

IGF-I Gene Expression in Response to Exercise and Ischemia-Reperfusion

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Muscle regeneration and hypertrophy are relevant processes in the daily function of the human body, whether you engage in limited or aggressive physical activity. Any type of mechanical loading on your muscles requires to some degree, regeneration and adaptation of muscular components. IGF-I stimulates the muscle regeneration process, indicating its vital role in the muscle adaptation process. The overall goal of this research is to determine the mechanisms that regulate IGF-I signaling during muscle regeneration. Published data suggests that in models of muscle ischemia-reperfusion and overload, muscle IGF-I gene expression is increased, even in the absence of pituitary GH. In this study, IGF-I gene expression was measured in muscles after mice were subjected to a novel, physiologically relevant regime of resistance exercise. Two different strains of mice were used, one a wild-type and the other in which the liver IGF-I gene was deleted, resulting in serum IGF-I deficiency with elevated GH secretion. We hypothesized that muscle IGF-I gene expression would be increased in muscles from both genotypes, but that the response would be enhanced in LID mice owing to GH hypersecretion. IGF-I gene expression was also measured in rat muscles after hindlimb ischemia-reperfusion. Real-time PCR data reveals upregulation of IGF-I gene expression in both models of muscle re-modeling and an augmented response due to GH hypersecretion.