

## pBABEpuro-MAPKAPK2 Retroviral Vector (Constitutively Active)

CATALOG NUMBER: RTV-118

STORAGE: -80°C

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 pBABE 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 puromycin-resistance gene for the growth of infected mammalian cells to select stable cell lines (Figure 1).

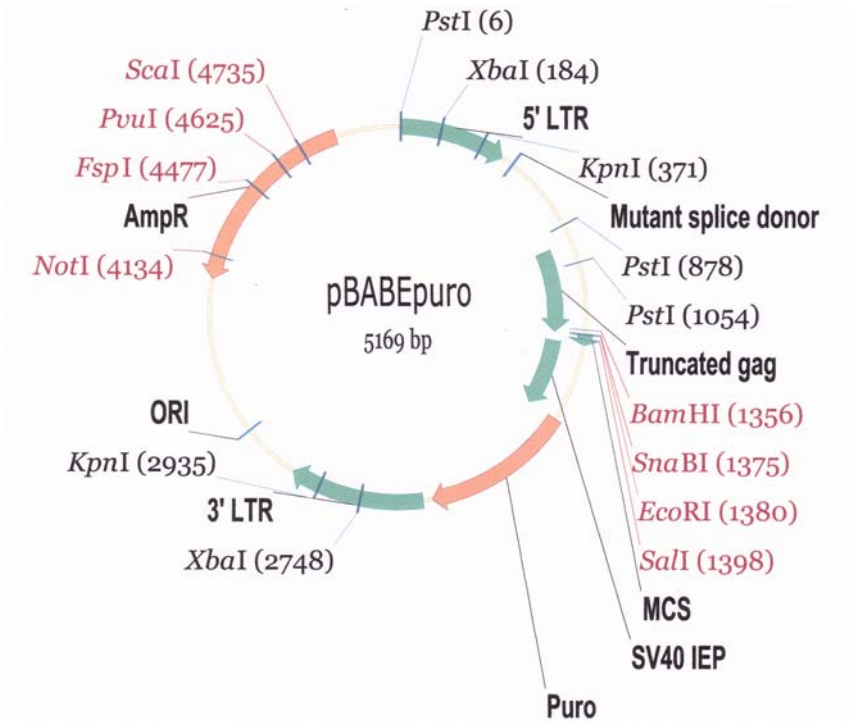
Mitogen-activated protein kinases (MAPK), including ERK1/2, p38, and JNK1/2, are important regulators of cell function. The ERK MAPKs are most frequently activated by mitogens, whereas the JNK and p38 MAPKs are strongly responsive to stress and inflammatory signals. The p38 MAPK family includes the p38 $\alpha$ ,  $\beta$ ,  $\delta$ , and  $\gamma$  isoforms. Once activated, p38 MAPK then phosphorylates, and may thereby activate, a number of substrates including two closely related downstream target kinases called mitogen-activated protein kinase-activated protein kinases-2 and -3 (MAPKAPK-2 and MAPKAPK-3). These MAPKAPKs, in turn, phosphorylate a set of substrates that include both the small heat shock protein HSP-27 and the nuclear transcription factor, cAMP-response element binding protein (CREB). A constitutively active form of murine MAPKAPK2 (E) is cloned into the retroviral vector pBABEpuro at the *Sna*B I site. The p38 phosphorylation site T222 has been changed to Glu.

### **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. Maizels E. T., Mukherjee A., Sithanandam G., Peters C. A., Cottom J., Mayo K. E. and Hunzicker-Dunn M. (2001) *Mol Endocrinol.* 15:716-33.



**Figure 1.** Retroviral Vector Map

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