

Lenti-X™ Lentiviral Systems & Tools

Designed for High Titters

that's
GOOD
science!®



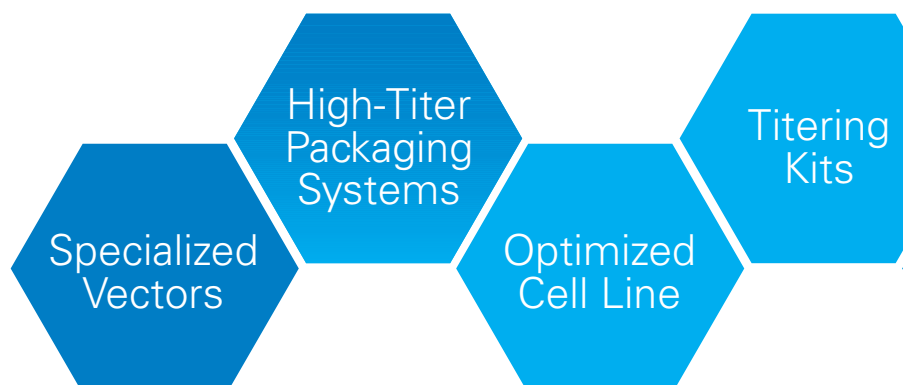
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Lenti-X Lentiviral Systems and Tools

Designed for high titers and high-efficiency transduction

Highlights

- Achieve very high titers of 10^7 – 10^8 infectious units (IFU) per ml
- Obtain highly infective VSV-G or ecotropic pseudo-typed lentivirus in 48 hr
- Infect an entire plate of target cells with as little as 10 μ l of viral supernatant
- Novel five-vector split-packaging technology ensures virus is safe



Surpasses competitor transduction efficiency by several orders of magnitude

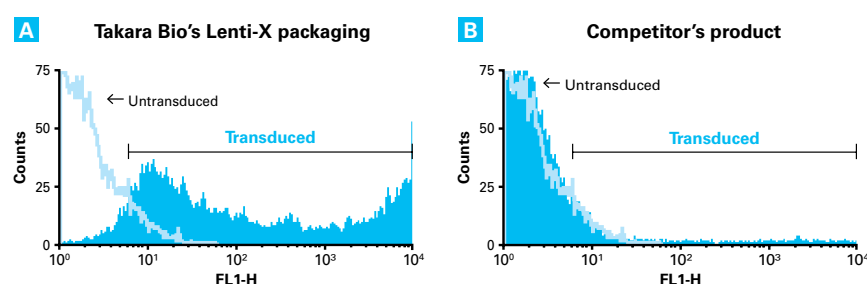


Figure 1. High infectivity of supernatants produced by Lenti-X Packaging System. Lenti-X (**Panel A**) and a packaging system from a competitor (**Panel B**) were each used to generate virus containing a vector system for expressing the ZsGreen1 fluorescent protein. 10 μ l of supernatant from each system was used to transduce HeLa cells. ZsGreen1-positive cells were quantified by flow cytometry. Lenti-X transduced the majority of cells, whereas the other system transduced only a small percentage of the cells.

Comprehensive and integrated product offering to meet your lentiviral transduction needs

Lenti-X lentiviral systems and tools from Takara Bio provide an industry-leading set of integrated tools for lentiviral transductions: from the Lenti-X Packaging Single Shots high-titer lentiviral packaging systems to an optimized cell line to accessory products that enhance or accelerate transduction efficiency.

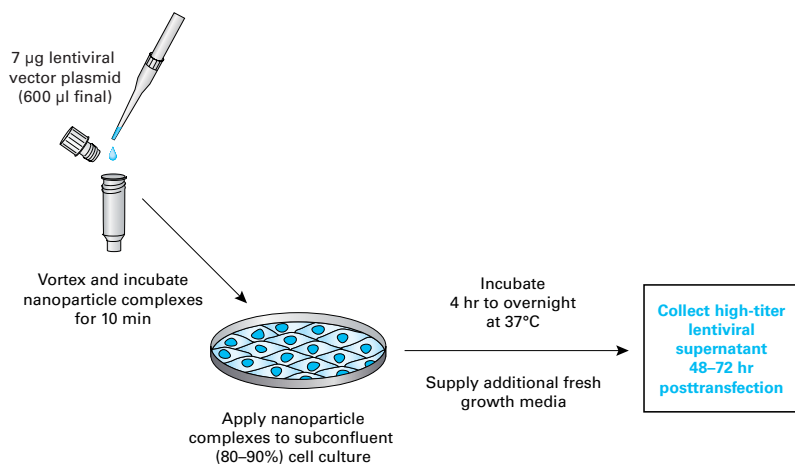
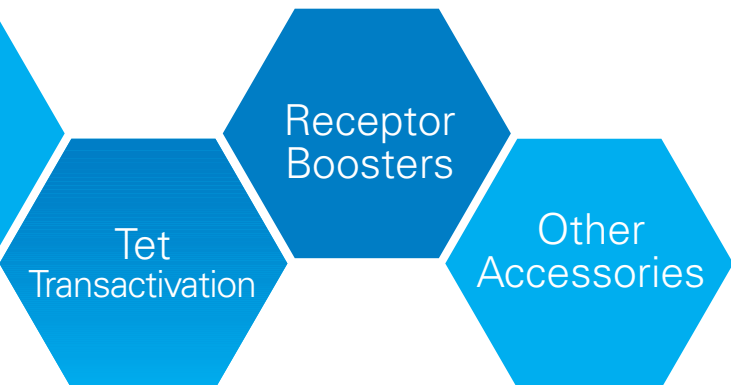


Figure 2. The Lenti-X Packaging Single Shots (VSV-G) protocol. The Lenti-X Single Shots use the 4th generation Lenti-X system optimized for high titer production in a convenient lyophilized format.

Key System Components

Optimized Lenti-X Vectors

Contain **cpPT/CTS** (central polypurine tract/central termination sequence) and **WPRE** (woodchuck hepatitis virus post-transcriptional regulatory element) that enhance transduction and gene expression.

Optimized Lenti-X Single Shots

Essential viral components on a proprietary suite of vectors, premixed in specific ratios to maximize virus production. The vectors are pre-aliquoted with transfection reagent in a convenient dry-down format. Simply reconstitute the mixture with your lentiviral vector in sterile water and add it to 293T cells.

Tetracycline Transactivation

High-level expression of key lentiviral packaging components is produced by **Tet-Off[®]** transactivation of tetracycline-responsive promoter elements (TREs).

Optimized Transfections

Nanoparticle-based **Xfect[™]** Transfection Reagent (*included*) transfects Lenti-X 293T Cells with over 95% efficiency.

Instant Titer Test

Determine the optimal harvest time for lentiviral supernatants in seconds with **Lenti-X GoStix[™]** (*three tests included*).

Specialized Lenti-X 293T Cell Line

Highly transfectable cells that yield lentiviral titers as high as 10^8 IFU/ml. (*Not included; sold separately*)

Ecotropic Receptor Boosters

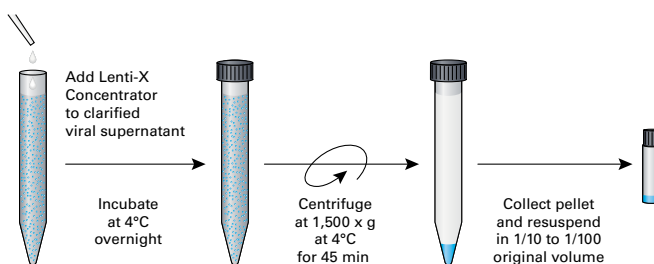
Allow you to increase the infection efficiency of any cell type, including human cells and cells that are resistant to viral infection.

Lenti-X Concentrator

Increase titer without ultracentrifugation

- Easy protocol—mix and spin
- Scalable to any volume or titer
- 100X concentration with 90% recovery

Add Lenti-X Concentrator reagent to clarified viral supernatant, incubate for 30 min to overnight at 4°C, and spin. It's that easy!

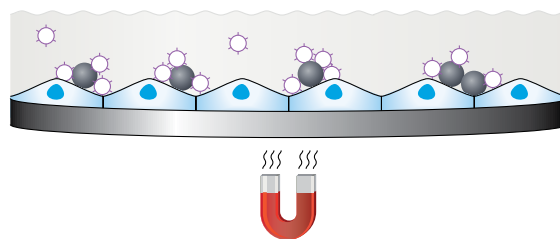


Lenti-X Accelerator

Fast and highly efficient transduction

- Magnetic bead-based—no polybrene
- For lentivirus & MMLV retrovirus
- Ideal for sensitive cell types (e.g. stem cells)
- Transduction time of 5 min

With the Lenti-X Accelerator, a magnetic field concentrates virus-bound magnetic beads at the cell monolayer surface. This reduces the exposure time of sensitive target cells to viral supernatant to just 5 min—compared to overnight transduction with polybrene. The Lenti-X Accelerator starter kit includes a magnetic plate.

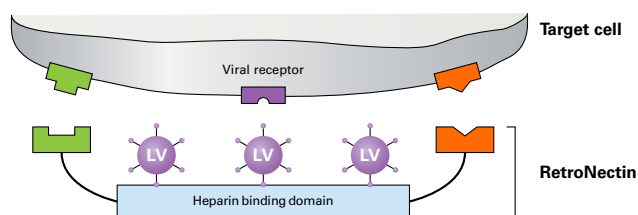


RetroNectin® Reagent

Transduction of hard-to-infect cell types

- Multivalent molecule simultaneously binds virus particles and cell surface proteins
- Widely used for hematopoietic cells and stem cells
- Increases transduction of hard-to-infect cells

Use RetroNectin-coated tissue culture plates to enhance lentivirus-mediated gene transduction into mammalian cells. The multivalent RetroNectin peptide allows for simultaneous binding of cells and lentivirus, bringing them into close physical proximity. The RGDS-containing domain (green) binds the cell surface integrin receptor VLA-5, the heparin-binding domain (blue) binds many types of virus particles, and the CS-1 sequence (orange) binds the VLA-4 cellular integrin receptor.

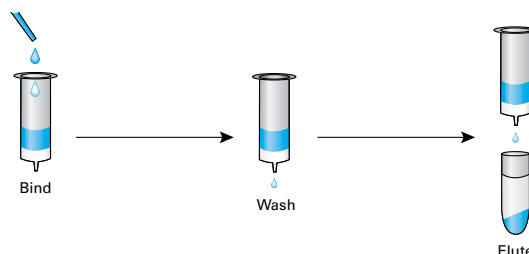


Lenti-X Maxi Purification Kit

High yield & purity

- Gentle gravity column-based protocol
- Does not damage lentiviral particles
- Results in better transduction efficiency
- Concentrates virus up to 10-fold

The Lenti-X gravity column-based method is extremely effective, and preserves virus much better than syringe filter-based methods. Just bind, wash, and elute.

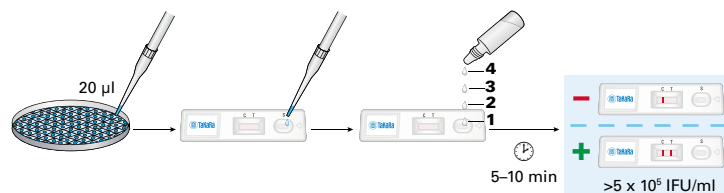


Lenti-X GoStix—Instant Lentiviral Titration

Get a YES or NO in only 10 minutes

- Distinguish between good and bad preps
- Know when to harvest lentiviral supernatants

Want to know if you have enough lentivirus? The Lenti-X GoStix protocol can tell you in 10 minutes. Simply apply 20 μ l of your lentiviral supernatant to the sample well, add 4 drops of buffer, and wait for the indicator bands to appear.

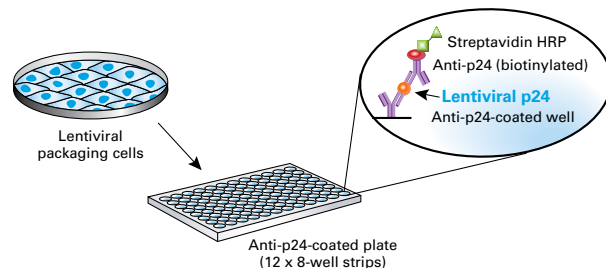


Lenti-X p24 Rapid Titer Kit

Rapid titer quantification

- Fast and easy ELISA-based titration protocol
- Collect supernatant, lyse, bind, wash, and detect
- Correlate p24 capsid protein content to viral titer

Lentiviral supernatant is bound to anti-p24 coated wells and detected using a combination of biotinylated anti-p24 secondary antibody, streptavidin-HRP, and a color reagent. Titration by provirus is also available.

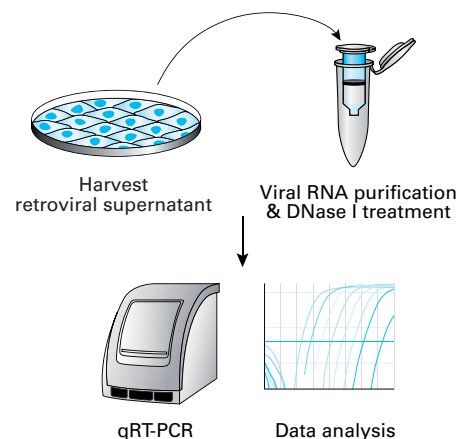


Lenti-X qRT-PCR Titration Kit

Accurate titration in 4 hr

- Fast and accurate titration using SYBR[®] Green chemistry
- Harvest, titer, and infect in a single day
- Obtain results in 4 hr

Set up your qRT-PCR reaction with purified RNA from harvested lentiviral supernatant. Determine the viral genome content from a calibrated RNA standard curve.

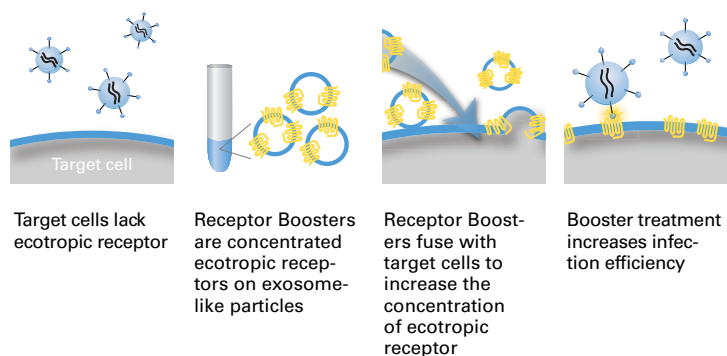


Ecotropic Receptor Boosters

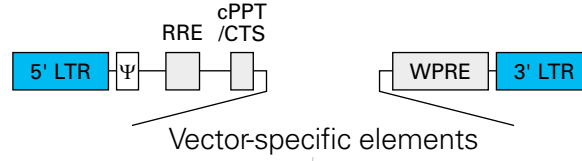
Transduce human cells with ecotropic virus

- Temporarily increase viral receptor density on your target cells
- Transduce more cell types, with equal efficiency

Our Ecotropic Receptor Booster consists of a vial of concentrated exosome-like vesicles that are densely coated with the mCAT-1 receptor protein. When the booster vesicles are applied to your cells, they fuse with the plasma membrane, resulting in an increased level of receptor proteins on the cell surface.



Core Lentiviral Vector Backbone



Constitutive cDNA Expression

Express your gene of interest from a strong CMV promoter, and select for lentiviral integration using antibiotic selection.

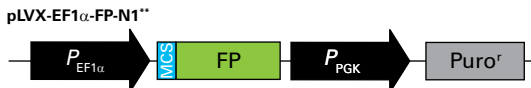


EF-1 Alpha Promoter

Express your gene of interest from an EF-1 alpha promoter in cell types where the CMV promoter can be silenced over time, such as hematopoietic or stem cells.



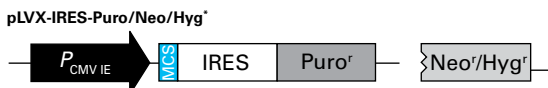
FP = fluorescent protein (mCherry or ZsGreen1)



FP = fluorescent protein (AcGFP1, DsRed-Monomer, or mCherry)

Bicistronic Expression

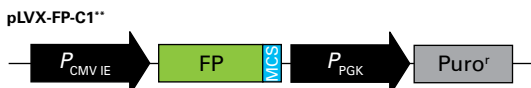
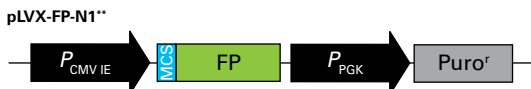
Coexpress your gene of interest and an antibiotic or fluorescent selectable marker from the same transcript using these IRES-containing lentiviral vector systems.



FP = fluorescent protein (mCherry, tdTomato, or ZsGreen1)

Fluorescent Protein Expression

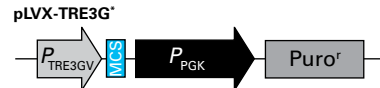
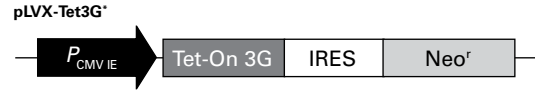
Clone your gene in-frame with one of Takara Bio's many fluorescent proteins (FP) and monitor the expression and subcellular localization of your protein of interest.



FP = fluorescent protein (AcGFP1, AmCyan1, DsRed-Express2, DsRed-Monomer, mCherry, tdTomato, or ZsGreen1)

Tetracycline-Inducible Expression

Tight control and high fold inducibility using the Tet-One™, Tet-On® 3G or Tet-Express™ vector systems.



ProteoTuner™ Protein Control

Clone your gene downstream of a ProteoTuner destabilization domain (DD) and control the stability of your protein with Shield1, a small molecule ligand, which protects the DD fusion protein from being degraded.



Promoter Reporters

Monitor the activity of your favorite promoter using a reporter system that expresses bright fluorescent proteins or secreted luciferase.



FP = fluorescent protein (AmCyan1, ZsGreen1, or tdTomato)

* Vectors available as part of an expression system.

** Vectors available separately.

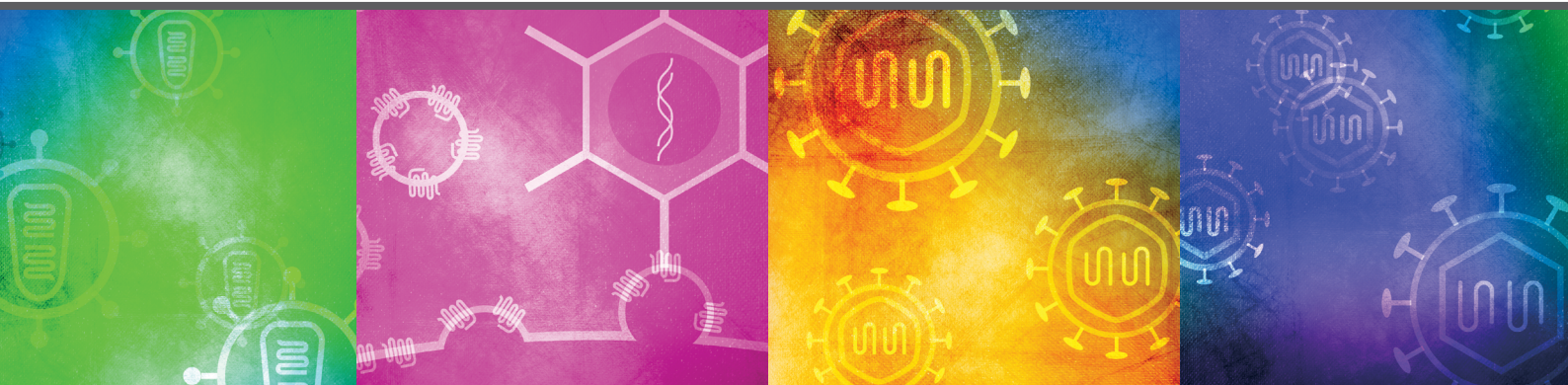
Cat. #	Product	Package Size
Lentiviral Packaging Systems		
631275	Lenti-X Packaging Single Shots (VSV-G)	16 rxns
631276		96 rxns
631277	Lenti-X Packaging Single Shots (Integrase Deficient)	16 rxns
631278	Lenti-X Packaging Single Shots (Ecotropic)	16 rxns
632180	Lenti-X 293T Cell Line	1 ml
Lentiviral Vector Systems (visit takarabio.com/lenti-X for a complete list of lentiviral vectors)		
632164*	Lenti-X Expression System	each
631253*	Lenti-X Expression System (EF1alpha version)	each
632182*	Lenti-X Bicistronic Expression System (Hyg)	each
632181*	Lenti-X Bicistronic Expression System (Neo)	each
632183*	Lenti-X Bicistronic Expression System (Puro)	each
631844	Lenti-X Tet-One Inducible Expression System	each
631847	Lenti-X Tet-One Inducible Expression System (Puro)	each
631187*	Lenti-X Tet-On 3G Inducible Expression System	each
631189*	Lenti-X Tet-Express Inducible Expression System	each
632154/(632155)	pLVX-AcGFP1-N1/(C1) Vector	10 µg
632558/(632557)	pLVX-AmCyan1-N1/(C1) Vector	10 µg
632560/(632559)	pLVX-DsRed-Express2-N1/(C1) Vector	10 µg
631983/(631984)	pLVX-EF1alpha-AcGFP1-N1/(C1) Vector	10 µg
631987	pLVX-EF1alpha-IRES-mCherry Vector	10 µg
631982	pLVX-EF1alpha-IRES-ZsGreen1 Vector	10 µg
631986/(631985)	pLVX-EF1alpha-mCherry-N1/(C1) Vector	10 µg
631237	pLVX-IRES-mCherry Vector	20 µg
631238	pLVX-IRES-tdTomato Vector	20 µg
632187	pLVX-IRES-ZsGreen1	10 µg
632562/(632561)	pLVX-mCherry-N1/(C1) Vector	10 µg
632563/(632564)	pLVX-tdTomato-N1/(C1) Vector	10 µg
632565/(632566)	pLVX-ZsGreen1-N1/(C1) Vector	10 µg
Lentiviral Transduction Tools		
631231	Lenti-X Concentrator	100 ml
631232		500 ml
631233	Lenti-X Maxi Purification Kit	2 preps
631234		5 preps
631245	Lenti-X Maxi Purification Kit (with Rack)	each
631235	Lenti-X qRT-PCR Titration Kit	200 rxns
631239	Lenti-X Provirus Quantitation Kit	200 rxns
631243	Lenti-X GoStix	20 tests
631244		50 tests
631254	Lenti-X Accelerator Starter Kit	each
631256	Lenti-X Accelerator	400 µl
631257		1,000 µl
631471	Ecotropic Receptor Booster	20 rxns
632200	Lenti-X p24 Rapid Titer Kit	96 rxns
T110A	RetroNectin Precoated Dish	10 dishes
T100A	RetroNectin Recombinant Human Fibronectin Fragment	0.5 mg
T100B		2.5 mg

Notes: C-terminal fusion vectors and associated Cat. Nos. are indicated in parenthesis.
Asterisk (*) marked Cat. Nos. include the Lenti-X Packaging Single Shots (VSV-G) (16 rxns).

Notice to Purchaser

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