

## 2R04 Changes of MCT expression in muscle hypertrophy and atrophy

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### 【 Purpose 】

Previous studies reported that MCTs (Monocarboxylate Transporter) were changed in several conditions. However, it is not known that what is the most effective factor in these changes. Therefore, we investigated the changes of MCT1 and MCT4 protein expression with muscle hypertrophy and atrophy condition.

### 【 Methods 】

Male Wistar rats (aged 7wks) were randomly assigned to the control, testosterone and corticosterone group. The testosterone group was injected testosterone (10mg/100mg body weight), whereas the corticosterone group was injected corticosterone (5mg/100mg body weight). After 1 week with the appropriate treatment, plantaris (Pla), soleus (Sol), gastrocnemius (Gastro.), extensor digitorum longus (EDL), tibialis anterior (TA) and heart of all rats were taken and measured their muscle weight and analyzed for MCT1 and MCT4 protein by Western Blotting. In addition, we checked their body weight every day.

### 【 Results & Discussion 】

The muscle weight was significant increased in the testosterone group and significant decreased in the corticosterone group. In muscle hypertrophy condition after testosterone injection, MCT1 and MCT4 protein are significantly increased, whereas in the muscle atrophy condition after corticosterone injection, MCT1 and MCT4 protein are markedly decreased. Therefore, we conclude that the muscle structural changes, such as hypertrophy or atrophy, can affect MCT protein expression.

### 【 Key Words 】

MCT, muscle hypertrophy, muscle atrophy

## 2R05 Effects of endurance training on free radical scavenging activities in human skeletal muscle determined by ESR -SAT project 103-

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**Purpose:** The effect of endurance training on radical scavenging activity (antioxidant capacity) in muscle tissue is still an unknown issue. The present study examined the effect of regular endurance exercise on the radical scavenging activity using electron spin resonance (ESR) and spin-trapping technique. **Method:** Fifteen healthy but sedentary male adults who did not participate in any regular exercise program took part in this study ( $21.3 \pm 3.0$  years; mean  $\pm$  SD). All subjects performed an incremental cycling exercise to evaluate their maximal oxygen uptake ( $\dot{V}O_{2peak}$ ) before and after the 8-week endurance training course period. The training was carried out every other day for 8 weeks, giving each subject a total of 28 sessions. Each training session lasted one hour. The training intensity of the first three sessions was at 60%  $\dot{V}O_{2peak}$ , and was later increased to 70%  $\dot{V}O_{2peak}$ . Muscle tissue samples were obtained by needle biopsy from the vastus lateralis muscle for biochemical analysis. Scavenging activity against superoxide anions ( $O_2^{\cdot -}$ ) and hydroxyl radical ( $HO^{\cdot}$ ) in these specimens were determined by ESR using a spin-trapping chemical (5, 5-dimethyl-1-pyrroline-N-oxide: DMPO). **Result:** Although, the  $\dot{V}O_{2peak}$  and the citrate synthase activity increased after training ( $p < 0.01$ ), the radical scavenging activity against both  $O_2^{\cdot -}$  and  $HO^{\cdot}$  did not significantly change as the result of the 8-week training. **Conclusion:** These findings suggested that ESR and spin-trapping technique would be a useful strategy in order to evaluate scavenging activity against different kind of free radicals in muscle tissue, however, that the 8-week endurance training increase capacity for aerobic power output, without improving antioxidant capacity in muscle tissue.

**Key words:** endurance training, ESR, free radical scavenging activity, human, skeletal muscle