LENTIVIRAL VECTORS BEARING IL-13 THAT TARGET HUMAN IL-13 RECEPTOR ALPHA-2-POSITIVE TUMOR CELLS

Technology Summary

The ability to selectively and efficiently target transgene delivery to specific cell types *in vitro* and *in vivo* remains a formidable challenge in gene therapy. Lentiviral (LV) vectors have emerged as powerful tools for basic research and clinical applications because of their ability to stably transduce both dividing and non-dividing cells. A wide range of viral envelope (Env) glycoproteins have the ability to associate with the membrane of LV vectors, a process that is referred to as pseudotyping. Pseudotyped vectors have the capacity to transduce specific cell types for specific applications.

The human interleukin-13 receptor α2 (IL-13Rα2) is an appealing target for cancer therapy because it is overexpressed in various types of tumors, including but not limited to glioblastoma, ovarian cancer, pancreatic cancer, prostate cancer, renal cell carcinoma, head and neck cancer, AIDS-Kaposi's sarcoma, and oral squamous cell carcinoma. **FDA researchers developed a collection of lentiviral vectors displaying human IL-13 and Measles virus (MV) H and F glycoproteins to target IL-13Rα2-expressing cells *in vitro* and *in vivo*.**

The following lentiviral vectors are available:

Env glycoprotein constructs: pCG-HcΔ18-AA-IL-13; pCG-HcΔ18-AA; pCG-FcΔ30; pCG-HcΔ18

Lentiviral vector plasmids: pSLIK-Neo/TRE Pitt-IL-13Rα2; pNL(CMV)EGFP/CMV/WPREΔU3; pNL(CMV)Fluc/CMV/WPREΔU3; pNL(CMV)GLuc/CMV/WPREΔU3; pNL(CMV)Luc2-Turbo RFP/CMV/WPREDU3

Potential Commercial Applications

- Lentiviral-based tumor receptor targeting strategies

Competitive Advantages

- Selective targeting of IL-13Rα2-positive tumor cells
- Can transduce actively dividing and non-dividing cells

Development Stage: Research Materials

Inventors: Jakob Reiser

Publications:

"Specific Targeting of Human Interleukin (IL)-13 Receptor α2-Positive Cells with Lentiviral Vectors Displaying IL-13" *Hum Gene Ther Methods.* 2012 Apr; 23(2): 137-147. PMID: 22612657

"A scalable method to concentrate lentiviral vectors pseudotyped with measles virus glycoproteins." *Gene Ther.* 2015 Mar; 22(3): 280-5. PMID: 25608718

"A patient-derived orthotopic xenograft model enabling human high-grade urothelial cell carcinoma of the bladder tumor implantation, growth, angiogenesis, and metastasis". *Oncotarget.* Aug; 24;9(66): 32718-32729. PMID: 30220977

Product Area: viral vector; vaccine development

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