



How to select the lentivirus products

Product Selection Guideline for GenTarget's lentivirus:

Lentivirus category	Promoter types	Antibiotic marker	Fluorescent marker	Lentivirus formats
Target expression;	suCMV;	Puromycin;	GFP;	Regular lentivirus in DMEM medium;
Fluorescent markers;	Optional Tet inducible promoter;	Blasticidin;	RFP;	Concentrated lentivirus in PBS;
Common enzymes;	EF1a promoter;	Neomycin;	CFP;	Ultra titer lentivirus in PBS;
Knockdown shRNA;	CAG promoter;	Hygromycin;	BFP;	
microRNA;	Tissue or Pathway specific promoter;	Or No any antibiotic marker	YFP;	
Anti miRNA			niRFP;	

For search GenTarget's target over-expression lentivirus:

You can search a product in the search field by input:

1. Search by **gene name**: for example, "**NR2E3**";
2. Search by gene **Alias names** or **gene_synonym** (alternative names): for example, "**PNR**";
3. Search by the gene's transcript **mRNA ID**, as NM_XXXXXX, for example, "**NM_014249**";

Or you simply open this [Product Manual](#) for all available over-expression lentivirus for human, mouse or rat' genes.

GenTarget provides all kinds of ready-to-use lentivirus products. Many cases, even for the same target, there are multiple products (many catalog numbers) to select. It seems a little confusion and hard to select which product to use. The following guidelines can help you narrow down the products for your need.



1. **Lentivirus category:**

First, you go for the lentivirus categories, or go for a specific target / marker. GenTarget provides lentivirus for **Fluorescent markers, enzyme, specific gene over-expression or knockdown-shRNA, microRNA, anti-miRNA and others**. Each type of lentivirus has a general product manual. In that manual, you may see multiple products with different features for the same target. For example, "[Luciferase product manual](#)" or "[Fluorescent protein manual](#)". Then, you select the product based upon each product features, listed below.

2. **Promoter:** suCMV, inducible CMV (tetCMV), EF1a, or CAG promoter.

GenTarget provide multiple products for the same target driven by different promoters, suCMV, tetCMV, EF1a, or CAG. You can pick the product driven by your desired promoter. In some products, the promoter can be a tissue specific, or pathway specific promoter.

The suCMV promoter is the strongest promoter in most cell types for the highest over-expression. The tetCMV promoter is an optional inducible promoter (it became the inducible promoter only when its repressor, tetR is present). The EF1a promoter was modified with less tissue, cell type specificity (also no promoter-silencing effects during long-term cell culture), thus is active in all cell types. The CAG promoter has strong activity in embryonic cells, some neuron and some types of stem cells. If you do not have promoter preference, simply pick the products with CMV or EF1a promoter.

3. **Selection marker:** **antibiotic marker** and **fluorescent marker**.

One important feature of lentivirus is that lentivirus provides long-term expression / knockdown because it integrates into cell's genome. To select the positive transduced cells, lentivirus often contains a fluorescent marker (for cell sorting) or /and an antibiotic marker (for killing selection).

GenTarget's products are made with different antibiotic selection marker, **Blasticidin (Bsd), Puromycin (Puro), Neomycin (Neo), Zeocin (Zeo), or Hygromycin (Hygro)**. Some products also contain a fluorescent marker, **GFP, RFP, BFP, CFP or YFP**, and sometime an luminance marker (**luciferase**).

Depend your preference with the selection marker, you pick the product containing your desired antibiotic marker, Bsd, or Puro or Neo or Hygro. If you need the product with a fluorescent marker as well, you pick the



product with both antibiotic marker and fluorescent marker as your desired.

Each antibiotic has different killing curve in each cell type, which have to be tested prior to the antibiotic selection. Puromycin and Blasticidin has the "fast killing feature" (often in about one week). Most cell types are extremely sensitive to puromycin. So, you select the product with the antibiotic marker good for your positive cell selection..

Each fluorescent marker has different wavelength (Ex and Em). The fluorescent maker provides an easy transduction efficiency check (under Fluorescent-microscope) or cell selection (via FACS sorting). You pick the product having your desired fluorescent marker. All fluorescent markers in GenTarget's products, are engineered with the strongest signal intensity.

4. **Lentivirus formats:**

GenTarget's lentivirus provides in three formats. You pick the virus depends on your application.

- 1) **Regular lentivirus:** provided in DMEM medium with 10% FBS and pre-added polybrene (10x). It satisfies most application. Simply add the virus into your cell culture.
- 2) **In vivo ready lentivirus:** provided in PBS solution with higher titer. It can be used for the cell types having low transduction efficiency (hard to infected cell types), or used for serum sensitive cell culture, like stem cell, or some primary cells.
- 3) **Ultra titer lentivirus:** concentrated virus with ultra high titer ($\geq 10^9$ IFU/ml) provided in PBS. It best fits for in vivo manipulation for direct injection, gene-therapy research and application that requires extreme high titer lentivirus.

Attachment: GenTarget's pre-made lentivirus product categories.

Product Category	Product Description (please click into each category's page)
Pathway Reporter	Repoter Lentivirus for all kinds of pathway screening assays
Cell Immortalization	Lentivirus for cell immortalization: Large T-antigen, hTERT, EBNA1/EBNA2, HpV16-E6/E7, Adenovial E1A,



Product Category	Product Description (please click into each category's page)
	Kras_G12V, HOXA9, et al.
ImmunoOncology Research	Lentivirus products for immuno therapy research: CAR and TCR; Assay Cell Lines for T-cell targeted killing assay and other cell-based assays; over-expression lentivirus products for the immune response targets; Cell surface antigens (CDs); immune checkpoint / Receptors; CRISPR gene Repair and knock-IN lentivirus; CRISPR knockout lentivirus;
CAR-T, TCR Lentivirus	CARs Lentivirus: Anti-CD19 /CD20 /CD22 /BCMA /hHER2 /HLA-A2 /TGFβ; TCRs : MART-1/ NY-ESO1/ CD1d-α-GalCer/ TRαV3-F2A-TRβV5-6;
CRISPR Gene Editing	Preamde lentivirus express humanized wild-type Cas9 endonuclease, the dCas9 , gRNAs, CRISPR gene editing research
Epigenomic: CRISPRi and CRISPRa	" dCas9-Protein " fusion Lentivirus for epigenomic modification, resulted in CRISPR interference (CRISPRi) or activation (CRISPRa).
Cell-Specific Reporter	a set of reporter lentiviruses to express a luminescence or fluorescent reporter (firefly Luciferase, Renilla luciferase, RFP or GFP fluorescent marker) under a tissue specific promoter
Infectious Antigens	Lentivirus that express all kinds of infectious antigens with C-term 6His-tag.
Virus Like Particles (VLP)	Lentiviral Like Particles, pseudo-typed with a different envelope proteins.
Non-integrating LV	Integration Defective Lentivirus, express different targets for transient expression without the unwanted insertional mutagenesis.
shRNA Knockdown	Knockdown verified and customized shRNA lentivirus for target knockdown,
microRNA lentivirus	Premade lentivirus expression human or mouse precursor miRNA . And anti-miRNA lentivector and virus for human and mouse miRNA.
Anti-miNA lentivirus	Pre-made lentivirus expression a specific anti-miRNA cassette.



Product Category	Product Description (please click into each category's page)
Human and mouse ORFs	Premade lentivirus expressing a human, mouse or rat gene with RFP-Blasticidin fusion dual markers.
Luciferase expression	Premade lentivirus for all kinds of luciferase protein expression: firefly and Renilla, Red-Luc and more , with different antibiotic selection markers.
Fluorescent Markers	Lentivirus express all commonly used fluorescent proteins: GFP, RFP, CFP, BFP YFP, niRFP, unstable GFP and others.
Luminescent Imaging	Lentivirus express Nano-Lantern as Bio-probes for in vivo imaging of sub-cellular structural organization and dynamic processes in living cells and organisms
Sub-cellular Imaging	Lentivirus contain a well-defined organelle targeting signal fused to a fluorescent protein, great tools for live-cell imaging and for dynamic investigation of sub-cellular signal pathways.
Cytoskeleton Imaging	A fluorescent marker (GFP, RFP or CFP) fusion with a cellular structure protein, provides a convenient tool for visualization of cytoskeletal structure
Unstable GFP	Lentivirus express the destabilized GFP (uGFP) which provides fast turnover responses in signal pathway assay and in knockdown / knockout detection
near-infrared RFP	The near-infrared Red fluorescent (niRFP) expression Lentiviruses provides the whole-body images with better contrast and brighter images
Fluorescent-ORF fusion	Pre-made lentivirus expression a " GFP/RFP/CFP-ORF " fusion target.
CRE recombinase	Premade lentivirus for expressing nuclear permeant CRE recombinase with different fluorescent and antibiotic markers.
CRE, Flp ColorSwitch	Lentivirus expressing "LoxP-GFP-Stop-LoxP-RFP" or "FRT-GFP-Stop-FRT-RFP" cassette, used to monitor the CRE or Flp recombination event in vivo.
SEAP Reporter	lentivirus expressing SEAP under different promoters (TetCMV, EF1a, CAG, Ubc, mPGK, Actin-beta or a signal pathway responsive promoter),
TetR Repressor	Premade lentivirus expressing TetR (tetracycline regulator) protein, the repressor protein for the inducible expression system.



Product Category	Product Description (please click into each category's page)
rtTA Expression	rtTA binds to the tetracycline operator element (TetO) in the presence of doxycycline (Dox). Used for Tet-On /OFF inducible system.
iPS factors	Premade lentivirus for human and mouse iPS (Myc, NANOG, OCT4, SOX2, FGF4) factors with different fluorescent and antibiotic markers
LacZ expression	Express different full length β-galactosidase (lacZ) with different selection markers
Negative control lentiviruses	Premade negative control lentivirus with different markers : serves as the negative control of lentivirus treatment, for validation of the specificity of any lentivirus target expression effects.
Other Enzyme expression	Ready-to-use lentivirus, expressing a specific enzymes with different selection markers.
Ultra titer lentivirus	Ultra-titer lentivirus used for the hard-to-transduced cells and for in vivo manipulation of sperm cells, or stem cells.