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电刺激对2型糖尿病大鼠骨骼肌细胞胰岛素信号通路的影响 [点此下载全文](#)

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摘要:

目的: 观察电刺激对2型糖尿病大鼠骨骼肌细胞胰岛素相关信号转导通路的影响并探讨其内在机制。方法: 取20只OLETF大鼠, 分离趾长伸肌, 按照抑制剂和电刺激干预的不同分为4组, 分别为电刺激组、无电刺激组、compound C+电刺激组和compound C组。用Western 印迹法测定骨骼肌中磷脂酰肌醇3-激酶(phosphoinositide 3-kinase, PI3K)、蛋白激酶B (protein kinase B, PKB/Akt)、细胞外信号调节激酶(extracellular signal-regulated kinase, ERK)的表达和活性变化。结果: 电刺激组骨骼肌细胞中磷酸化PI3K蛋白较无电刺激组显著增加($P<0.05$), Akt磷酸化程度(p-Akt/Akt)较无电刺激组显著增加($P<0.01$); 而ERK磷酸化程度(p-ERK/ERK)与无电刺激组相比, 差异无显著性意义($P>0.05$)。compound C+电刺激组骨骼肌细胞中磷酸化PI3K蛋白较compound C组显著增加($P<0.01$), Akt磷酸化程度(p-Akt/Akt)较compound C组亦显著增加($P<0.01$)。结论: 电刺激诱导骨骼肌收缩可以直接或间接激活骨骼肌PI3K/Akt信号转导通路, 这一过程不依赖于AMPK信号转导通路。

关键词: [葡萄糖载体4](#) [电刺激](#) [糖尿病](#) [信号转导通路](#)

The effects of electrical stimulation on insulin related signal pathway in skeletal muscle of OLETF rats [Download Fulltext](#)

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Abstract:

Objective: To observe the effects of electrical stimulation on insulin related signal pathway in skeletal muscle of Otsuka Long-Evans Tokushima Fatty(OLETF) rats, and to explore the intracellular mechanism. Method: Musculus extensor digitorum longus were isolated from twenty OLETF rats, and then the rats were randomly divided into four groups according to different interventions: electrical stimulation group, non-electrical stimulation group, compound C with electrical stimulation group and compound C group. PI3K, Akt and ERK proteins were detected by Western blot analysis. Result: The phosphorylated PI3K increased obviously in electrical stimulation group compared with non-electrical stimulation group ($P<0.05$). The phosphorylation level of Akt in electrical stimulation group also increased significantly compared with non-electrical stimulation group ($P<0.01$). However, there was no significant difference in phosphorylation level of ERK between electrical stimulation group and non-electrical stimulation group ($P>0.05$). The phosphorylated PI3K increased obviously in compound C with electrical stimulation group compared with compound C group ($P<0.01$). The phosphorylation level of Akt in compound C with electrical stimulation group also increased significantly compared with compound C group ($P<0.01$). Conclusion: Skeletal muscle contractions induced by electrical stimulation directly or indirectly activate PI3K/Akt signal pathway, which is independent of AMPK signal pathway.

Keywords: [glucose transporter type 4](#) [electrical stimulation](#) [diabetes mellitus](#) [signal transduction](#)

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