

Fucoxanthin Promotes Translocation and Induction of Glucose Transporter 4 in Skeletal Muscles of Diabetic/obese KK- A^y Mice

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Fucoxanthin (Fx) isolated from *Undaria pinnatifida* suppresses the development of hyperglycemia and hyperinsulinemia of diabetic/obese KK- A^y mice after 2 weeks of feeding 0.2% Fx-containing diet. In the soleus muscle of KK- A^y mice that were fed Fx, glucose transporter 4 (GLUT4) translocation to plasma membranes from cytosol was promoted. On the other hand, Fx increased GLUT4 expression levels in the extensor digitorum longus (EDL) muscle, although GLUT4 translocation tended to increase. The expression levels of insulin receptor (IR) mRNA and phosphorylation of Akt, which are in upstream of the insulin signaling pathway regulating GLUT4 translocation, were also enhanced in the soleus and EDL muscles of the mice fed Fx. Furthermore, Fx induced peroxisome proliferator activated receptor gamma coactivator-1 alpha (PGC-1 alpha), which has been reported to increase GLUT4 expression, in both soleus and EDL muscles. These results suggest that in diabetic/obese KK- A^y mice, Fx improves hyperglycemia by activating the insulin signaling pathway, including GLUT4 translocation, and inducing GLUT4 expression in the soleus and EDL muscles, respectively, of diabetic/obese KK- A^y mice.