



Exercise Biochemistry Review

Proceedings of IBEC 2018, Beijing, China, October 23-25
PO-266

The regulation mechanism of bcl-2 family on autophagy, apoptosis of motor skeletal muscle cells

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Objective To summarize the localization and regulation mechanism of Bcl-2 family on autophagy and apoptosis of exercise skeletal muscle. In order to provide new Intervention idea for metabolic diseases, sports injuries and post-game recovery of sports skeletal muscle.

Methods In the academic network of , CNKI, CQVIP, Wanfangshujujiyuanxitong-xueshuqikan, Elsevier Science Direct, and Journals@Ovid Full Text and other academic journals, search for Chinese and foreign literatures such as Bcl-2 protein, skeletal muscle, autophagy and apoptosis, and sort more than 170 articles, More than 50 articles are in line with the requirements, and the final reference is 49 articles.

Results 1) The regulation of Bcl-2 family proteins on apoptosis of exercise skeletal muscle autophagy was divided into localization and streaming regulation; 2) Bcl-2 is located in the endoplasmic reticulum and binds beclin-1 to form a complex, Through stimulating ampk-ulki/akt-mtor pathway, FoxO, GAMKK underground, etc., the release signal of motor stress interferes with the decomposition of bcl-2-beclin-1 complex, releasing Beclin-1, activating autophagy; 3) The bcl-2 family protein is located in the mitochondrial membrane, exercise stress releases apoptotic signals→ BH3s activation or liberation of pro-apoptotic subfamily activity → recruitment of Bcl-2 family translocation to MOM → Bcl-2 family protein oligomerization → formation into MOMP→ finally promotion of cytochrome C Release→ activates apoptosis; 4) On the other hand, the Bc-2 family cooperates with intracellular Ca²⁺ signaling; the JNK phosphorylation pathway; the P53 gene and the ubiquitin protein Atg12 are streaming between autophagy and apoptosis.

Conclusions Autophagy and apoptosis of skeletal muscle cells can eliminate ROS caused by oxidative stress, damaged organelles, misfolded proteins and severely damaged cell tissues, in order to maintain normal energy metabolism of muscle cells, control inflammatory damage, and improve Skeletal muscle cell movement adaptability. The Bcl-2 family is a major regulatory protein that controls apoptosis. It can also target and regulate autophagy in the endoplasmic reticulum. In addition, in coordination with multiple signaling factors, streaming between autophagy and apoptosis. It can be regarded as an important target protein for the intervention of skeletal muscle motor injury and improvement of skeletal muscle motor ability.