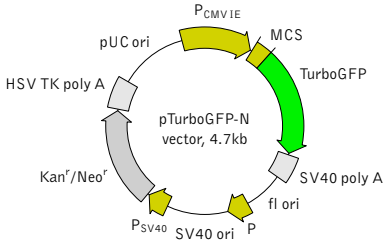
pTurboGFP-N vector

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.

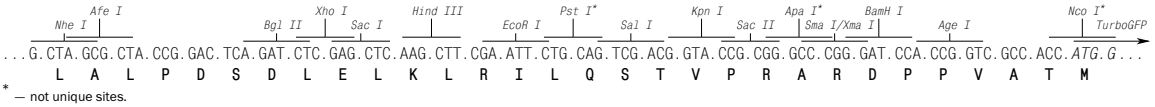


For vector sequence, please visit our Web site at http://www.evrogen.com/products/vectors.shtml

Product	Cat.#	Size
pTurboGFP-N vector	**FP512**	20 μg

Vector type	mammalian expression vector
Reporter	TurboGFP
Reporter codon usage	mammalian
Promoter for TurboGFP	$P_{CMV\ IE}$
Host cells	mammalian
Selection	prokaryotic - kanamycin eukaryotic - neomycin (G418)
Replication	prokaryotic - pUC ori eukaryotic - SV40 ori
Use	TurboGFP expression in mammalian cells; generation of fusions to the TurboGFP 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
TurboGFP
Kozak consensus translation initiation site: 672-682
Start codon (ATG): 679-681; Stop codon: 1375-1377
SV40 early mRNA polyadenylation signal
Polyadenylation signals: 1531-1536 & 1560-1565
mRNA 3' ends: 1569 & 1581
f1 single-strand DNA origin: 1628-2083
Eukaryotic promoter for expression of Kan^r gene
-35 region: 2145-2150; -10 region: 2168-2173
Transcription start point: 2180
SV40 origin of replication: 2424-2559
SV40 early promoter
Enhancer (72-bp tandem repeats): 2257-2328 & 2329-2400
21-bp repeats: 2404-2424, 2425-2445 & 2447-2467
Early promoter element: 2480-2486
Major transcription start points: 2476, 2514, 2520 & 2525
Kanamycin/neomycin resistance gene
Neomycin phosphotransferase coding sequences:
Start codon (ATG): 2608-2610; Stop codon: 3400-3402
G->A mutation to remove Pst I site: 2790
C->A (Arg to Ser) mutation to remove BssH II site: 3136
Herpes simplex virus (HSV) thymidine kinase (TK) polyadenylation signal
Polyadenylation signals: 3638-3643 & 3651-3656
pUC plasmid replication origin: 3987-4630

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

Vector description

pTurboGFP-N is a mammalian expression vector encoding green fluorescent protein TurboGFP. The vector allows generation of fusions to the TurboGFP N-terminus and expression of TurboGFP fusions or TurboGFP alone in eukaryotic (mammalian) cells.
TurboGFP 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 TurboGFP coding sequence [Kozak 1987]. Multiple cloning site (MCS) is located between $P_{CMV\ IE}$ and TurboGFP 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 TurboGFP 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 TurboGFP N-terminus when inserted in the same reading frame as TurboGFP and no in-frame stop codons are present. The inserted sequence should contain an initiating ATG codon. TurboGFP-tagged fusions retain fluorescent properties of the native protein allowing fusion localization *in vivo*. Unmodified vector will express TurboGFP 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

pTurboGFP-N vector can be transfected into mammalian cells by any known transfection method. CMV promoter provides strong, constitutive expression of TurboGFP 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.