**B-1-1 Effects of muscle contraction mode on intracellular signaling related in protein synthesis in human skeletal muscle**

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**Purpose:** To investigate the effects of concentric (CON) and eccentric (ECC) contraction on intracellular signaling pathway related in protein synthesis in human skeletal muscle. **Methods:** Eight healthy male subjects (age = 22 ± 1 y-o) performed 10 unilateral maximal isokinetic concentric or eccentric knee extensions (±90 deg/sec) × 4 sets. Muscle biopsies (~15 mg) were obtained from the vastus lateralis 30 min before, 1 and 3 h after the each exercise. Muscle samples were analyzed using immunoblot and immunohistochemical analyses. **Results:** mTOR and its downstream S6K1 phosphorylation after CON contractions significantly increased at 3h after exercise compared with resting relays. On the other hand, the significantly increase of mTOR and S6K1 phosphorylation after ECC contractions were observed at 1h after exercise, and maintained at 3h after exercise. At 1h after ECC contractions, phospho-S6 was significantly increased in Type I and IIa muscle fibers compared with resting relays, but not in Type IIx muscle fibers. **Discussion:** ECC contractions activates intracellular signaling pathway related in protein synthesis in human skeletal muscle in faster than CON contractions, suggesting that ECC contractions can promote muscle protein synthesis compared with CON contractions.

**Key words:** muscle protein synthesis, signaling pathway, concentric and eccentric contraction

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**B-1-2 The effects of the differences of exercise intensity in cycling on the activation in intracellular signaling pathways**

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**Purpose:** To investigate the effects of the differences of exercise intensity in cycling on the activation in intracellular signaling pathways in young men. **Methods:** Six young men performed 20 min of cycling sessions at exercise intensities equivalent to lactate threshold (LT) and onset of blood lactate accumulation (OBLA) separated by about a month in random order. In both sessions, muscle samples were taken before exercise and at 30 min and 60 min after exercise and muscle thickness of anterior aspect of thigh (MT) was evaluated by B-mode ultrasound before and immediately after exercise. **Results:** MT significantly (Time effect: p<0.01) increased after an exercise in both LT and OBLA sessions. S6K1 ([LT] Ex30 : 3.3±0.9 times, Ex60 : 12.2±5.3 times/ [OBLA] Ex30 : 5.0±1.9 times, Ex60 : 10.2±3.0 times) and ERK1/2 ([LT] Ex30 : 1.5±0.2 times, Ex60 : 4.7±1.3 times/ [OBLA] : Ex30 : 3.3 ± 0.7 times, Ex60 : 4.1 ± 1.0 times) phosphorylation significantly (Time effect: p<0.05) increased after an exercise in both conditions. **Conclusion:** Cycling at exercise intensities equivalent to both LT and OBLA can activate mammalian target of rapamycin and mitogen-activated protein kinase signaling pathways.

**Key words:** cycle exercise, cell signaling, muscle hypertrophy, endurance exercise, biopsy