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Identification and characterization of murine dermal precursor cells with myogenic potential

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We have recently shown that bona fide, pulsating skeletal muscle myofibres may be generated from dermis-derived cells through recreation of 3D myogenic niche (Garcia-Parra et al., 2014). Interestingly, and after one month culture engineered muscle constructs showed progressive degradation of the myofibres concomitant with fatty infiltration, paralleling the natural course of muscular degeneration. However a critical point to translate these results to humans is to determine the origin and identity of myogenic precursor cells enriched within murine dermal cultures. Knowing that dermal and muscle cells share a common embryonic origin at the dermomyotomal stage, and taking into account that there might be different types of cells within adult skin presenting myogenic potential, our main objective was to identify and characterize the origin and identity of myogenic cells present in dermal cultures. To this end, we tested as working hypotheses the enrichment of (i) satellite cells from the dermal *Panniculus carnosus* (PC) muscle, (ii) dermomyotome-derived adult stem/precursor cells, (iii) perivascular cells, and (iv) neural crest-derived precursor cells. In order to trace the origin and identity of dermal myogenic cells, we took advantage of the following transgenic mice to perform lineage tracing experiments: (i) Pax3-GFP and Pax7^{CE} (tracers of PC-derived satellite cells); (ii) Myf5-Cre (dermomyotome), (iii) Cspg4-Cre (perivascular and glial marker), and (iv) Sox10-Cre (neural crest). Cell tracing combined with FACS-based isolation and myogenic differentiation assays showed a major contribution of Myf5+ cells to the dermis-derived myogenic precursor cell subset, which was at least in part derived from PC satellite cells.

Biography

Neia Naldaiz-Gastesi, B.Sc. in Biotechnology by University of Vic (2010) and Master degree in Biomedicine by University of Barcelona (2011). She has worked in different labs during her university studies and has been involved in different scientific projects as an apprentice. At present she is working as a predoctoral student to develop an *in vitro* system for muscle engineering, with some of the results just published. The goal of her PhD project is to identify and characterize a myogenic cell resident in the adult skin of mice and humans and then generate a functional human muscle 3D-culture.

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