

Description

CIITA (class II major histocompatibility complex transactivator) acts as a coactivator for MHC (major histocompatibility complex) class II-specific gene expression and negatively regulates the IL-4 gene promoter during T cell differentiation. IFN- γ (interferon-gamma) induces CIITA gene expression via JAK1 (Janus kinase 1) and Stat1 (Signal transducer and activator of transcription 1) pathways. The GTP-binding and acidic, proline-serine threonine-rich regions appear to be required for CIITA activity. Defects of CIITA has been implicated as causes of bare lymphocyte syndrome (BLS), which is characterized by the absence of MHC class II transcription and severe immunodeficiencies.

The CIITA CRISPR/Cas9 Lentiviruses are replication incompetent, HIV-based, VSV-G pseudotyped lentiviral particles that are ready to infect almost all types of mammalian cells, including primary and non-dividing cells. The particles contain a CRISPR/Cas9 gene driven by an EF1A promoter, along with 5 sgRNA (single guide RNAs) targeting human CIITA driven by a U6 promoter (Figures 1 and Table 1).

The integrating lentivirus integrates randomly into the cellular genome to express both Cas9 and the sgRNA. Puromycin selection forces high expression levels of both Cas9 and the sgRNA, and can be used with the integrating lentivirus to quickly and easily achieve high knockdown efficiencies in a cell pool. Efficiencies will depend on the cell type and the gene of interest.

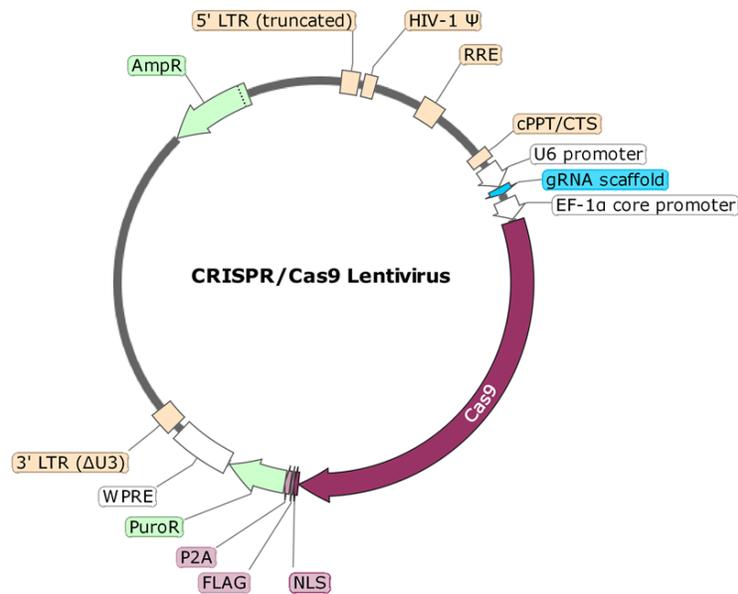


Figure 1: Schematic of the lenti-vector used to generate the CIITA CRISPR/Cas9 Lentivirus.

Gene Target:	sgRNA Sequence:
CIITA	GAGATTCAGGCAGCTCAACG
CIITA	CCATTGCTTGAACCGTCCGG
CIITA	ACATCAAAGTACCCTACAGG
CIITA	GGACAGCTCAAATAGGGCGT
CIITA	GATATTGGCATAAGCCTCCC

Table 1: List of sgRNA Sequences in the CIITA CRISPR/Cas9 Lentivirus.

Application(s)

- Transient knockdown of CIITA in target cells
- Generation of a stable CIITA knockout cell line following puromycin selection and limiting dilution

Formulation

The lentivirus particles were produced from HEK293T cells. They are supplied in cell culture medium containing 90% DMEM + 10% FBS.

Titer

Two vials (500 μ l x 2) of lentivirus at a titer $\geq 1 \times 10^7$ 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 the 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.

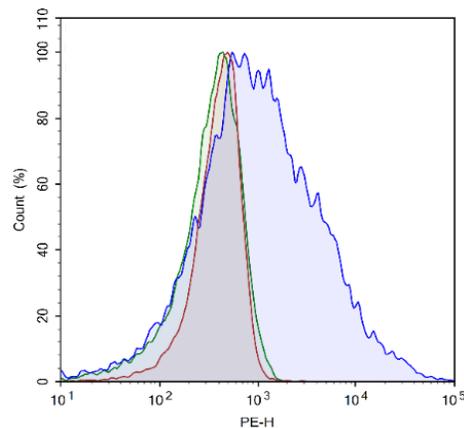
Figures and Validation Data

Figure 2: Knockdown of CIITA in THP-1 cells using CIITA CRISPR/Cas9 Lentivirus. 1×10^5 THP-1 cells were transduced via spinoculation with 1×10^7 TU of CIITA CRISPR/Cas9 lentivirus, corresponding to an MOI >100 . 48 hours after transduction, cells were stained with PE-labeled anti-human HLA-DR antibody (R&D Systems, #FAB4869P-100) and analyzed by flow cytometry. Unstained parental THP-1 cells (green) and non-transduced parental THP-1 cells (blue) were compared with transduced THP-1 cells (red). The Y-axis is the % cell number. The X-axis is the intensity of PE.

Troubleshooting Guide

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

License Disclosure

The CRISPR/CAS9 technology is covered under numerous patents, including U.S. Patent Nos. 8,697,359 and 8,771,945, as well as corresponding foreign patents applications, and patent rights.

Related Products

<i>Products</i>	<i>Catalog #</i>	<i>Size</i>
CIITA Knockout THP-1 Cell Line	78390	2 Vials
CIITA (Human) CRISPR/Cas9 Lentivirus (Non-Integrating)	78434	500 µl x 2
B2M/CIITA Double Knockout THP-1 Cell Line	78391	2 Vials
CTLA4 CRISPR/Cas9 Lentivirus (Non-Integrating)	78061	500 µl x 2
CTLA4 CRISPR/Cas9 Lentivirus (Integrating)	78054	500 µl x 2
TIGIT CRISPR/Cas9 Lentivirus (Non-Integrating)	78065	500 µl x 2
TIGIT CRISPR/Cas9 Lentivirus (Integrating)	78058	500 µl x 2
CD47 CRISPR/Cas9 Lentivirus (Non-Integrating)	78063	500 µl x 2
CD47 CRISPR/Cas9 Lentivirus (Integrating)	78056	500 µl x 2
PD-L1 CRISPR/Cas9 Lentivirus (Integrating)	78057	500 µl x 2
PD-L1 CRISPR/Cas9 Lentivirus (Non-Integrating)	78064	500 µl x 2
LAG3 CRISPR/Cas9 Lentivirus (Non-Integrating)	78060	500 µl x 2
LAG3 CRISPR/Cas9 Lentivirus (Integrating)	78053	500 µl x 2