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Properties of satellite cell cultures originating from different pig skeletal muscles

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Skeletal muscle fibres exhibit a large range of phenotypes that are characterized by morphological, biochemical and functional properties. However, whether satellite cells from different fibre types have different properties remains controversial depending on the protein analyzed, the culture conditions, and the species studied. The aim of the present study is to determine whether satellite cells originating from two different pig muscles possess different proliferation and differentiation properties when cultured in an identical environment. Satellite cells were harvested from the longissimus (LM, 7% type I fibres) and rhomboideus (RM, 63% type I fibres) muscles of 6 weeks Large White x Pietrain piglets. They were isolated and cultured as previously described by THEIL et al. (2006). Similar amount of satellite cells per gram of muscle was obtained from both muscles ($1.45 \cdot 10^6$ cells). Satellite cells were seeded at $7 \cdot 10^4$ cells per cm^2 , let to proliferate until confluence, and then induced to differentiate for 4 days. BrDU incorporation after 2 days of culture (D2) suggested similar proliferation rates between muscles, and confluence was achieved after 7 days of culture in both muscles. Fusion index after 4 d of differentiation reached 40 to 60%. About 80% of the cells were desmin positive after D5. The MF20 (Myosin Heavy Chain marker) antibody moderately stained some cells at D5, and strongly labelled myotubes during differentiation. Preliminary data suggest similar fusion timing in both muscles. Characterization of myosin heavy chain polymorphism is underway.

References

Theil PK, Sorensen IL, Nissen PM, Oksbjerg N (2006) Temporal expression of growth factor genes of primary porcine satellite cells during myogenesis. Anim Sci J 77, 330-7

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