ONE-STEP PURIFICATION OF SKELETAL MUSCLE MYOBLASTS FROM FIBROBLASTS AND SUBSEQUENT EXPANSION USING A LAMININ-COATED SURFACE

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ABSTRACT

Skeletal myoblasts have been extensively used to study muscle growth and differentiation and were recently tested for their application as a cell therapy and gene delivery system to treat muscle and non-muscle diseases. However, fibroblasts contamination in isolated cells from skeletal muscle is one of the long-standing problems for routine expansion. This study aimed to establish a simple one-step process to purify myoblasts, and maintain their purity during expansion. For purification, mixed cells were serially preplated on laminin- and collagen type I-coated surfaces in a different array for 5, 10 and 15 minutes. Immunocytochemical staining with antibodies specific to myoblasts was performed to evaluate myoblast attachment efficiency, purity and yield. It was found that the laminin-coated surface favored the attachment of myoblasts. The highest myoblast purity of (80.7±1.5)% was achieved by 5 minutes of preplating only on the laminin-coated surface with a yield of (58.3±5.3)%. Subsequent expansion after preplating (5 minutes on laminin-coated surface) enhanced myoblast purity due to an increase in myoblast growth than fibroblasts. Myoblast purity was achieved approximately 98% when another preplating was performed during passaging. In conclusion, myoblasts can be purified and efficiently expanded in one step by preplating on a laminin-coated surface, which is a simple and robust technique.