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成肌性标志物在人骨髓间充质干细胞分化为肌细胞过程中的表达

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Expressions of Myogenic Markers in Skeletal Muscle Differentiation of Human Bone Marrow Mesenchymal Stem Cells

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摘要 目的 研究成肌性标志物在人骨髓间充质干细胞(hBM-MSCs)分化为肌细胞过程中的表达情况。方法 体外培养hBM-MSCs，采用免疫荧光法和RT-PCR检测hBM-MSCs中成肌性标志物MyoD、myogenin及desmin的表达。将1×107个hBM-MSCs经尾静脉注入免疫抑制的mdx小鼠体内，于移植后2～24周处死，采用免疫荧光法和RT-PCR检测小鼠骨骼肌内MyoD、myogenin、desmin和人特异性抗肌萎缩蛋白(Dys)的表达。 结果每100个hBM-MSCs中MyoD、myogenin和desmin阳性细胞数分别为23.5±5.3、30.7±6.2和28.4±5.7，第5代hBM-MSCs中可检测到MyoD、myogenin和desmin mRNA表达。hBM-MSCs移植后2周，mdx小鼠骨骼肌内可检测到少量MyoD和myogenin阳性细胞，4周后可检测到少量desmin阳性细胞。hBM-MSCs移植后2～4周，骨骼肌中开始出现MyoD和myogenin mRNA表达，12～16周较强；移植后8周开始出现desmin mRNA表达，16周后表达渐增强。hBM-MSCs移植后4周，mdx小鼠骨骼肌肌膜可见少量人特异性Dys阳性细胞，8周后开始出现Dys mRNA表达，随着移植后时间延长，Dys表达逐渐增强。 结论hBM-MSCs具有向骨骼肌细胞分化的潜力，能在受体内分化为骨骼肌细胞。在hBM-MSCs分化为肌细胞的过程中，MyoD和myogenin表达上调可能发挥了重要作用。

关键词：

Abstract: "ObjectiveTo investigate the expressions of myogenic markers MyoD, myogenin, and desmin in skeletal muscle differentiation of human bone marrow mesenchymal stem cells (hBM-MSCs). MethodsMyogenic markers MyoD, myogenin, and desmin of hBM-MSCs cultured in vitro were detected by immunofluorescence and RT-PCR. A total of 21 8-to-10 week-old immunosuppressed mdx mice were transplanted with 1×107 passage 5 of hBM-MSCs. The mice were euthanized 2-24 weeks after transplantation, and gastrocnemius muscle were analyzed for human MyoD, myogenin, desmin, and dystrophin (Dys) expressions by immunohistochemistry and RT-PCR. ResultsThe numbers of MyoD-, myogenin-, and desmin-positive cells per 100 hBM-MSCs were 23.5±5.3, 30.7±6.2, and 28.4±5.7, respectively. MyoD, myogenin, and desmin mRNA was observed in passage 5 of hBM-MSCs. After two weeks of hBM-MSCs transplantation, a small number of MyoD-and myogenin-positive cells were observed in skeletal muscle of mdx mice, and desmin-positive cells were observed 4 weeks after transplantation. Expressions of MyoD and myogenin were detected in the muscle of mdx mice 2-4 weeks after hBM-MSCs transplantation, which reached a peak 12-16 weeks later. Desmin was expressed in the muscle of mdx mice 4-8 weeks after transplantation, with much more expression after 16 weeks of transplantation. A small number of Dys-positive cell and Dys mRNA expression were presented in the muscle of mdx mice 4 and 8 weeks after hBM-MSCs transplantation, respectively. The expression of Dys in the muscle of mdx mice increased gradually after transplantation. ConclusionhBM-MSCs have the potential of myogenic differentiation in vitro and contribute to myogenic conversion in xenogeneic animal, during which the up-regulation of MyoD and myogenin expressions may play an important role.

Keywords:

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