

PubMed Results

Item 1 of 1

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Oxidative stress induces phosphoenolpyruvate carboxykinase expression in H4IIE cells.

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Abstract

Oxidative stress is closely associated with diabetes and is a major cause of insulin resistance. Impairment of hepatic insulin action is thought to be responsible for perturbations in hepatic glucose metabolism. In this study, we found that oxidative stress is involved in the dysregulation of gene expression of phosphoenolpyruvate carboxykinase (PEPCK), a key gluconeogenic enzyme, by a mechanism independent of insulin. Elevation of oxidative stress by injection of ferric nitrilotriacetate in rats increased the expression of hepatic PEPCK mRNA. To examine the direct action of oxidative stress on PEPCK expression, we treated H4IIE hepatoma cells with buthionine sulfoximine (BSO), an inhibitor of glutathione synthesis. BSO increased intracellular oxidative stress and the expression of PEPCK mRNA. Inhibition of p38 mitogen-activated protein kinase (p38 MAP kinase), which mediates responses to oxidative stress, suppressed the induction of PEPCK mRNA by BSO. These results suggest that oxidative stress dysregulates hepatic PEPCK expression by an insulin-independent mechanism.

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