

SIGNIFICANCE STATEMENT

Hematopoietic stem cell (HSC) chimerism produces tolerance to transplanted tissues; this has been achieved in highly mismatched kidney allograft recipients using FCRx, a bioengineered stem cell product that contains donor HSCs and unique facilitating cells. This study examined gene and miRNA expression for the first time in renal biopsies from tolerance-induced FCRx recipients, paired preimplantation donors, and subjects receiving standard immunosuppression. Although gene expression pathways associated with rejection were not upregulated in tolerant biopsies, these biopsies showed upregulation of genes involved in B cell receptor signaling, activation of anti-inflammatory pathways, and inhibition of proinflammatory regulators when compared with nonrejecting subjects on standard immunosuppression. Results support potential of this tolerance induction strategy (through active immunoregulation) to improve long-term kidney allograft survival.