B7x: A novel, widely expressed B7 family member that inhibits T cell activation

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B7 family proteins provide costimulatory signals that regulate T cell responses. These signals can be either positive, as is the case of interactions of B7-1/2 with CD28 or B7h with ICOS, or inhibitory, as is the case for B7-1/2 with CTLA-4 or PD-L1/ 2 with PD-1. We have recently discovered the third set of B7 family-related T cell inhibitory molecules with the identification of a novel homologue of the B7 family, B7x. It is expressed in immune cells, non-lymphoid tissues and some tumor cell lines. B7x inhibits cell cycle progression, proliferation and cytokine production of both CD4+ and CD8+ T cells. B7x binds a receptor that is expressed on activated, but not resting T cells that is distinct from known CD28 family members. These studies identify a new costimulatory pathway that may have a unique function in downregulation of tissue-specific autoimmunity and anti-tumor responses.