

Actin and creatine in growing soleus and EDL muscle of mouse

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Department of Physiology, UCL, FYMU 5540, B-1200 Brussels, Belgium Soleus and extensor digitorum longus muscles of white mice (NMRI) aged 15-100 days were extracted in KC1 80 mM, TES 1 mM, dithiothreitol 0.1 mM, pH 7. After centrifugation, total creatine (Ct = creatine + phosphocreatine) was measured in the supernatant. The precipitate was dissolved in SDS and actin was separated by electrophoresis on slab gels 12% PAA and stained with Coomassie Blue. Images of the gels were digitized and the light intensities of the actin zones were integrated, using a specialized software (ELPHOR, BIOCOM) and compared with standard zones of actin. At all ages EDL muscles have higher concentrations of actin and Ct than soleus muscles. At 100 days of age, soleus muscle has 16 $\mu\text{mole per g}$ of Ct and 0.65 $\mu\text{mole per g}$ of actin, while in EDL muscle these concentrations are respectively 23 and 1.05 $\mu\text{mole per g}$. When pooled over all ages and muscles, actin is a linear function of Ct: $[\text{actin}] = 0.055 (\pm 0.004) * (\text{Ct} - 3.8 (\pm 0.6))$. The data suggest existence of two pools of creatine. One pool located in sarcomeres is functionally dependent on actin concentration, keeping a constant ratio of 18 molecules of Ct for every molecule of actin during growth and differentiation into fast or slow muscle. The second pool, presumably located in sarcoplasm remains at a constant concentration of 3.8 $\mu\text{mole per g}$ and may act as a shuttle of P between the first pool and glycolytic/oxidative metabolic pathways.

Fig.17 : l'actine en fonction de la créatine. Les moyennes sont figurées par des cercles pleins.

