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Functional Studies for MASH Gene Family in Muscle Stem Cell

Duchenne Muscular Dystrophy (DMD) is a disorder in which absence of the protein dystrophin results in decreasing muscle mass and progressive loss of muscle function. It is possible that muscle satellite cells, stem cells for skeletal muscle, transplanted into DMD patients will have the potential to replace these damaged tissues. The satellite cells are found in skeletal muscle and are characterized by the expression of muscle specific basic-helix-loop-helix (bHLH) transcription factors MyoD and Myf5. In addition, a continuous supply of myoblasts for the damaged muscle fibers is essential for successful long term therapy. Recently, Dr. Asakura lab cloned new type of bHLH factors from myoblast cDNA, termed MASH3, MASH4 and MASH5. Although, MASH3, MASH4 and MASH5 genes are expressed in myoblasts, the functions for these 3 genes on myogenesis and satellite cells remain to be found. Since bHLH genes play essential roles in many different cell-type determination and differentiation systems during development and regeneration, MASH3, MASH4 and MASH5 genes must possess important functions on satellite cells. Furthermore, it is possible that the modification of gene expression for MASH3, MASH4 and MASH5 in myoblasts would be beneficial to cell therapy.



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