.05).

CONCLUSION: Metformin acts on the insulin resistance cell model induced by PGRN, and its effect on PERK-eIF2 α pathway and insulin pathway factor is consistent with that of endoplasmic reticulum stress inhibitor 4-PBA. It is suggested that metformin may reverse PGRN-induced insulin resistance by activating AMPK to inhibit the phosphorylation of PERK-eIF2 α , an endoplasmic reticulum stress pathway.

[KEY WORDS] 3T3-L1 cell; insulin resistance cell model; metformin; progranulin (PGRN); PERK-eIF2 α pathway

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