Extracellular matrix is required for muscle differentiation in primary cell culture of larval *Mytilus trossulus* (Mollusca: Bivalvia)

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Myogenesis involves the processes of cell proliferation, differentiation, migration, cell-cell interactions and development of myofibers. Components of the extracellular matrix (ECM) may modulate the growth factor effects that play an important role in myogenesis and muscle plasticity. Previously, we showed that differentiation into muscle cells occurs during cultivation of mussel cells from premyogenic larval stages and described the synthesis of specific muscle proteins and muscle fiber assembly.
In this study, we examined the interaction of cultured mussel cell with components of ECM using specific muscle antibodies. ECM proteins were found to affect the cell morphology, muscle protein synthesis and their assemblage in myofibril structures. Mussel cells grown on fibronectin or poly-D-lysine had normal bipolar cell morphology and correctly distribution of muscle proteins in cells, while cell spreading and commitment of contractile phenotype of mussel cells cultivated on collagen carpets were inhibited. The results of our experiments with RGDS-peptide, the inhibitor of integrin receptors and cell adhesion, and the control non-specific RGES-peptide suggest that cultivated mussel cells use an integrin-dependent mechanism for adhesion and outgrowth on different ECM substrates. RGDS-peptide blocked cell adhesion and inhibited myogenic differentiation, whereas incubation of the cells with RGES-peptide did not affect myodifferentiation. Finally, we began to analyze of distribution of αvβ3 and β1-subunit of integrins in primary mussel cell culture with the goal of identifying how mechanism of muscle differentiation might be modulated by integrin receptors.
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