EXPERIMENTAL ARTHRITIS

Dermal fibroblasts have MSC-like immunosuppressive effects *in vivo*

Following on from the findings of *in vitro* studies, new evidence indicates that dermal fibroblasts are capable of suppressing immune reactions *in vivo*, a function they share with mesenchymal stem cells (MSCs). Fibroblasts isolated from the skin of DBA1 mice behaved similarly to bone-marrow-derived MSCs in that they inhibited the progression of collagen-induced arthritis (CIA) when administered intravenously 18 and 24 days after immunization. Like MSCs, fibroblasts also delayed the onset and incidence of CIA.

Additional experiments demonstrated that the fibroblasts, which lacked the capacity to differentiate into other mesenchymal lineages, suppressed T-cell proliferation *in vitro* via secretion of nitric oxide, IL-6 and prostaglandin E₂—the same antiproliferative mediators by which MSCs exert their immunoregulatory functions.

Lymphocyte proliferation assays showed that *in vivo* treatment of CIA with either type of stromal cell was associated with suppression of the host inflammatory response and increased expression of anti-inflammatory cytokines—including IL-10—by splenic T cells. Similar immune responses were observed in T cells isolated from draining lymph nodes of MSC-treated and fibroblast-treated mice.

These immunomodulatory effects were not associated with the induction of CD25⁺FoxP3⁺ regulatory T cells. Rather, an increase in IL-10-secreting CD4⁺ T cells was observed following MSC treatment, suggesting a possible shift in the host immune response towards that of a type 2 T-helper cell response.

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Original article Bouffi, C. *et al.* Skin fibroblasts are potent suppressors of inflammation in experimental arthritis. *Ann. Rheum. Dis.* doi:10.1136/ard.2010.143297