An embryonic cell that becomes a cell of muscle fiber.

Bier et al., studied the therapeutic effects of placenta-derived MSCs (PL-MSCs) and their secreted exosomes using mouse and human myoblasts from healthy controls,

Duchenne patients and mdx mice. Treatment of myoblasts with conditioned medium or exosomes secreted by PL-MSCs increased the differentiation of these cells and decreased the expression of fibrogenic genes in DMD patient myoblasts.

In addition, these treatments also increased the expression of utrophin in these cells. Using a quantitative miR-29c reporter, they demonstrated that the PL-MSC effects were partly mediated by the transfer of exosomal miR-29c. Intramuscular transplantation of PL-MSCs in mdx mice resulted in decreased creatine kinase levels. PL-MSCs significantly decreased the expression of TGF-β and the level of fibrosis in the diaphragm and cardiac muscles, inhibited inflammation and increased utrophin expression. In vivo imaging analyses using MSCs labeled with gold nanoparticles or fluorescent dyes demonstrated localization of the cells in the muscle tissues up to 3 weeks post treatment. Altogether, these results demonstrate that PL-MSCs and their secreted exosomes have important clinical applications in cell therapy of DMD partly via the targeted delivery of exosomal miR-29c [1)].

1)
Bier A, Berenstein P, Kronfeld N, Morgoulis D, Ziv-Av A, Goldstein H, Kazimirsky G, Cazacu S, Meir R, Popovtzer R, Dori A, Brodie C. Placenta-derived mesenchymal stromal cells and their exosomes exert therapeutic effects in Duchenne muscular dystrophy. Biomaterials. 2018 May 3;174:67-78. doi: 10.1016/j.biomaterials.2018.04.055. [Epub ahead of print] PubMed PMID: 29783118.