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DISCOVERY OF MUSCLE CONTRACTION REGULATED MYOKINE SECRETION IN C2C12 MYOTUBES

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Skeletal muscle has been understood as a secretory organ providing many different bioactive factors, named as myokines. However, there was no evidence that shows muscle contraction triggers secretion of myokines as a practical matter. We noticed that change in cell culture medium unexpectedly excites release of abundant proteins from C2C12 myotubes and those proteins obscures the contraction-stimulated myokine secretion. Once the released proteins were eliminated, increase in secretion of interrokine-6 (IL-6), which is the best-known myokine, was observed by muscle cell contraction evoked by electrical stimulation without cell injury. Using this novel experimental condition, we also discoverd that calcium chelating, rather than elimination of muscle fiber movement by a chemical inhibitor, blocked muscle contraction-induced IL-6 secretion from the C2C12 myotubes.

In summary, we showed that acute muscle contraction evidently pormotes myokine secretion, and our novel experimental condition is useful for investigating the mechanism secretion of myokines in skeletal muscle cell and for novel myokine discovery in further studies.

Key words; myokine, skeletal muscle, muscle contraction, secretion