Changes in the myosin isoforms expressed during transformation of skeletal muscle phenotype

University of Birmingham - CFTR CF transmembrane conductance regulator [Homo sapiens (human)]


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Young Investigator Section

Research article

ADAPTIVE CHANGES OF MYOSIN ISOFORMS IN RESPONSE TO LONG-TERM STRENGTH AND POWER TRAINING IN MIDDLE-AGED MEN

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ABSTRACT
The purpose of the study was to examine the adaptive changes in myosin heavy chain (MHC) and light chain (MLC) isoforms in human *vastus lateralis* muscle caused by long-term strength and power training (54 weeks, approximately 3 times a week) in untrained middle-aged men (16 in the training and 6 in the control group). Muscular MHC and MLC isoforms were determined by means of SDS-PAGE gel electrophoresis. During the training period, maximal anaerobic cycling power increased by 64 W ($p < 0.001$) and the maximal jumping height by 1.5 cm ($p < 0.05$) in the training group, but no significant changes were found in the control group. However, the group by time effect was not significant. In the training group, the increase of the maximal jumping height correlated with the number of strength and power training sessions ($r = 0.56$; $p < 0.05$). The change of the proportion of MHC IIa isoform from 52.6 ± 12.2% to 59.4 ± 11.6% did not reach statistical significance ($p = 0.070$ for group by time; within training group $p = 0.061$) and neither did the change of the proportion of MHC IIx isoform from 18.1 ± 11.4% to 11.1 ± 9.1% ($p = 0.104$ for group by time; within training group $p=0.032$). The degree of change of MHC IIx isoform correlated with the amount of earlier recreational sports activity ($r = 0.61$; $p < 0.05$). In the training group, the changes of MLC1s isoform correlated negatively with the changes of MLC1f isoform ($r = -0.79$; $p < 0.05$) as well as with the changes in maximal anaerobic cycling power ($r = -0.81$; $p < 0.05$), and positively with those of MHC I isoform ($r = 0.81$; $p < 0.05$). In conclusion, the long-term strength and power training ~3 times a week seemed to have only slight effects on fast MHC isoforms in the *vastus lateralis* muscle of untrained middle-aged men; the proportion of MHC IIa tended to increase and that of MHC IIx tended to decrease. No changes in MLC isoform profile could be shown.

KEY WORDS: Anaerobic muscular power, contractile proteins, myosin heavy chain isoforms, myosin light chain isoforms, training, transformation.

Description: -
-Changes in the myosin isoforms expressed during transformation of skeletal muscle phenotype
-Changes in the myosin isoforms expressed during transformation of skeletal muscle phenotype
Notes: Thesis (Ph.D.) - University of Birmingham, Dept of Anatomy.
This edition was published in 1985

Tags: #CFTR #CF #transmembrane #conductance #regulator #[Homo #sapiens #(human)]

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The most frequently occurring mutation in cystic fibrosis, DeltaF508, results in impaired folding and trafficking of the encoded protein. Mutations in this gene cause cystic fibrosis, the most common lethal genetic disorder in populations of Northern European descent. Am J Physiol Lung Cell Mol Physiol, 2020 Nov 1.

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. This section includes genomic Reference Sequences RefSeqs from all assemblies on which this gene is annotated, such as RefSeqs for chromosomes and scaffolds contigs from both reference and alternate assemblies. Nat Commun, 2020 Aug 26.

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These reference sequences are curated independently of the genome annotation cycle, so their versions may not match the RefSeq versions in the current genome build.

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The encoded protein functions as a chloride channel, making it unique among members of this protein family, and controls ion and water secretion and absorption in epithelial tissues. Model RNAs and proteins are also reported here.

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