

Retro-X™ Universal Packaging System

Transfect—Collect—Infect

- Obtain pseudotyped virus in 48 hours
- Consistently high titers
- Select preferred envelope protein according to your target cell

The **Retro-X Universal Packaging System** provides a rapid and convenient method for producing high titers of replication-incompetent retroviruses possessing the ideal host range required for your target cells. This Moloney Murine Leukemia Virus (MMLV)-based packaging system is ideal for testing multiple expression constructs and produces high titer, retroviral supernatants in only 48 hours.

The Efficiency of Retroviral Gene Transfer

Retroviral gene transfer systems depend on packaging cell lines to supply necessary viral structural proteins, and on retroviral expression vectors to supply the recombinant genetic material. Retroviral expression constructs are transfected into dedicated cell lines that package the recombinant viral RNAs into infectious, replication-incompetent particles (1, 2). Depending on the envelope proteins included in these retroviral particles, the viruses can be used to introduce an expression construct into virtually any dividing cell type. Following infection of target cells, the recombinant viral genome stably integrates into the host cell genome in a consistent manner, ensuring that each expression construct remains intact, functional, and heritable.

How the Universal Packaging System Works

The GP2-293 cell line included in the Retro-X Universal Packaging System contains the MMLV *gag* and *pol* genes stably integrated in its genome. These two proteins are necessary for viral replication and particle formation, and their stable expression in the GP2-293 cell line contributes to high viral titers (Figure 1). Excessive expression of these proteins has been shown to have a negative effect

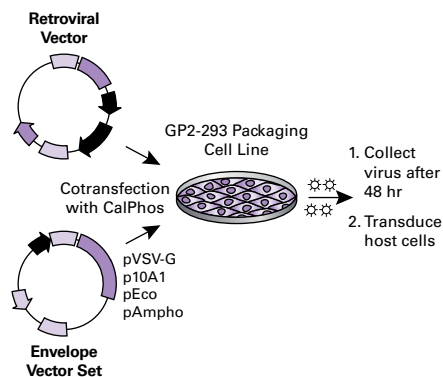


Figure 1. The Retro-X Universal Packaging System. The system consists of the GP2-293 Packaging Cell Line, which expresses viral Gag and Pol proteins, and a set of 4 viral *env* expression vectors. Cotransfecting an *env* vector with your retroviral construct allows you to select the ideal tropism for your virus.

on titers (3). The remaining component of the packaging process, a viral envelope gene, is supplied transiently and expressed to high levels when it is cotransfected with a user-supplied retroviral expression vector bearing the gene of interest. Clontech's **CalPhos Mammalian Transfection Kit** provides excellent transfection efficiencies for GP2-293 and other HEK 293-based cell lines. The cotransfected *env* gene encodes the viral envelope protein (Env) that determines the host range (tropism) of the virus, while high levels of Env help support the production of high titer supernatants.

Separate expression of these essential viral structural genes ensures safety and control over the recombinant constructs by minimizing the recombination opportunities that arise during cell division, reducing the chance of producing replication-competent virus (4, 5).

Select from Four Different *env* Expression Vectors

Viral envelopes are classified by the receptors they use to enter host cells. For example, ecotropic viruses recognize a receptor found only on mouse and rat cells. Amphotropic viruses recognize receptors found on a broad range of mammalian

Product	Size	Cat. No.	Price
Retro-X Universal Packaging System	each	631530	\$693.00
CalPhos Mammalian Transfection Kit	each	631312	\$184.00

Prices are subject to change without notice.

Retro-X Universal Packaging System Components

- GP2-293 Packaging Cell Line
- p10A1 Vector
- pAmpho Vector
- pEco Vector
- pVSV-G Vector
- pQCLIN Luciferase Control Vector

Related Products

- Retro-X™ Expression System (Cat. No. 631508)
- Pantropic Retroviral Expression System (Cat. No. 631512)
- MSCV Retroviral Expression System (Cat. No. 634401)

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Notice to Purchaser

Please see the CMV Sequence, IRES Sequence, Pantropic Retroviral Expression System, Retro-Q Vectors, and Retroviral Packaging Systems licensing statements at www.clontech.com/licensing

cell types. The kit includes a set of four *env* expression vectors that encode either ecotropic (gap70), amphotropic (4070A), dualtropic (10A1), or pantropic (VSV-G) envelope proteins. These vectors allow you to select the most appropriate envelope protein for your cells, and thus tailor the host range of the packaged virus to infect different cell lines. The Retro-X Universal Packaging System can be used with any MMLV-based vector containing the packaging sequence, including those in our Retroviral Expression Systems.

References

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