

## **Skeletal muscle fiber hyperplasia.**

### **BRIEF REVIEW**

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#### **Abstract:**

ANTONIO, J. A. and W. J. GONYEA. Skeletal muscle fiber hyperplasia. Med. Sci. Sports Exerc., Vol. 25, No. 12, pp. 1333-1345, 1993. Skeletal muscle enlargement in adult animals has been ascribed primarily to changes in fiber cross-sectional area (i.e., fiber hypertrophy); however, recent evidence from several laboratories suggests strongly that fiber hyperplasia contributes to muscle mass increases in adult animals and possibly human athletes. Scientists have used three models to study the cellular mechanisms of muscle enlargement: compensatory hypertrophy, stretch, and exercise. Each of these models has provided direct as well as indirect evidence supporting the occurrence of muscle fiber hyperplasia. Direct counts of muscle fibers using nitric acid digestion techniques have shown that both exercise and stretch overload result in significant increases (range = 9-52%) in fiber number. Indirect fiber counts using histological cross-sections have suggested fiber hyperplasia (range = 10-82%) in all three models. Additionally, the expression of embryonic myosin isoforms have provided indirect evidence for new fiber formation in stretch overloaded muscle. Furthermore, satellite cells have been shown to be involved in muscle fiber hyperplasia in stretch and exercise.

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