

# Abstract

J Biol Chem. 2011 Jan 7;286(1):60-6.

## Up-regulation of Adiponectin by resveratrol: the essential roles of the Akt/FOXO1 and AMP-activated protein kinase signaling pathways and DsbA-L.

Wang A, Liu M, Liu X, Dong LQ, Glickman RD, Slaga TJ, Zhou Z, Liu F.

Metabolic Syndrome Research Center, Second Xiangya Hospital, Central South University, Hunan 410011, China.

**OBJECTIVE:** The natural polyphenol resveratrol (RSV) displays a wide spectrum of health beneficial activities, yet the precise mechanisms remain to be fully elucidated. Here we show that RSV promotes the multimerization and cellular levels of adiponectin in 3T3-L1 adipocytes.

**METHODS AND RESULTS:** The stimulatory effect of RSV was not affected by knocking out Sirt1, but was diminished by suppressing the expression levels of DsbA-L, a recently identified adiponectin-interactive protein that promotes adiponectin multimerization. Suppression of the Akt signaling pathway resulted in an increase in the expression levels of DsbA-L and adiponectin. On the other hand, knocking out FOXO1 or suppressing the activity or expression levels of the AMP-activated protein kinase (AMPK) down-regulated DsbA-L and adiponectin. The stimulatory effect of RSV on adiponectin and DsbA-L expression was completely diminished in FOXO1-suppressed and AMPK-inactivated 3T3-L1 adipocytes.

**CONCLUSIONS:** Taken together, our results demonstrate that RSV promotes adiponectin multimerization in 3T3-L1 adipocytes via a Sirt1-independent mechanism. In addition, we show that the stimulatory effect of RSV is regulated by both the Akt/FOXO1 and the AMPK signaling pathways. Last, we show that DsbA-L plays a critical role in the promoting effect of RSV on adiponectin multimerization and cellular levels.

PMID: 20980258

