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Proteomic analysis of proteins regulate ATGL lipolytic activity in skeletal muscle

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Intramuscular lipid provides much of the energy for prolonged exercise in well-trained athlete. Adipose triglyceride lipase (ATGL) was identified as a main triglyceride lipase in adipose tissue. Recent studies provided evidence that ATGL also plays an important role in intramuscular lipid breakdown and provide fatty acid for ATP synthesis. However, the molecular mechanisms which regulate ATGL activity in skeletal muscle are not completely understood. To identify the regulatory mechanisms of ATGL activity during exercise, we performed proteomic analysis of proteins associate or dissociate with ATGL during exercise in skeletal muscle. Male Sprague-Dawley rats were exercised by swimming for 3 hours. Immediately after exercise, triceps muscles were dissected out. Muscle homogenates were immunoprecipitated with anti-ATGL antibody overnight at 4℃. The following morning, protein A-agarose beads was added, and the samples were mixed for 1 hour at room temperature with rotation. Precipitated complexes were eluted in citric acid buffer (pH 2.0), and Tris buffer (pH 9.0) were added to neutralized. Eluted proteins were analyzed using a LC-MS/MS. We are expecting identification of proteins which associate or dissociate with ATGL to control lipolytic activity during exercise.