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Sirt1 Promotes C2C12 Myoblast Cell Proliferation by Myostatin Signaling Pathway

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Abstract : Backgrounds: Previous studies showed that Sirt1 plays an important role in C2C12 myoblast cell proliferation, but the mechanism(s) involved in this process remains unclear. This work was undertaken to determine if Myostatin participates in the regulation of C2C12 proliferation by Sirt1. Methods: We administrated the Sirt1 activator resveratrol, inhibitor Nicotinamide (NAM) and Myostatin inhibitor SB431542 on C2C12 myoblast cells. Cell viability was evaluated by CCK8 assay. The expression of Sirt1 and MyoD were detected by qRT-PCR. Utilizing western blot to determinate the expression of myostatin, P107 and p-P107. Results: Our results showed that resveratrol promoted the proliferation of C2C12 myoblast cells, while NAM suppressed the proliferation of C2C12 myoblast cells; SB431542 promoted the proliferation of C2C12 myoblast cells and attenuated the inhibition effect of NAM on C2C12 myoblast cells proliferation; Resveratrol can significantly increase the expression of Sirt1 and MyoD, decrease the expression of Myostatin, while NAM can significantly down-regulate the expression of Sirt1, MyoD and the phosphorylation of P107(p-P107), but up-regulate the expression of Myostatin and the protein P107; SB431542 can significantly mitigate the effect of NAM on the expression of MyoD, P107, and p-P107. Conclusions: Taken together, these results indicate that Sirt1 promotes the proliferation of C2C12 myoblast cells via Myostatin signaling pathway.

Keywords : Sirt1, C2C12 cells, proliferation, myostatin signaling pathway
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