

Isolation and characterization of muscle satellite cells from various species

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Mature functional myofibers are terminally differentiated cells without ability to proliferate. However, skeletal muscle has remarkable regenerative potential. Regeneration of skeletal muscle mainly comes from muscle satellite cells, stem cells that lie on the surface of the myofibres between the plasma lemma and the overlying basal lamina. Satellite cells are quiescent cells that activate to become myoblasts, proliferating progenitor cells. Myoblasts have tendency to fuse either into an existing myofibres to become myonuclei, or fuse together to form myotubes. During myogenesis, myogenic cell repopulate satellite cell pool. Each stage of the myogenic pathway is represented with specific cells with certain gene expression profile and cell surface markers. Satellite cells express Pax7, the hallmark gene for quiescent cell. In this stage cells has unique combination of cell surface markers, CD34⁺CXCR4⁺ α -7 integrin⁺ and sca1⁻. When they become activated they become Myf5 and MyoD positive, and surface marker profile change to CD34⁻CXCR4⁻ α -7 integrin⁺ and sca1⁺. Knowing the surface character of the cells gives us opportunity for their direct isolation and with that exploring their physiology or use those as a source for cell therapy. In this presentation we will speak about specific characteristic of myogenic spaces in various experimental animal models.