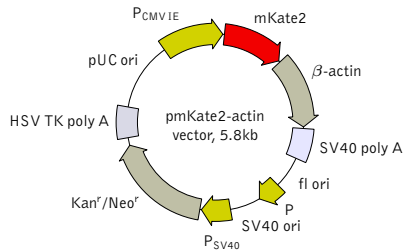


## pmKate2-actin vector

The vector sequence has been compiled using the information from sequence databases, published literature, and other sources, together with partial sequences obtained by Evrogen. This vector has not been completely sequenced.



For vector sequence, please visit our Web site at <http://www.evrogen.com/products/vectors.shtml>

### Location of features

P<sub>CMV IE</sub>: 1-589  
 Enhancer region: 59-465  
 TATA box: 554-560  
 Transcription start point: 583  
 Kozak consensus translation initiation site: 606-616  
 mKate2  
 Start codon (ATG): 613-615  
 Last amino acid in mKate2: 1306-1308  
 Beta-Actin: 1342-2469  
 Stop codon: 2467-2469  
 SV40 early mRNA polyadenylation signal  
 Polyadenylation signals: 2630-2635 & 2659-2664  
 mRNA 3' ends: 2668 & 2680  
 f1 single-strand DNA origin: 2727-3182  
 Bacterial promoter for expression of Kan<sup>r</sup> gene  
 -35 region: 3244-3249; -10 region: 3267-3272  
 Transcription start point: 3279  
 SV40 origin of replication: 3523-3658  
 SV40 early promoter  
 Enhancer (72-bp tandem repeats): 3356-3427 & 3428-3499  
 21-bp repeats: 3503-3523, 3524-3544 & 3546-3566  
 Early promoter element: 3579-3585  
 Major transcription start points: 3575, 3613, 3619 & 3624  
 Kanamycin/neomycin resistance gene  
 Neomycin phosphotransferase coding sequences:  
 Start codon (ATG): 3707-3709; Stop codon: 4499-4501  
 G->A mutation to remove Pst I site: 3889  
 C->A (Arg to Ser) mutation to remove BssH II site: 4235  
 Herpes simplex virus (HSV) thymidine kinase (TK) polyadenylation signal  
 Polyadenylation signals: 4737-4742 & 4750-4755  
 pUC plasmid replication origin: 5086-5729

Product	Cat.#	Size
pmKate2-actin vector	<b>FP184</b>	20 μg
Vector type	mammalian expression vector	
Reporter	mKate2	
Reporter codon usage	mammalian	
Promoter for mKate2	P <sub>CMV IE</sub>	
Host cells	mammalian	
Selection	prokaryotic - kanamycin eukaryotic - neomycin (G418)	
Replication	prokaryotic - pUC ori eukaryotic - SV40 ori	
Use	far-red fluorescent labeling of β-actin filaments	

### Vector description

pmKate2-actin is a mammalian expression vector encoding mKate2-actin fusion protein. The vector can be used for fluorescent labeling of β-actin in living cells.

mKate2 codon usage is optimized for high expression in mammalian cells (humanized) [Haas et al. 1996]. Human cytoplasmic β-actin is fused to the mKate2 C-terminus. To increase mRNA translation efficiency, Kozak consensus translation initiation site is generated upstream of the mKate2-actin coding sequence [Kozak 1987].

pmKate2-actin vector can be used as a source of mKate2-actin hybrid sequence. The vector backbone contains unique restriction sites that permit its excision and further insertion into expression vector of choice.

**Note:** The plasmid DNA was isolated from dam<sup>+</sup>-methylated *E. coli*. Therefore some restriction sites are blocked by methylation. If you wish to digest the vector using such sites you will need to transform the vector into a dam<sup>-</sup> host and make fresh DNA.

The vector backbone contains immediate early promoter of cytomegalovirus (P<sub>CMV IE</sub>) for protein expression, SV40 origin for replication in mammalian cells expressing SV40 T-antigen, pUC origin of replication for propagation in *E. coli*, and f1 origin for single-stranded DNA production. SV40 polyadenylation signals (SV40 poly A) direct proper processing of the 3'-end of the reporter mRNA.

SV40 early promoter (P<sub>SV40</sub>) provides neomycin resistance gene (Neo<sup>r</sup>) expression to select stably transfected eukaryotic cells using G418. Bacterial promoter (P) provides kanamycin resistance gene expression (Kan<sup>r</sup>) in *E. coli*. Kan<sup>r</sup>/Neo<sup>r</sup> gene is linked with herpes simplex virus (HSV) thymidine kinase (TK) polyadenylation signals.

### Expression in mammalian cells

pmKate2-actin vector can be transfected into mammalian cells by any known transfection method. CMV promoter provides strong, constitutive expression of the mKate2-actin fusion in eukaryotic cells. If required, stable transformants can be selected using G418 [Gorman 1985].

### Propagation in *E. coli*

Suitable host strains for propagation in *E. coli* include DH5alpha, HB101, XL1-Blue, and other general purpose strains. Plasmid incompatibility group is pMB1/ColE1. The vector confers resistance to kanamycin (30 μg/ml) to *E. coli* hosts. Copy number in *E. coli* is about 500.

### References

- Gorman, C. (1985). "High efficiency gene transfer into mammalian cells." In: *DNA cloning: A Practical Approach, Vol. II*. Ed. by Glover. (IRL Press, Oxford, U.K.) Pp. 143-190.
- Haas, J. et al. (1996) "Codon usage limitation in the expression of HIV-1 envelope glycoprotein." *Curr Biol*, 6 (3): 315-324 / pmid: 8805248
- Kozak, M. (1987) "An analysis of 5'-noncoding sequences from 699 vertebrate messenger RNAs." *Nucleic Acids Res*, 15 (20): 8125-8148 / pmid: 3313277

### Notice to Purchaser:

mKate2-related materials (also referred to as "Products") are intended for research use only. The Products are covered by U.S. Pat. 7,638,615; European Pat. 1994149; and other Evrogen Patents and/or Patent applications pending. By use of these Products, you accept the terms and conditions of the applicable Limited Use Label License #001: <http://www.evrogen.com/products/Evrogen-FP-license.shtml>.

The CMV promoter is covered under U.S. Patents 5,168,062 and 5,385,839, and its use is permitted for research purposes only. Any other use of the CMV promoter requires a license from the University of Iowa Research Foundation, 214 Technology Innovation Center, Iowa City, IA 52242.

**MSDS information** is available at <http://www.evrogen.com/MSDS.shtml>