

Description

LAIR1 (leukocyte-associated immunoglobulin-like receptor 1) Lentivirus are replication incompetent, HIV-based, VSV-G pseudotyped lentiviral particles ready to transduce nearly all types of mammalian cells, including primary and non-dividing cells. These particles contain human LAIR1 (NM_ 002287.6) driven by a CMV promoter and puromycin selection marker (Figure 1).

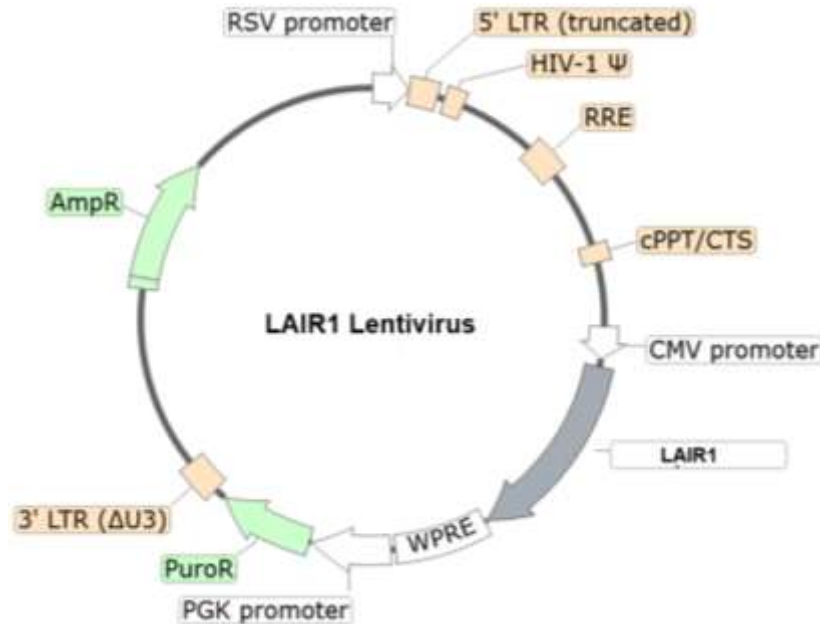


Figure 1. Schematic of the lenti-vector used to generate the LAIR1 Lentivirus.

Background

LAIR1, also known as leukocyte-associated immunoglobulin-like receptor 1 or CD305 (cluster of differentiation 305) is an inhibitory receptor present in NK (natural killer) cells, T and B cells. In NK cells it binds to SHP-1 (Src homology 2 domain-containing protein tyrosine phosphatase 1) and SHP-2 phosphatases, resulting in inhibition of NK-mediated cytotoxicity. LAIR1 contributes to CD8⁺ T- cell exhaustion in cancer, by binding to collagen and suppressing T cell activity via SHP-1. The increased expression of collagen and LAIR1 in lung cancer patients is linked to a poor prognosis. In addition, patients that develop resistance to PD-1 (programmed death 1) inhibitor treatment present LAIR1 expression. The use of inhibitors that prevent the binding of LAIR1 to its ligand has been shown to increase anti-tumor immunity. Further studies are needed to fully elucidate the role of LAIR1 in cancer and develop efficacious therapies targeting LAIR1 alone or in combination with PD-1 inhibitors.

Application(s)

- Expression of human LAIR1 in cells of interest.
- Generate cell pools or stable cell lines expressing human LAIR1 following puromycin selection.

Formulation

The lentivirus particles were produced in HEK293T cells in medium containing 90% DMEM + 10% FBS. Virus particles can be packaged in custom formulations by special request, for an additional fee.

Size and Titer

Two vials (500 µl x 2) of lentivirus at a titer $\geq 10^7$ TU/ml. The titer will vary with each lot; the exact value is provided with each shipment.

Storage

Lentiviruses are shipped with dry ice. For long-term storage, it is recommended to store the lentiviruses at -80°C. Avoid repeated freeze-thaw cycles. Titers can drop significantly with each freeze-thaw cycle.

Biosafety

The lentiviruses are produced with a SIN (self-inactivation) lentivector which ensures self-inactivation of the lentiviral construct after transduction and after integration into the genomic DNA of the target cells. None of the HIV genes (gag, pol, rev) will be expressed in the transduced cells, as they are expressed from packaging plasmids lacking the packing signal and are not present in the lentivirus particle. Although the pseudotyped lentiviruses are replication-incompetent, they require the use of a Biosafety Level 2 facility. BPS Bioscience recommends following all local federal, state, and institutional regulations and using all appropriate safety precautions.

Notes

To generate a LAIR1 stable cell line, remove the growth medium 48 hours after transduction and replace it with fresh growth medium containing the appropriate amount of puromycin (as pre-determined from a killing curve, <https://bpsbioscience.com/cell-line-faq>), for antibiotic selection of transduced cells, following by clonal selection.

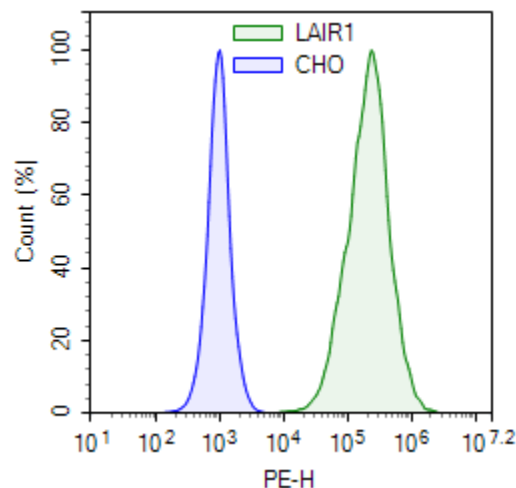
Figures and Validation Data

Figure 2. Expression of human LAIR1 in CHO cells transduced with LAIR1 lentiviruses.

The human LAIR1 CHO cell pool was generated by transduction of CHO-K1 cells with LAIR1 lentivirus, followed by puromycin selection. The expression of LAIR1 was analyzed by flow cytometry using human PE-conjugated Antibody (Thermo Fisher #12-3059-42).

Sequence

Human LAIR1 sequence (accession number NM_002287.6)

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MSPHPTALLGLVLCLAQTIHTQEEDLPRPSISAEPGTVIPLGSHVTFVCRGPVGVQTFRLERDSRSTYNDTEDVSQASPSESEARFRI
DSVREGNAGLYRCIYYKPPKWSEQSDYLELLVKESSGGPDSPTDEPGSSAGPTQRPSDNSHNEHAPASQGLKAEHLYLIGVSVVF
LFLLLLVFLCHRQNIKQGPGRSKDEEQKPPQRPDLAVDVLERTADKATVNGLPKDRDTSALAAGSSQEVTYAQLDHWAL
TQRTARAVSPQSTKPMAESITYAAVARH
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References

Meyaard L., *et al.*, 1997 *Immunity* 7(2): 283-90.

Aung T., *et al.*, 2023 *Cancer Res Commun.* 3(3): 471-482.

Troubleshooting Guide

Visit bpsbioscience.com/lentivirus-faq for detailed troubleshooting instructions. For further questions, please email support@bpsbioscience.com.

Related Products

<i>Products</i>	<i>Catalog #</i>	<i>Size</i>
LAIR1, Avi-His-Tag HiP™ Recombinant	79483	100 µg
CLEC2D, Fc Fusion (IgG1), Avi-Tag Recombinant	101186	100 µg/1 mg
NKp46 Lentivirus	78717	500 µl x 2
PD-1 CRISPR/Cas9 Lentivirus (Non-Integrating)	78052	500 µl x 2