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FoxO转录因子的活性调控及其对骨骼肌生长发育的调节

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Regulation of FoxO Transcription Factors Activity and Its Functions in Growth and Development of Skeletal Muscle

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摘要 FoxO转录因子受到各种外界刺激而被调控,主要包括胰岛素(insulin)、胰岛素样生长因子 I (IGF- I)、营养状况、细胞因子和应激等。这些外界因素通过FoxO修饰翻译后的复杂组合来调控FoxO的亚细胞定位、DNA结合特性、蛋白质水平和转录活性,这些修饰包括磷酸化、乙酰化、泛酸化 and 甲基化等。现在已证明FoxO参与蛋白质的降解和合成,并且参与调节骨骼肌的生长发育。但FoxO活性调控及其信号途径在骨骼肌中具体的调控机理尚不明确。本文就FoxO的活性调控及其如何参与骨骼肌生长发育进行了综述。

关键词: FoxO转录因子 活性调控 蛋白质降解 蛋白质合成 骨骼肌

Abstract: FoxO transcription factors are regulated by a wide range of external stimuli, including insulin, insulin-like growth factor I (IGF- I), nutritional status, cytokines and oxidative stress. These environmental stimuli control FoxO activity by altering an intricate combination of post-translational modifications of FoxO, such as phosphorylation, acetylation, ubiquitination and methylation, which in turn regulate subcellular localization, DNA-binding properties, protein levels and transcriptional activity. Changes in FoxO activity are somehow involved in regulation of protein degradation and/or protein synthesis, growth and development of skeletal muscle. But the regulation of FoxO activity and the regulatory mechanisms of its signaling pathways in skeletal muscle are a little known. This review summarized the regulation of FoxO activity and its functions in growth and development of skeletal muscle.

Keywords: FoxO transcription factors, activity regulation, protein degradation, protein synthesis, skeletal muscle

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