

HIV-1 Vectors

Background

HIV-1 long terminal repeat (LTR) enhancer/promoter sequences are required for the replication of HIV in T cell lines. Previous studies have demonstrated that mutations in these regions alter HIV tropism. Efficient HIV RNA expression requires both the interaction of virally-encoded Tat protein with the TAR region of HIV RNA and the interaction of cellular transcription factors, such as Sp1 and NF-Kappa-B, with LTR DNA. Deletion of both the binding sites for Sp1 and NF-Kappa-B factors results in the loss of HIV-1 replicative ability, while alterations in the binding sites of one of the factors has variable effects on HIV-1 replication depending on the cell type and the level of the transcription factor. Thus, alterations in the binding sites of cellular transcription factors present in LTR region affect the range of cell types that HIV can infect. Thus, cytopathic viruses can be genetically altered to induce specificity.

The present invention describes the derivation of a genetically altered HIV-1 vector that can be used to selectively destroy tumor cells.

Description of the Technology

Scientists at UMDNJ have developed a genetically altered human immunodeficiency virus type 1 (HIV-1) vector that replicates only in human tumor cells, specifically, in CD4+ cells expressing Tax protein of Human T-cell Lymphotropic Virus Type I (HTLV-I). The HIV-1 LTR and enhancer sequences have been replaced by two copies of the HTLV-I LTR 21 base pair repeat Tax responsive element (TRE). The introduction of TRE into HIV-1 LTR imparts to the HIV-1 vector the ability to replicate in HTLV-1 expressing cells, such as HTLV-I+lymphoma cells (Adult T-cell lymphoma, ATL), or HTLV-I infected cells, such as chronic neurological disorder, but not in CD4+ cells lacking HTLV-I Tax. Genetically altered HIV-1 vectors, both replication competent and replication defective, encoding toxic products would be useful as cytotoxic agents for treating diseases caused by HTLV-1.

Additionally, this invention describes a method for killing HTLV-1 infected cells in humans with HTLV-1 disease using the genetically engineered human HIV-1 vector.

Applications

- As research tools
- Genetically altered HIV-1 encoding toxic products would be useful as cytotoxic agents for treating diseases caused by HTLV-1

Patent Status

- United States Patent granted on November 17, 1998
- Patent Number: 5,837,512

Licensing Opportunity

This technology is available for licensing non-exclusively.

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