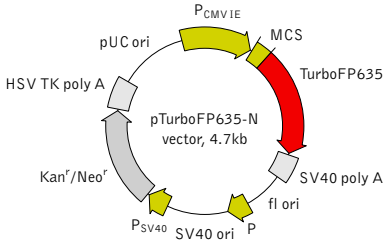
pTurboFP635-N vector

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.

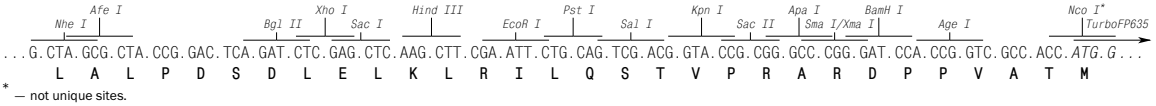


For vector sequence, please visit our Web site at http://www.evrogen.com/products/vectors.shtml

Product	Cat.#	Size
pTurboFP635-N vector	**FP722**	20 μg

Vector type	mammalian expression vector
Reporter	TurboFP635
Reporter codon usage	mammalian
Promoter for TurboFP635	$P_{CMV\ IE}$
Host cells	mammalian
Selection	prokaryotic - kanamycin eukaryotic - neomycin (G418)
Replication	prokaryotic - pUC ori eukaryotic - SV40 ori
Use	TurboFP635 expression in mammalian cells; generation of fusions to the TurboFP635 N-terminus

Multiple cloning site (MCS)



* — not unique sites.

Location of features

$P_{CMV\ IE}$: 1-589
Enhancer region: 59-465
TATA box: 554-560
Transcription start point: 583
MCS: 591-671
TurboFP635
Kozak consensus translation initiation site: 672-682
Start codon (ATG): 679-681; Stop codon: 1384-1386
SV40 early mRNA polyadenylation signal
Polyadenylation signals: 1540-1545 & 1569-1574
mRNA 3' ends: 1578 & 1590
f1 single-strand DNA origin: 1637-2092
Bacterial promoter for expression of Kan^r gene
-35 region: 2154-2159; -10 region: 2177-2182
Transcription start point: 2189
SV40 origin of replication: 2433-2568
SV40 early promoter
Enhancer (72-bp tandem repeats): 2266-2337 & 2338-2409
21-bp repeats: 2413-2433, 2434-2454 & 2456-2476
Early promoter element: 2489-2495
Major transcription start points: 2485, 2523, 2529 & 2534
Kanamycin/neomycin resistance gene
Neomycin phosphotransferase coding sequences:
Start codon (ATG): 2617-2619; Stop codon: 3409-3411
G->A mutation to remove Pst I site: 2799
C->A (Arg to Ser) mutation to remove BssH II site: 3145
Herpes simplex virus (HSV) thymidine kinase (TK) polyadenylation signal
Polyadenylation signals: 3647-3652 & 3660-3665
pUC plasmid replication origin: 3996-4639

Vector description

pTurboFP635-N is a mammalian expression vector encoding far-red fluorescent protein TurboFP635. The vector allows generation of fusions to the TurboFP635 N-terminus and expression of TurboFP635 fusions or TurboFP635 alone in eukaryotic (mammalian) cells.

TurboFP635 codon usage is optimized for high expression in mammalian cells (humanized) [Haas et al. 1996]. To increase mRNA translation efficiency, Kozak consensus translation initiation site is generated upstream of the TurboFP635 coding sequence [Kozak 1987]. Multiple cloning site (MCS) is located between $P_{CMV\ IE}$ and TurboFP635 coding sequence.

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.

Generation of TurboFP635 fusion proteins

A localization signal or a gene of interest can be cloned into MCS of the vector. It will be expressed as a fusion to the TurboFP635 N-terminus when inserted in the same reading frame as TurboFP635 and no in-frame stop codons are present. The inserted sequence should contain an initiating ATG codon. TurboFP635-tagged fusions retain fluorescent properties of the native protein allowing fusion localization *in vivo*. Unmodified vector will express TurboFP635 when transfected into eukaryotic (mammalian) cells.

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.

Expression in mammalian cells

pTurboFP635-N vector can be transfected into mammalian cells by any known transfection method. CMV promoter provides strong, constitutive expression of TurboFP635 or its fusions 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