# pWZLneo-myr-Akt1 Retroviral Vector (Constitutively Active)

**CATALOG NUMBER:** RTV-125 **STORAGE:** -80ºC

**QUANTITY AND CONCENTRATION:** 100 µL of bacterial glycerol stock

## Background

Retroviruses are efficient tools for delivering heritable genes into the genome of dividing cells. Cell Biolabs' retrovirus vector is based on the pWZL vector system, which is derived from Moloney murine leukemia virus (MMLV). The vector provides the viral package signal, transcription and processing elements, and a target gene. The viral *env* gene, produced by the package cell line, encodes the envelop protein, which determines the viral infectivity range. Transfection into a package cell line produces high-titer, replication-incompetent viruses. In addition to transfer and expression of exogenous genes in mammalian cells, recently, retroviruses have been used to express silencing RNAs (siRNA) to decrease the expression of target genes both *in vitro* and *in vivo*.

The vector contains the bacterial origin of replication, ampicillin-resistance gene, and neomycin-resistance gene for the growth of infected mammalian cells to select stable cell lines (Figure 1).

The Akt /protein kinase B was identified as a serine/threonine protein kinase with high homology with the protein kinases A and C. At the same time, this kinase was identified as the cellular homologue of the viral oncoprotein v-Akt. Akts contain an N-terminal Pleckstrin homology domain, followed by a kinase domain and a C-terminal regulatory tail. Akt is an important regulator of various cellular processes including glucose metabolism, cell survival, and angiogenesis. The phosphoinositide 3-kinase and its product phosphoinositide-3,4,5-triphosphate can promote translocation of Akt to the plasma membrane and the phosphorylation at the two sites, Thr-308 and Ser-473. The activated Akt then phosphorylates substrates including glycogen synthase kinase-3, Bad, eNOS, caspase-9, and forkhead transcription factors. A constitutively active form of Akt, N-terminally myristoylation signal-attached Akt (myr-Akt), is cloned into the retroviral vector pWZLneo at the *Sna* BI site.

## Safety Consideration

Remember that you will be working with samples containing infectious virus. Follow the recommended NIH guidelines for all materials containing BSL-2 organisms. Always wear gloves, use filtered tips and work under a biosafety hood.

## References


1. Morgenstern, J. P. and H Land. (1990) *Nuc. Acid Res.* 18, 3587-3596.
2. Coffin, J. M. and H. E. Varmus, *Retroviruses*, Cold Spring Harbor Press, NY.
3. Schuck S, Manninen A, Honsho M, Fullekrug J and Simons K. (2004) *Proc Natl Acad Sci U S A.* 101, 4912-4917.
4. Datta, S. R., Brunet, A. and Greenberg, M. E. (1999) *Genes Dev.* 13, 2905–2927.

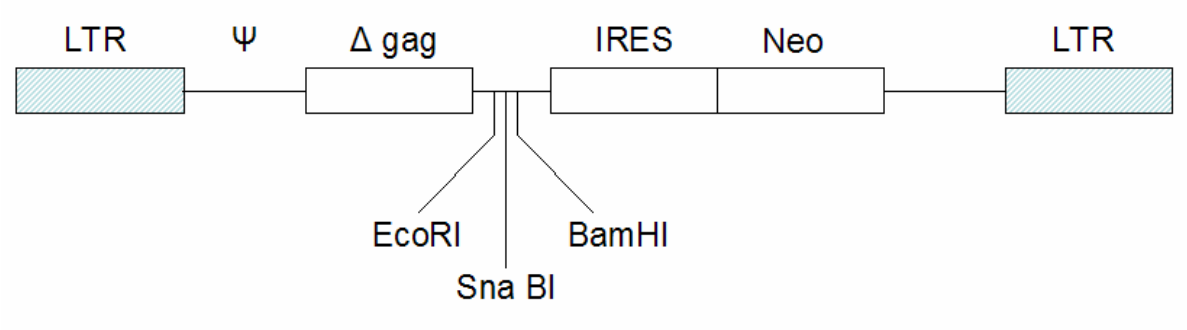


**Figure 1.** Schematic representation of pWZLneo retroviral vector

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