An *In Vitro* Contraction Model in Mouse Primary Cultured Myotubes Using Satellite Cells Originated from the EDL and Soleus Muscles

YASUKO MANABE^{*1)}, SHINYA OGINO^{*1)}, MIYUKI ITO^{*1)}, YASURO FURUICHI^{*1)},
MAYUMI TAKAGI^{*1)}, MIO YAMADA^{*1)}, NAOKO GOTO-INOUE^{*1) 2)},
YUSUKE ONO^{*3)}, NOBUHARU L. FUJII^{*1)}

^{*1)}Department of Health Promotion Sciences, Graduate School of Human Health Sciences, Tokyo Metropolitan University, Tokyo, Japan, ^{*2)} Department of Marine Science and Resources, College of Bioresource Sciences, Nihon University, Kanagawa, Japan, ^{*3)} Department of Stem Cell Biology, Atomic Bomb Disease Institute, Graduate School of Biomedical Sciences, Nagasaki University, Nagasaki, Japan

Purpose: Skeletal muscle cell lines such as mouse C2C12 cells and rat L6 cells often show abnormal characteristics because of repeated-passages cultures and artificial culture conditions. Primary myotubes are considered to retain their *in vivo* properties. Here, satellite cells originating from the extensor digitorum longus (EDL) or soleus muscle were differentiated into primary myotubes and used for an *in vitro* contraction model.

Materials and Methods: Satellite cells from the mouse EDL or soleus were isolated by a single-fiber isolation method. We examined the formation of the sarcomere assemblies by α -actinin immunostaining in the differentiated myotubes. We also investigated the contractile characteristics of myotubes stimulated with an electric pulse and insulin induced-glucose uptake. C2C12 myotubes were used for comparison with the primary myotubes.

Results and Discussion: The sarcomere assemblies were observed in the primary myotubes but hardly observed in the C2C12 myotubes. The number of myotubes responding to stimulation by the electric pulse was increased in both the C2C12 and primary myotubes, although the movement in the primary myotubes was larger than that in C2C12 myotubes. The glucose uptake stimulated by insulin was significantly increased compared to the basal uptake in the primary myotubes and the C2C12 myotubes. These data suggest that the mouse primary myotubes, with their greater number of sarcomere assemblies and higher level of contractive activity, will be valuable as an *in vitro* contraction model that can be used in place of cell lines or human primary myotubes.

Key words: skeletal muscle, primary myotubes, contraction

Corresponding author: Nobuharu L. Fujii

Department of Health Promotion Sciences, Graduate School of Human Health Sciences, Tokyo Metropolitan University
1-1 Minami-Osawa, Hachioji-shi, Tokyo 192-0397, Japan

TEL: +81-42-677-2966 FAX: +81-42-677-2961 E-mail: fujiin@tmu.ac.jp

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