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[ADVANCED](#)[TOP](#) > [Available Issues](#) > [Table of Contents](#) > [Abstract](#)

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[\[PDF \(350K\)\]](#) [\[References\]](#)**Effects of stretching stress on the muscle contraction proteins of skeletal muscle myoblasts**Koji SAKIYAMA¹⁾, Shinichi ABE¹⁾²⁾, Yuichi TAMATSU³⁾ and Yoshinobu IDE¹⁾

1) Department of Anatomy, Tokyo Dental College

2) Oral Health Science Center and Department of Anatomy, Tokyo Dental College

3) Department of Neurology Gross Anatomy Section, Kagoshima University Graduate School of Medical and Dental Sciences

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ABSTRACT

Several studies have reported that growth and differentiation of cultured myoblasts can be facilitated by applying appropriate mechanical stimulus. However, the effects of mechanical stimulus on the characteristics of muscle fibers have not yet been fully elucidated. In this study, we gave mechanical stress to C2C12 cells, which were myoblasts derived from mice skeletal muscle. The following myosin heavy chain (MHC) isoforms were investigated in order to clarify muscle characteristics: MHC-2b, 2d and 2a, all of which are fast-twitch fibers. After inoculating cells on a silicone chamber, the chamber was mechanically stretched, and a LightCycler™ was used to measure the mRNA expression of each MHC isoform at several times. The results showed that, with mechanical stretching, the expression of MHC-2b was initially high. On the other hand, without stretching, the expression of MHC-2d increased over time, but with stretching, it was hardly seen. Furthermore, the expression of MHC-2a was significantly high in the stretching group. These results of this study suggest that, when intermittently stimulated, myoblasts express increased levels of MHC-2a isoform. Therefore, it is indicated that myocytes respond to environmental changes not only to facilitate growth and differentiation, but also to alter muscle function actively at the MHC isoform level.



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