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Anti-diabetic activities of chalcone derivatives: Induction of adipocyte differentiation and enhancement of glucose uptake in adipocyte.

(カルコン誘導体の抗糖尿病作用：脂肪細胞分化誘導および脂肪細胞におけるグルコース取り込み誘導)

Diabetes mellitus is a chronic disease that is characterized by hyperglycemia caused by insufficiency of the insulin action. We had already found that 4-hydroxyderricin (4HD) and xanthoangelol (XA) extracted from Ashitaba (*Angelica keiskei*) had two insulin mimetic activities, induction of adipocyte differentiation and enhancement of glucose uptake, But the glucose uptake enhancement activity of 4HD is several times higher than that of XA. Then, we investigated the correlations between structure and insulin mimetic activities of chalcone derivatives to develop more efficient chalcones as lead compounds of medicine to cure diabetes. Insulin mimetic activities were examined whether each sample can be replace the insulin in differentiation of 3T3-L1 pre-adipocyte and glucose uptake in 3T3-L1 adipocyte. As results, we found that 4'-methoxy substitution and 3'-aliphatic substitution increase the glucose uptake and adipocyte differentiation activities. Furthermore, we also found that several chalcone derivatives have higher insulin mimetic activities than 4HD and XA. Our results suggest that our chalcone derivatives may be promising leading compounds to the new type medicine for diabetes mellitus.