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α-Actinin behavior during C2C12 along differentiation

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α-Actinin is a cytoskeletal actin-binding protein (Ogura et al., 2009) that provides structural integrity of the sarcomeres and is located in the skeletal muscle Z-lines. It creates cross-links between actin filaments and, besides, it contributes to cytoskeleton organization and muscle contraction (Sjöblom et al., 2008). The aim of this work was to clear up the behavior of sarcomeric α-actinin in Z-lines formation during myogenic differentiation. For this purpose, C2C12 cells were analyzed at 0, 3, 7 days of differentiation, monitoring cell maturation and viability by means of inverted microscopy. Immuno-labeling of sarcomeric α-actinin was investigated both at CLSM and at TEM, using a mouse anti-α-actinin antibody followed by a FITC-conjugated goat anti-mouse or a 10nm colloidal gold conjugated anti-mouse antibody (Ferri et al., 2009), respectively.

Immunofluorescence analysis reveals that, when differentiation is induced, initially α-actinin colocalizes with membrane-associated proteins, then it aligns longitudinally across the cytoplasm and, finally, it binds actin, giving rise to Z-lines.

Immunogold study generally evidences a cytoplasmic and nuclear positivity, indicating a role for α-actinin in signaling, chromatin remodeling and in shuttle between these compartments (Dingovà et al., 2009; Lin et al., 2010). This study shows an α-actinin specific distribution and dynamic organization along the differentiation process.

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