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### **Mechanical stretch activates glycometabolism-related enzyme through estrogen in C2C12 myoblasts**

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**Objective** Exercise is involved with some Metabolic diseases, moderate exercise may improve glycometabolism and type 2 diabetes mellitus in menopausal female. Previous study showed that exercise increased the level of muscular estrogen in Ovariectomized rats, improved muscle mass and glycometabolism, it provided a reference to relief type 2 diabetes mellitus symptom. Until now, the effect of estrogen induced by exercise on muscular glycometabolism is not clear, the present study was designed to explore the effect of estrogen induced by mechanical stretch on glycometabolism in mouse C<sub>2</sub>C<sub>12</sub> myoblasts.

**Methods** The mouse C<sub>2</sub>C<sub>12</sub> myoblasts in vitro were plated at BioFlex Culture Plate, and assigned randomly to the control group(C), stretch group(S), SA group. SA group was cultured in growth medium with 400µg/ml anastrozole(aromatase inhibitor), other groups were cultured in GM with DMSO for 36h, and then S, SA groups were stretched by Flexcell FX-5000™ system (magnitude 15%, frequency 1Hz, duration 6hours), Cellular proteins were extracted after 24h of stretch, ELISA assay was used to detect estradiol levels, we detected the expression of HK, PI3K, the ratio of p-AKT and AKT, GLUT4 protein level by Western blotting.

**Results** Compared with the control group, a higher estradiol level was detected in stretch group(P<0.05), and the protein expression of HK, PI3K, the ratio of p-AKT and AKT, GLUT4 is higher(P<0.05) after stretching. The estradiol level and protein expression is lower in SAF group as compare to the stretch group(P<0.05). while there was no significant difference in estradiol level and protein expression between SF group and SAF group(P>0.05).

**Conclusions** Estrogen induced by mechanical stretch can improve glycometabolism-related enzyme and protein expression of mouse C<sub>2</sub>C<sub>12</sub> myoblasts.