

AGE-RELATED MUSCLE ATROPHY IS ASSOCIATED WITH BOTH AN INCREASE IN POLY-UBIQUITINATION AND EXPRESSION OF MUSCLE SPECIFIC UBIQUITIN E3 LIGASE MAFbx

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Activation of the ubiquitin-proteasome system is a fundamental step in the breakdown of skeletal muscle where proteins are specifically targeted for degradation via poly-ubiquitination (poly Ub) by E3 ligase(s). Recently Bodine et al. (2001) reported increased mRNA for the E3 ligase, muscle-specific muscle atrophy F-box (MAFbx), in models of acute skeletal muscle atrophy (e.g. immobilization and denervation). The goal of the current study was to determine if the ubiquitin-proteasome system also plays a role in age-related muscle atrophy. Thus, we examined poly Ub levels (electrochemiluminescence assay) and MAFbx expression (Western blotting) in muscle extracts obtained from adult (18 month) and elderly (27 month) rats. Soleus muscle mass was decreased 20% at 27 months ($p < 0.01$ vs. 18 months). Poly-Ub levels and MAFbx protein increased 4-fold and 3-fold, respectively at 27-months ($p < 0.05$ vs. 18 months). These data suggest that, in addition to acute muscle wasting, the ubiquitin-proteasome system plays a significant role in age-related muscle atrophy.