Simposio Internacional: Enfermedades neuromusculares: es el tiempo para el tratamiento
***International Symposium**: Neuromuscular diseases: It's time for treatment*
Madrid, 15 y 16 de noviembre de 2012
Madrid, November 15-16, 2012

Cell therapy for muscular dystrophies

Giulio Cossu

Mesoangioblasts are recently characterized progenitor cells, associated with the vasculature and able to differentiate into different types of solid mesoderm, including skeletal muscle (Minasi et al. Development 2002). When mesoangioblasts were delivered intra-arterially to muscles of dystrophic mice and dogs they resulted in a significant functional amelioration (Sampaolesi et al. Science 2003; Nature 2006). Human adult mesoangioblasts, isolated and expanded in vitro from muscle biopsies, were shown to correspond to a subset of pericytes (Dellavalle et al. Nature Cell Biol. 2007) whose lineage was traced in mice (Dellavalle et al. Nature Comm. 2011).

Based on these results, a monocenter, prospective, non-randomised, clinical phase I/II study of cell therapy with HLA-matched donor human mesoangioblasts in DMD patients started in June 2009, with a one year preliminary study (involving 28 DMD patients, aged 5-10), required to validate outcome measures. Starting on March 2011, three out of these patients (with an HLA-identical donor) underwent successive intra-arterial transplantations at escalating doses of cells, under a continuous regime of immune suppression. Safety was the primary objective of the study. A possible increase in muscle strength as a consequence of mesoangioblast transplantation is also being evaluated. Results will be presented. Ongoing work focuses on the development of Human Artificial Chromosomes encoding the dystrophin locus which was tested successfully in dystrophic mice (Tedesco et al. Sci. Transl. Med. 2011) and is currently being further developed by inserting additional cDNA that would enhance the efficacy of human DMD mesoangioblasts for autologous cell therapy. In parallel iPS cell derived mesoangioblasts (Tedesco et al. Sci. Transl. Med. 2012) have been derived and tested for models of muscular dystrophy where the endogenous number of progenitors may be exhausted or insufficient. Trials with autologous cells may start in a few years.

This work is supported by grants from the European Community (Optistem), the European Research Council, the Medical Research Council, Duchenne Parent Project, Telethon, CureDuchenne, AFM and the Italian Ministries of Research and Health.

*Todos los derechos de propiedad intelectual son del autor. Queda prohibida la reproducción total o parcial de la obra sin autorización expresa del autor.
© FUNDACIÓN RAMÓN ARECES. Todos los derechos reservados.

**All intellectual property rights belong to the author. Total or partial reproduction of the work without express permission of the author is forbidden.*
© FUNDACIÓN RAMÓN ARECES. All rights reserved.