

## ***Rosa acicularis* Leaves Exert Anti-obesity Activity through AMPK-dependent Lipolysis and Thermogenesis in Mouse Adipocytes, 3T3-L1 Cells**

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It has been reported that *Rosa acicularis* has anti-obesity activity by inhibiting the digestive lipase activity. However, there is a lack of clear in vitro studies regarding the anti-obesity activity of *Rosa acicularis*. Therefore, in this study, we aimed to verify the anti-obesity activity of *Rosa acicularis* leaves (RAL) and elucidate its mechanism of action in 3T3-L1 preadipocytes. RAL dose-dependently inhibited the accumulation of lipid droplets and triacylglycerol. RAL had no effect on cell proliferation and survival in undifferentiated 3T3-L1 cells, but it inhibited cell proliferation in differentiating 3T3-L1 cells. RAL increased ATGL, p-HSL, and HSL, and decreased perilipin-1 in differentiating 3T3-L1 cells. In addition, RAL reduced lipid droplet accumulation and increased free glycerol content in differentiated 3T3-L1 cells. RAL increased ATGL and HSL in differentiated 3T3-L1 cells. Also, RAL increased p-AMPK, PPAR $\gamma$ , UCP-1, and PGC-1 $\alpha$  in differentiating 3T3-L1 cells. AMPK inhibition by Compound C attenuated RAL-mediated increase of ATGL, HSL, PPAR $\gamma$ , and UCP-1 in 3T3-L1 cells. Taken together, it is thought that RAL may inhibit lipid accumulation through lipolysis and thermogenesis via the activation of AMPK in adipocytes.

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