# Mechanism ID'd for benefit of stem cells in autoimmunity

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Bone marrow mesenchymal stem cells activate a mechanism involving coupling of FAS/FAS ligand to induce T cell apoptosis and immune tolerance, according to an experimental study published online April 26 in *Cell Stem Cell*.

(HealthDay) -- Bone marrow mesenchymal stem cells (BMMSCs) activate a mechanism involving coupling of FAS/FAS ligand to induce T cell apoptosis and immune tolerance, according to an experimental study published online April 26 in *Cell Stem Cell*.

To investigate the mechanisms underlying the therapeutic benefit of BMMSCs in autoimmune disease, Kentaro Akiyama, D.D.S., Ph.D., from the University of Southern California in Los Angeles, and colleagues infused BMMSCs into mice.

The researchers found that, in mice models of systemic sclerosis or experimental colitis, infusion of BMMSCs induced T cell apoptosis via the FAS ligand-dependent FAS pathway, and reduced symptoms of the

disease. This was not seen in BMMSCs not expressing the FAS ligand. The apoptotic T cells triggered macrophages to produce transforming growth factor-β which upregulated $CD4^+CD25^+Foxp3^+$ regulatory T cells leading to immune tolerance. In five patients with systemic sclerosis who received a transplant of allogenic mesenchymal stem cells, disease symptoms improved and the FAS pathway was involved.

"These data therefore demonstrate a previously unrecognized mechanism underlying BMMSC-based immunotherapy involving coupling via FAS/FAS ligand to induce T cell apoptosis," Akiyama and colleagues conclude.

**More information:** doi 10.1016/j.stem.2012.03.007