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## Tumor Necrosis Factor Ligand-Receptor Superfamily and Arthritis

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### Abstract

The current studies of apoptosis in rheumatoid arthritis (RA) suggest that the TNF ligand-receptor superfamily (TNFRsF) molecules, downstream pathways (activation of pro-apoptosis or anti-apoptosis pathway), cell types (lymphocytes and synovial fibroblast), and the mechanism that triggers apoptosis (tolerance induction-related, downmodulation of inflammation-related, or DNA damage-related) all exhibit a capability to determine the induction or prevention of RA. This series of defects at different levels and in different cells have been shown to lead to T cell and synovial hyperproliferation, defective apoptosis, excessive apoptosis, or bone erosion. In this chapter, we summarize the available knowledge of the regulation of TNFRsF and their likely pathogenic roles in RA to help identify candidate target cells and target molecules for delivery of gene constructs to modulate apoptosis to prevent the development of RA in both humans and mice.

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The members of the TNF ligand-receptor superfamily (TNFRsF) are intimately involved in the regulation of the proliferation and death of immune cells and are of particular interest in relation to their role in the genesis of arthritis and autoimmune disease. The number of receptors, and their corresponding ligands that are recognized as members of the TNFRsF has increased rapidly, and the biological functions of these molecules are now being revealed (table 1). Many therapeutic strategies that target members of the TNFRsF, and their signaling pathways, have been proposed for the treatment of arthritis and autoimmune disease.