

Abstract

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Effect of retinoic acid on leptin, glycerol, and glucose levels in mature rat adipocytes in vitro.

Hong SE, Ahn IS, Jung HS, Rayner DV, Do MS.

School of Life and Food Sciences, Handong Global University, Pohang, Kyungbuk, South Korea.

OBJECTIVE AND METHODS: To elucidate the effects of retinoic acids (RAs) on adipogenesis and insulin sensitivity, we treated mature adipocytes with two different kinds of RA, 9-cis-RA and all-trans-RA.

RESULTS: Both 9-cis- and all-trans-RA inhibited the secretion of leptin. However, the inhibition was significantly decreased at a higher dose of each RA. The inhibitory effect of 9-cis-RA was synergistically enhanced by the addition of rosiglitazone, a synthetic ligand for peroxisome proliferator-activated receptor (PPAR) gamma. 9-cis-RA also leads to adipogenesis in a dose-dependent manner. On the contrary, all-trans-RA does not increase adipogenesis in a dose-dependent manner. To clarify the antidiabetic effects of RA, glucose uptake was assessed by estimating glucose concentrations in the medium. 9-cis-RA reduced glucose levels in the culture media, but all-trans-RA did not.

CONCLUSION: In conclusion, all-trans-RA does not alter adipogenesis and glucose uptake but does inhibit leptin secretion. 9-cis-RA, however, seems to increase both adipogenesis and glucose uptake through activation of the retinoid X receptor/PPARgamma heterodimer.

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