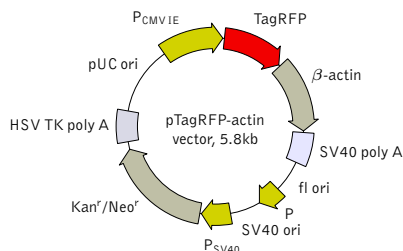


pTagRFP-actin vector

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_{CMV IE}: 1-589
 Enhancer region: 59-465
 TATA box: 554-560
 Transcription start point: 583
 Kozak consensus translation initiation site: 606-616
 TagRFP
 Start codon (ATG): 613-615
 Last amino acid in TagRFP: 1321-1323
 Beta-Actin: 1345-2472
 Stop codon: 2470-2472
 SV40 early mRNA polyadenylation signal
 Polyadenylation signals: 2633-2638 & 2662-2667
 mRNA 3' ends: 2671 & 2683
 f1 single-strand DNA origin: 2730-3185
 Eukaryotic promoter for expression of Kan^r gene
 -35 region: 3247-3252; -10 region: 3270-3275
 Transcription start point: 3282
 SV40 origin of replication: 3526-3661
 SV40 early promoter
 Enhancer (72-bp tandem repeats): 3359-3430 & 3431-3502
 21-bp repeats: 3506-3526, 3527-3547 & 3549-3569
 Early promoter element: 3582-3588
 Major transcription start points: 3578, 3616, 3622 & 3627
 Kanamycin/neomycin resistance gene
 Neomycin phosphotransferase coding sequences:
 Start codon (ATG): 3710-3712; Stop codon: 4502-4504
 G->A mutation to remove Pst I site: 3892
 C->A (Arg to Ser) mutation to remove BssH II site: 4238
 Herpes simplex virus (HSV) thymidine kinase (TK) polyadenylation signal
 Polyadenylation signals: 4740-4745 & 4753-4758
 pUC plasmid replication origin: 5089-5732

Product	Cat.#	Size
pTagRFP-actin vector	FP144	20 μg
Vector type	mammalian expression vector	
Reporter	TagRFP	
Reporter codon usage	mammalian	
Promoter for TagRFP	P _{CMV IE}	
Host cells	mammalian	
Selection	prokaryotic - kanamycin eukaryotic - neomycin (G418)	
Replication	prokaryotic - pUC ori eukaryotic - SV40 ori	
Use	red (orange) fluorescent labeling of β-actin filaments	

Vector description

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

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

pTagRFP-actin vector can be used as a source of TagRFP-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⁺-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⁻ host and make fresh DNA.

The vector backbone contains immediate early promoter of cytomegalovirus (P_{CMV IE}) 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_{SV40}) provides neomycin resistance gene (Neo^r) expression to select stably transfected eukaryotic cells using G418. Bacterial promoter (P) provides kanamycin resistance gene expression (Kan^r) in *E. coli*. Kan^r/Neo^r gene is linked with herpes simplex virus (HSV) thymidine kinase (TK) polyadenylation signals.

Expression in mammalian cells

pTagRFP-actin vector can be transfected into mammalian cells by any known transfection method. CMV promoter provides strong, constitutive expression of the TagRFP-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

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