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2,7"- Phloroglucinol-6,6'-bieckol protects INS-1 pancreatic β cells against high glucose-induced apoptosis

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Background: Impaired function and decreasing numbers of pancreatic β cells are key factors in development of type 2 diabetes.

Aim: The aim of this study is to investigate whether 2,7"-phloroglucinol-6,6'-bieckol protects INS-1 pancreatic β cells against high glucose-induced glucotoxicity and apoptosis.

Results: High-glucose (30 mM) treatment led to glucotoxicity and induced apoptosis in INS-1 pancreatic β cells. But treatment with 10~50 μM of 2,7"-phloroglucinol-6,6'-bieckol significantly alleviated the glucotoxicity and increased the cell viability. The treatment with 2,7"-phloroglucinol-6,6'-bieckol decreased dose dependently intracellular reactive oxygen species, lipid peroxidation, and nitric oxide levels increased by high glucose treatment. Furthermore, 2,7"-phloroglucinol-6,6'-bieckol significantly reduced pro-apoptotic Bax, caspase 9, and caspase 3 expressions, whereas it increased anti-apoptotic Bcl-2 and PARP expressions. When the type of cell death was identified using annexin V/propidium iodide staining, 2,7"-phloroglucinol-6,6'-bieckol significantly decreased the numbers of early apoptotic and late apoptotic cells induced by high glucose.

Conclusion: These results suggest that 2,7"-phloroglucinol-6,6'-bieckol might be useful as a potential pharmaceutical agent to protect the pancreatic β cells against high glucose-induced apoptosis.

Biography

Ji Sook Han is a Professor and is doing research on developing a bioactive compound from natural plants, especially seaweeds, and investigating its effect for the prevention and treatment of obesity and type 2 diabetes. The active compound containing in seaweeds may be a good anti-diabetic source by improving insulin secretary defect or insulin resistance. It may also be a potential anti-obesity source owing to its inhibitory effect on adipogenesis. She evaluates the effect and mechanism of a bioactive compound isolated from natural plant through *in vitro* and *in vivo* study.

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