



Potentialiation of neuronal insulin signaling and glucose uptake by resveratrol: the involvement of AMPK

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Abstract:

Resveratrol (RSV), a polyphenolic phytoestrogen, has been shown to activate the serine/threonine kinase 5'-adenosine monophosphate-activated protein kinase (AMPK) and to stimulate insulin signaling and glucose uptake in skeletal muscle cells. A direct effect of RSV on neuronal insulin signaling, however, has not been demonstrated. Here, we report that RSV stimulates glucose uptake and potentiates insulin signaling in Neuro-2A (N2A) cells, which is characterized by the increased phosphorylation of protein kinase B (Akt) and glycogen synthase kinase-3 β (GSK-3 β). Furthermore, RSV activates AMPK in N2A cells, which can be prevented using a specific pharmacological inhibitor, Compound C. Compound C abrogates RSV-induced Akt and GSK-3 β phosphorylation and glucose uptake. Thus, we demonstrate that RSV potentiates insulin signaling and glucose uptake *via* AMPK activation in neuronal cells.

Key words:

resveratrol, AMPK, neuronal insulin signaling, glucose uptake

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