

# Verification of the antidiabetic effects of cinnamon (*Cinnamomum zeylanicum*) using insulin-uncontrolled type 1 diabetic rats and cultured adipocytes.

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## Abstract

It has long been believed that an intake of cinnamon (*Cinnamomum zeylanicum*) alleviates diabetic pathological conditions. However, it is still controversial whether the beneficial effect is insulin-dependent or insulin-mimetic. This study was aimed at determining the insulin-independent effect of cinnamon. Streptozotocin-induced diabetic rats were divided into four groups and orally administered with an aqueous cinnamon extract (CE) for 22 d. The diabetic rats that had taken CE at a dose of more than 30 mg/kg/d were rescued from their hyperglycemia and nephropathy, and these rats were found to have upregulation of uncoupling protein-1 (UCP-1) and glucose transporter 4 (GLUT4) in their brown adipose tissues as well as in their muscles. This was verified by using 3T3-L1 adipocytes in which CE upregulates GLUT4 translocation and increases the glucose uptake. CE exhibited its anti-diabetic effect independently from insulin by at least two mechanisms: i) upregulation of mitochondrial UCP-1, and ii) enhanced translocation of GLUT4 in the muscle and adipose tissues.

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