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Transplantation of microencapsulated Sertoli cells in a mouse model of Duchenne muscular dystrophy (DMD) reduces inflammation and rescues muscle performance

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Duchenne muscular dystrophy (DMD), a progressive muscle degenerative disease associated with chronic inflammation, necrosis and fibrosis, is currently treated with antiinflammatory steroids, despite their limited efficacy and undesired side effects. Testicular Sertoli cells (SCs) have been successfully implanted to treat many experimental diseases due to their ability to secrete trophic, antiinflammatory and immunomodulatory molecules (Mital et al., 2010). We transplanted microencapsulated SCs, within highly biocompatible microcapsules (Luca et al., 2007) into the peritoneal cavity of *mdx* mice, an animal model of DMD. Three weeks after transplantation, skeletal muscles from SC-treated mice, compared with muscles from mock-treated mice, showed: i) dramatically reduced number of infiltrated cells, including (MAC3+) macrophages; ii) a marked decrease in necrotic myofibers, and an increased number of regenerated (normally sized and centrally nucleated) myofibers; and, iii) a significant decrease in fibrous tissue infiltration. Moreover, SC-treated, but not mock-treated *mdx* mice showed recovery of muscle performance in treadmill endurance tests and a comparable resistance to exercise-induced muscle damage to that of untreated wild-type mice. These preliminary results suggest that our transplant product creates a suitable microenvironment for muscle regeneration and growth potentially applicable to DMD patients.

References

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