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The potential benefits of creatine and conjugated linoleic acid as adjuncts to resistance training in older adults.

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Source

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Abstract

Human aging is associated with a significant reduction in muscle mass (sarcopenia) resulting in muscle weakness and functional limitations in the elderly. Sarcopenia has been associated with mitochondrial dysfunction and the accumulation of mtDNA deletions. Resistance training increases muscle strength and size and can increase mitochondrial capacity and decrease oxidative stress in older adults. Creatine monohydrate (CrM) and conjugated linoleic acid (CLA) have biological effects that could enhance some of the beneficial effects of resistance training in older adults (i.e., up arrow fat-free mass, down arrow total body fat). We have completed two resistance-training studies with CrM alone and CrM+CLA supplementation in older adults to evaluate the independent effects of exercise and dietary supplements, as well as their interactive effects. Our studies, and several others, have found that CrM enhanced the resistance exercise mediated gains in fat-free mass and strength. More recently, we found that the addition of CLA also lead to a significant reduction of body fat after six months of resistance training in older adults. Older adults have fewer wild-type mtDNA copies and higher amounts of mtDNA deletions as compared with younger adults in mature skeletal muscle; however, these deletions are not seen in the satellite cell-derived myoblast cultures. These findings, and the fact that mtDNA deletions are lower and wild-type mtDNA copy number is higher after resistance training in older adults, suggests that activation of satellite cells secondary to resistance exercise-induced muscle damage can dilute or "shift" the proportion of mtDNA genotype towards that of a younger adult. Recent evidence suggests that CrM supplementation in combination with strength training can enhance satellite cell activation and total myonuclei number per muscle fiber in young men. Future studies are required to determine whether the mitochondrial adaptations to resistance exercise in older adults are further enhanced with CrM supplementation and whether this is due to increased recruitment

of satellite cells. It will also be important to determine whether these changes are maintained over a longer time period.