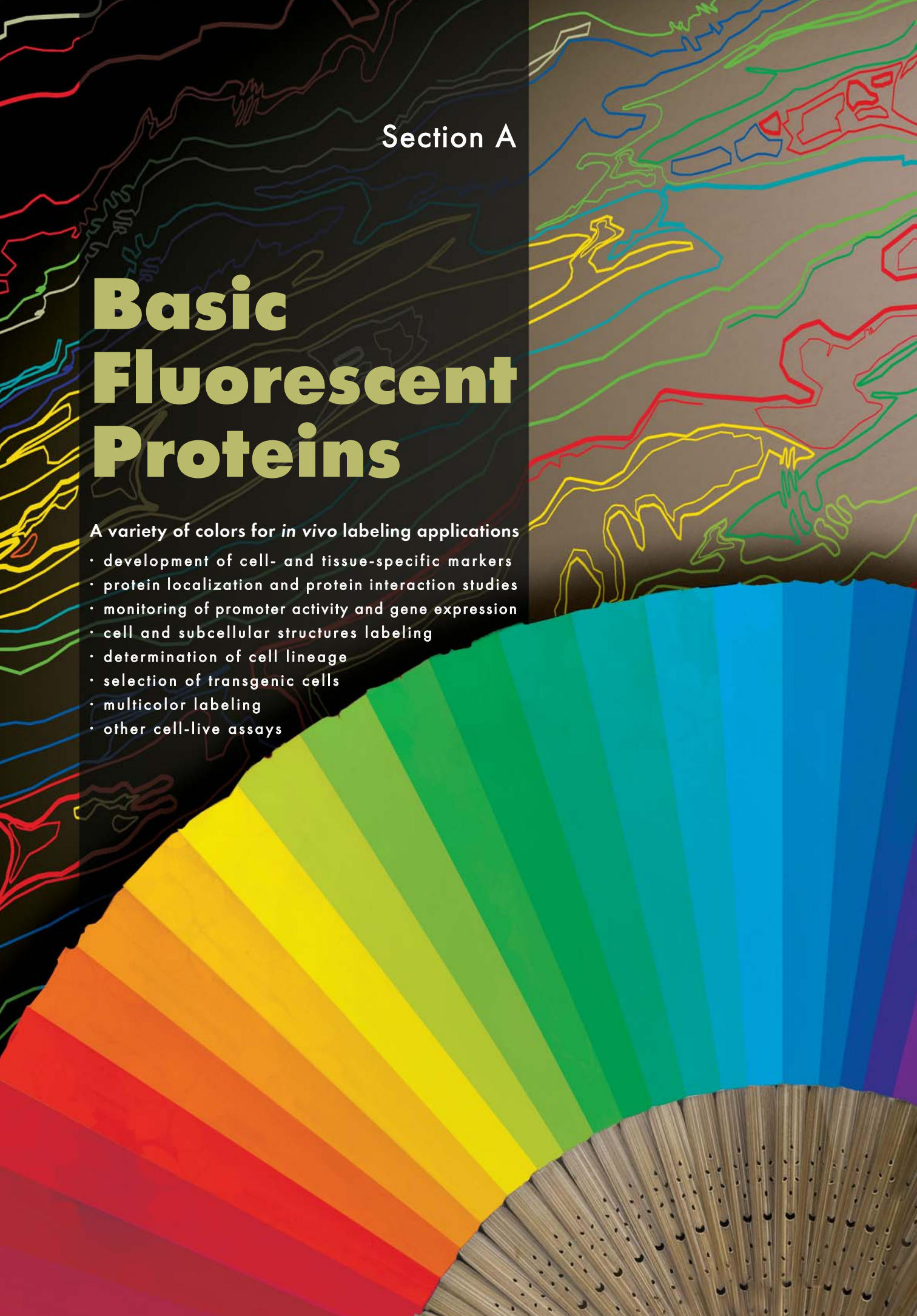
Section A

Basic Fluorescent Proteins



A variety of colors for *in vivo* labeling applications

- development of cell- and tissue-specific markers
- protein localization and protein interaction studies
- monitoring of promoter activity and gene expression
- cell and subcellular structures labeling
- determination of cell lineage
- selection of transgenic cells
- multicolor labeling
- other cell-live assays

Section content

Overview

Evrogen offers a wide collection of bright fluorescent proteins for common applications in the field of live-cell assays (labeling of cells, subcellular structures, and proteins; analysis of promoter activity; generation of stably transfected cell lines expressing fluorescent proteins or their fusions; etc).

Ranging in color from cyan to far-red, Evrogen fluorescent proteins can be used for multicolor labeling to observe different cellular events in a particular cell or a cell population.

Advantages

- Wide spectral diversity
- Easy detection by flow cytometry or fluorescence microscopy
- No cofactors, substrate addition, or chemical staining required
- Suitability for stable expression
- Suitability for multicolor labeling
- Special optimization for different applications
- Broad product line: various expression vectors, recombinant proteins, antibodies. Third party stably transfected cell lines are available.
- Free evaluation period during the first six months after purchase for For-Profit entities

Evrogen basic fluorescent proteins are divided into subgroups according to their properties and recommended applications:

TagFPs

Monomeric proteins of different colors, ideal for protein labeling.

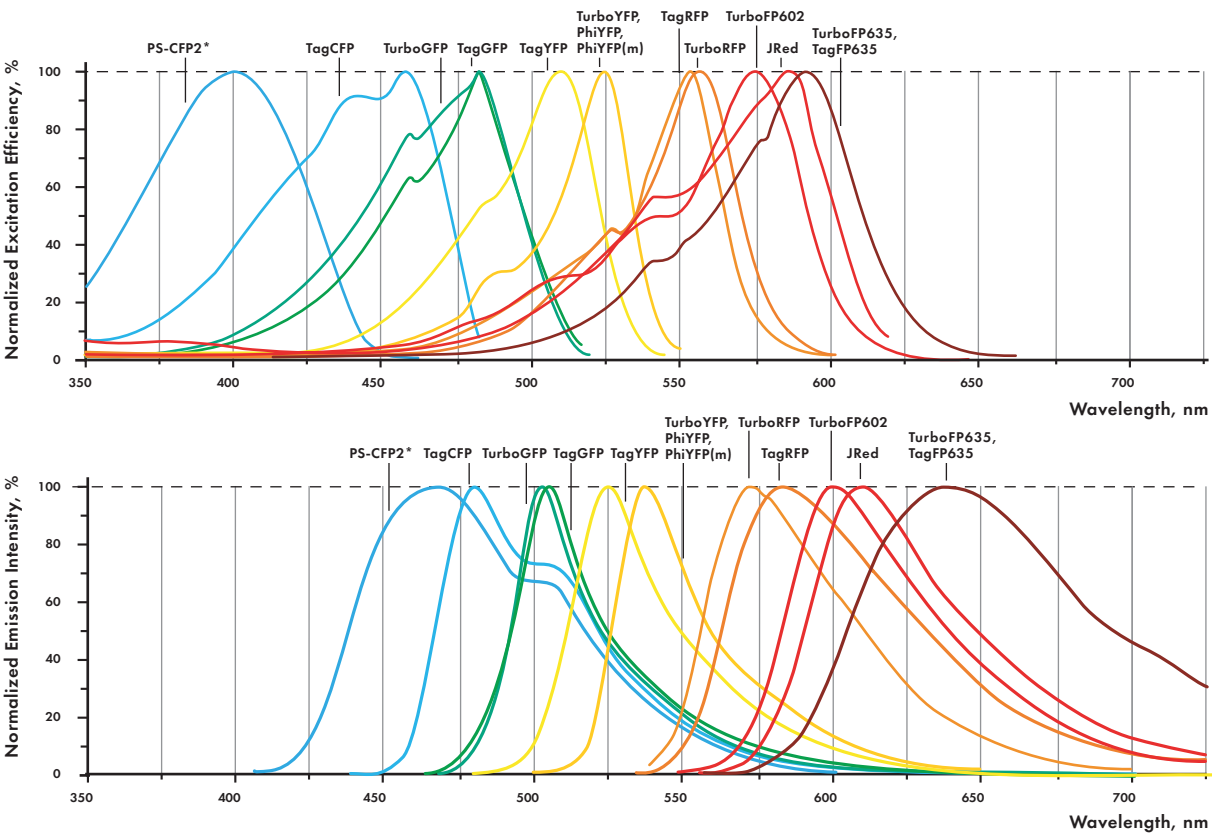
TurboColors

Super-bright and fast-maturing proteins of different colors for cell labeling and monitoring of promoter activity.

Other Basic FPs

Proteins for various common applications.

Basic fluorescent proteins, excitation/emission spectra



* PS-CFP2 is a photoswitchable fluorescent protein (page B-5), however it can be used as a routine cyan fluorescent tag for protein labeling and FRET applications at moderate excitation intensities.

Evrogen basic fluorescent proteins: Main properties and recommendations for use

Protein	TagCFP	TagGFP	TagYFP	TagRFP	TagFP635	TurboGFP	TurboYFP	TurboRFP	TurboFP602	TurboFP635	PhiYFP	PhiYFP-m	JRed
Characteristics													
Group	Protein localization tags (TagFPs)					TurboColors basic fluorescent proteins					Other basic fluorescent proteins		
Fluorescence color	cyan	green	yellow	red (orange)	far-red	green	yellow	red (orange)	true-red	far-red	yellow	yellow	true-red
Excitation max	458 nm	482 nm	508 nm	555 nm	588 nm	482 nm	525 nm	553 nm	574 nm	588 nm	525 nm	525 nm	584 nm
Emission max	480 nm	505 nm	524 nm	584 nm	635 nm	502 nm	538 nm	574 nm	602 nm	635 nm	537 nm	537 nm	610 nm
Quantum yield	0.57	0.59	0.62	0.48	0.33	0.53	0.53	0.67	0.35	0.34	0.40	0.39	0.20
Extinction coefficient ($M^{-1}cm^{-1}$)	37 000	58 200	64 000	100 000	45 000	70 000	105 000	92 000	74 400	65 000	130 000	124 000	44 000
Brightness	21.1	34.3	39.7	48.0	14.9	37.1	55.7	61.6	26.0	22.1	52.2	48.4	8.8
Brightness, % of EGFP	64	104	120	145	45	112	169	187	79	67	158	147	26
pKa	4.7	4.7	5.5	3.8	6.0	5.2	5.9	4.4	4.7	5.5	6.0	6.0	5.0
Structure	monomer	monomer	monomer	monomer	monomer	dimer	dimer	dimer	dimer	dimer	dimer	dimer	dimer
Aggregation	no	no	no	no	no	no	at high concentr.	no	no	no	no	no	no
Maturation at 37°C	fast	fast	fast	fast	fast	superfast	superfast	superfast	fast	superfast	fast	fast	slow
Photostability	high	high	high	medium	high	high	high	high	medium	high	high	high	medium
Molecular weight	27 kDa	27 kDa	27 kDa	27 kDa	27 kDa	26 kDa	26 kDa	26 kDa	26 kDa	26 kDa	26 kDa	26 kDa	27 kDa
Recommendations for use													
Cell labeling mammalian bacterial	 +++ ++++	 +++ ++++	 +++ ++++	 +++ ++++	 +++ ++++	 ++++ ++++	 ++++ ++++	 ++++ ++++	 +++ ++++	 ++++ ++++	 ++++ +++	 ++++ +++	 ++ -
Promoter activity testing	+++	+++	+++	+++	+++	++++	++++	++++	++++	++++	+++	+++	++
Stable transfection	proved	proved	proved	proved	not tested	proved	not tested	not tested	proved	proved	proved	proved	proved
In fusions	++++	++++	++++	++++	++++	++	++	++	++	++	++	++	++

Protein localization tags

Monomeric tags for protein labeling

TagFPs are monomeric fluorescent proteins specially designed for generation of fusions. Five available colors allow multicolor labeling of different cellular proteins for protein localization and interaction studies.

TagFPs available:

- cyan fluorescent protein TagCFP

source — jellyfish *Aequorea macrodactyla*

excitation max — 458 nm

emission max — 480 nm

- green fluorescent protein TagGFP

source — jellyfish *Aequorea macrodactyla*

excitation max — 482 nm

emission max — 505 nm

- yellow fluorescent protein TagYFP

source — jellyfish *Aequorea macrodactyla*

excitation max — 508 nm

emission max — 524 nm

- red fluorescent protein TagRFP

source — sea anemone *Entacmaea quadricolor*

excitation max — 555 nm

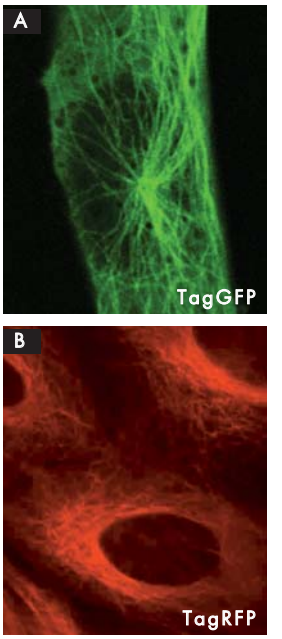
emission max — 584 nm

- far-red fluorescent protein TagFP635

source — sea anemone *Entacmaea quadricolor*

excitation max — 588 nm

emission max — 635 nm



Fluorescent labeling of tubulin filaments in mammalian cells using TagFPs.

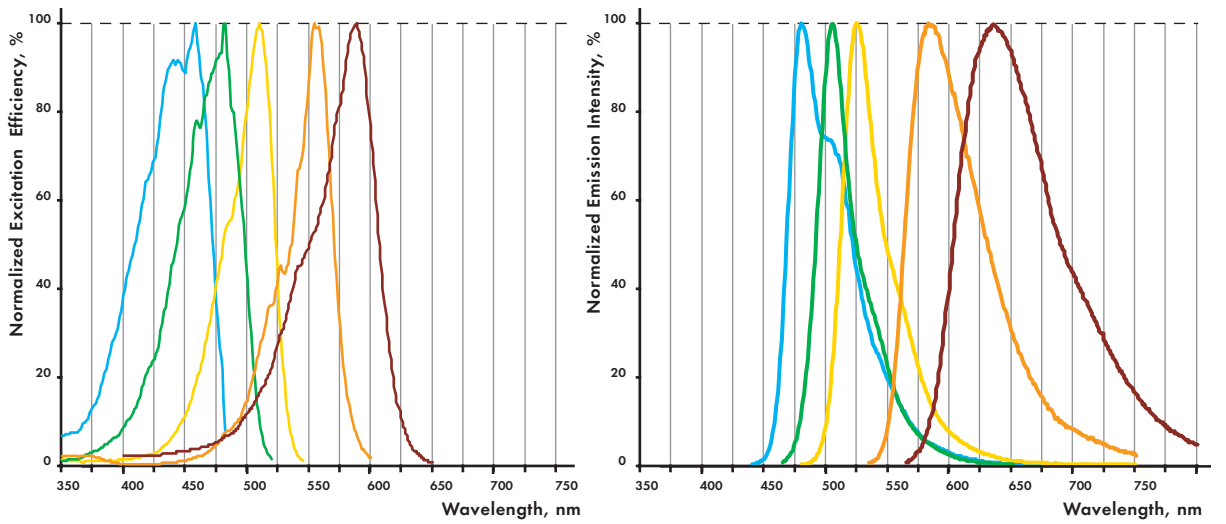
(A) — Transiently transfected HeLa cells; (B) — stably transfected U-205 cells. Photograph of stably transfected cell line was provided by Dr. Christian Petzelt (Marinpharm).

Main properties of TagFPs:

Characteristic	TagCFP	TagGFP	TagYFP	TagRFP	TagFP635
Fluorescence color	cyan	green	yellow	red (orange)	far-red
Excitation max	458 nm	482 nm	508 nm	555 nm	588 nm
Emission max	480 nm	505 nm	524 nm	584 nm	635 nm
Quantum yield	0.57	0.59	0.62	0.48	0.33
Extinction coefficient	37 000 $M^{-1}cm^{-1}$	58 200 $M^{-1}cm^{-1}$	64 000 $M^{-1}cm^{-1}$	100 000 $M^{-1}cm^{-1}$	45 000 $M^{-1}cm^{-1}$
Brightness	21.1	34.3	39.7	48.0	14.9
Brightness, % of EGFP	64	104	120	145	45
pKa	4.7	4.7	5.5	3.8	6.0
Structure	monomer	monomer	monomer	monomer	monomer
Cell Toxicity	not observed	not observed	not observed	not observed	not observed
Aggregation	no	no	no	no	no
Maturation at 37°C	fast	fast	fast	fast	fast
Photostability	high	high	high	medium	high
Molecular weight	27 kDa	27 kDa	27 kDa	27 kDa	27 kDa
Main advantages	Bright cyan monomeric fluorescent protein	Bright green monomeric fluorescent protein	Bright yellow monomeric fluorescent protein	Bright red monomeric fluorescent protein	Bright far-red monomeric fluorescent protein
Possible limitations	no data	no data	no data	medium photostability	no data

Brightness is a product of extinction coefficient and quantum yield, divided by 1000.

TagFPs, excitation/emission spectra



Characteristic	TagCFP	TagGFP	TagYFP	TagRFP	TagFP635
Excitation					
Emission					

TagCFP

- Bright cyan fluorescence
- Monomeric protein with successful performance in fusions
- High pH stability and photostability
- Proven suitability to generate stably transfected cell lines
- Recommended for protein labeling

Protein description

TagCFP is a cyan monomeric protein generated from TagGFP mutant of the wild-type GFP-like protein from jellyfish *Aequorea macrodactyla* [1]. It possesses bright fluorescence with excitation/emission maxima at 458 and 480 nm, respectively. TagCFP is significantly brighter than commonly used ECFP.

Main properties of TagCFP

Characteristic	
Molecular weight	27 kDa
Polypeptide length	239 aa
Fluorescence color	cyan
Excitation max	458 nm
Emission max	480 nm
Quantum yield	0.57
Extinction coefficient	37 000 $M^{-1}cm^{-1}$
Brightness*	21.1
Brightness % of EGFP	64
pKa	4.7
Structure	monomer
Aggregation	no
Maturation at 37°C	fast
Photostability	high

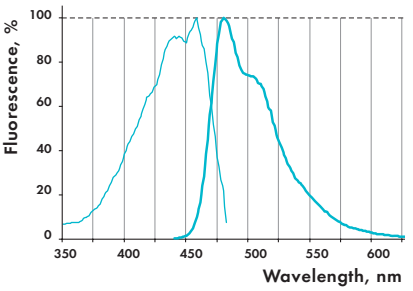
*Brightness is a product of extinction coefficient and quantum yield, divided by 1000.

Performance and use

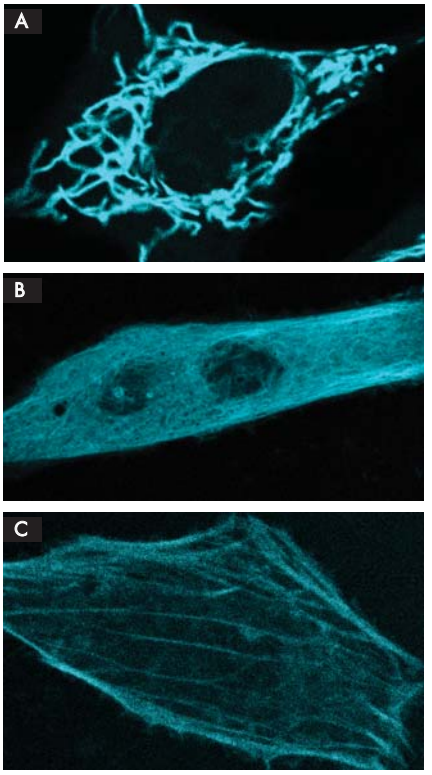
TagCFP is mainly intended for protein labeling in protein localization studies. It can also be used for cell and organelle labeling and for tracking the promoter activity.

TagCFP can be easily expressed and detected in a wide range of organisms. Mammalian cells transiently transfected with TagCFP expression vectors give bright fluorescent signals within 10-12 hrs after transfection. No cell toxic effects and visible protein aggregation are observed.

TagCFP performance in fusions has been demonstrated in human cytoplasmic beta-actin and alpha-tubulin models. Please visit our Web site at www.evrogen.com/TagCFP.shtml to view 3D video of a cell expressing TagCFP-labeled alpha-tubulin filaments.



TagCFP normalized excitation (thin line) and emission (thick line) spectra.
Complete TagCFP spectra in Excel format can be downloaded from the Evrogen Web site at www.evrogen.com/TagCFP.shtml



TagCFP fusions expression in mammalian cells.
(A) — Confocal microscopy of mitochondria-targeted TagCFP expression in transiently transfected HeLa cells; (B) — confocal microscopy of TagCFP fusion with alpha-tubulin in transiently transfected HeLa cells; (C) — confocal microscopy of TagCFP fusion with cytoplasmic beta-actin in transiently transfected HeLa cells.

Application	Performance
Cell labeling	
mammalian cells	+++
bacterial cells	++++
Stable transfection	proved
Promoter activity testing	+++
In fusions	++++

Compatibility with existing filter sets and antibodies

TagCFP can be detected using fluorescence filter sets for ECFP and the similar. Recommended Omega Optical filter sets are XF114-2 and XF130-2.

TagCFP can be recognized using Anti-Tag(CGY)FP antibody (Cat.# AB121-AB122, see page D-6 for description) available from Evrogen.

TagCFP licensing opportunities

Evrogen technology embodied in TagCFP is available for expanded and commercial use with an adaptable licensing program. Benefits from flexible and market-driven license options are offered for upgrade and novel development of products and applications. For licensing information, please contact Evrogen at license@evrogen.com.

TagCFP comprises the following amino acid substitutions compared with wild-type *A. macrodactyla* GFP (AY013824): K3G, T9A, F64L, S65A, Y66W, F99H, I123V, M128E, D129G, N144S, F145A, N146I, H148D, K162E, V163A, T203C, T205S, T214A, F220L, F223S, C227Y, G228C, K238R. It has *77%* amino acid sequence identity with wild-type GFP from *A. victoria*.

References

1. Xia *et al.* (2002) Mar. Biotechnol. 4(2):155-162.

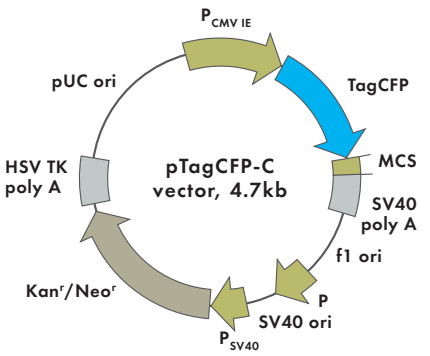
TagCFP-related products

TagCFP-related product line includes expression vectors, recombinant protein, and antibodies. For updated product information, please visit the Evrogen Web site (www.evrogen.com/TagCFP.shtml).

Product	Cat.#	Description	Size	Page
TagCFP expression/source vectors				
pTagCFP-C	FP111	Mammalian expression vector encoding humanized TagCFP and allowing TagCFP expression and generation of fusions to the TagCFP C-terminus	20 µg	A-10
pTagCFP-N	FP112	Mammalian expression vector encoding humanized TagCFP and allowing TagCFP expression and generation of fusions to the TagCFP N-terminus	20 µg	A-10
pTagCFP-actin	FP114	Mammalian expression vector encoding humanized TagCFP fused with human cytoplasmic beta-actin	20 µg	A-11
pTagCFP-tubulin	FP115	Mammalian expression vector encoding humanized TagCFP fused with human alpha-tubulin	20 µg	A-11
pTagCFP-mito	FP117	Mammalian expression vector encoding humanized TagCFP fused with mitochondria localization signal	20 µg	A-12
Recombinant protein				
rTagCFP	FP151	Recombinant cyan fluorescent protein	100 µg	A-12
Antibodies against TagCFP				
Anti-Tag(CGY)FP antibody	AB121 AB122	Rabbit polyclonal antibody against TagCFP, TagGFP, TagYFP, and PS-CFP2.	100 µg 200 µg	D-6

Please contact your local distributor for exact prices and delivery information.

Expression/source vectors: pTagCFP-C



For vector sequence, please visit our Web site at www.evrogen.com/pTagCFP-C.shtml

Product	Cat.#	Size
pTagCFP-C	**FP111**	20 µg

Please contact your local distributor for exact prices and delivery information.

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

Multiple cloning site (MCS)

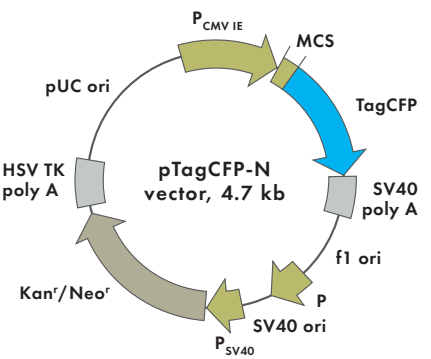
TagCFP → BspE1 BglII SacI EcoRI SalI KpnI ApaI BamHI STOPs

TCC.GGA.CTC.AGA.TCT.CGA.GCT.CAA.GCT.TCG.AAT.TCT.GCA.GTC.GAC.GGT.ACC.GCG.GGC.CCG.GGA.TCC.ACC.GGA.TCT.AGA.TAA.CTG.ATC.A

XhoI HindIII PstI SacII* SmaI/XmaI XbaI# BclI#

* — not unique sites. # — sites are blocked by methylation. If you wish to digest the vector using these sites, you will need to transform the vector into a dam- host and make fresh DNA.

Expression/source vectors: pTagCFP-N



For vector sequence, please visit our Web site at www.evrogen.com/pTagCFP-N.shtml

Product	Cat.#	Size
pTagCFP-N	**FP112**	20 µg

Please contact your local distributor for exact prices and delivery information.

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

Multiple cloning site (MCS)

NheI BglII SacI HindIII EcoRI SalI KpnI ApaI BamHI AgeI TagCFP →

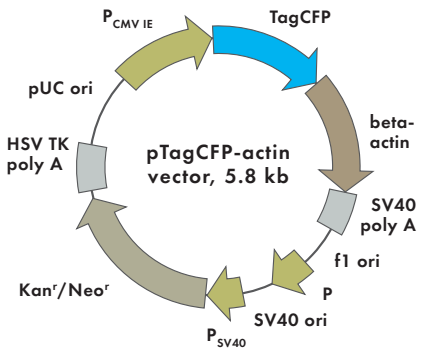
G.CTA.GCG.CTA.CCG.GAC.TCA.GAT.CTC.GAG.CTC.AAG.CTT.CGA.ATT.CTG.CAG.TCG.ACG.GTA.CCG.CGG.GCC.CGG.GAT.CCA.CCG.GTC.GCC.ACC.ATG....

Eco47III XhoI PstI SacII* SmaI/XmaI

* — not unique sites.

Notice to Purchaser — please see page A-12

Expression/source vectors: pTagCFP-actin



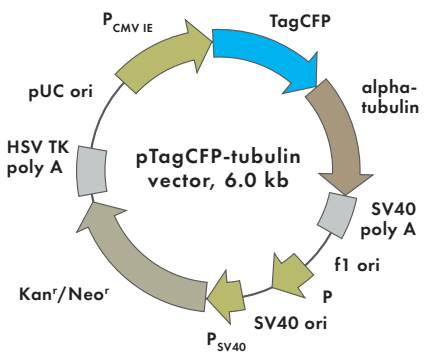
For vector sequence, please visit our Web site at www.evrogen.com/pTagCFP-actin.shtml

Product	Cat.#	Size
pTagCFP-actin	FP114	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	mammalian expression vector
Reporter	TagCFP-actin
Reporter codon usage	mammalian
Promoter	P CMV IE
Host cells	mammalian
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	expression of TagCFP fusion with beta-actin in mammalian cells under the control of CMV promoter for labeling of actin filaments; source of TagCFP-beta-actin fusion coding sequence

Expression/source vectors: pTagCFP-tubulin



For vector sequence, please visit our Web site at www.evrogen.com/pTagCFP-tubulin.shtml

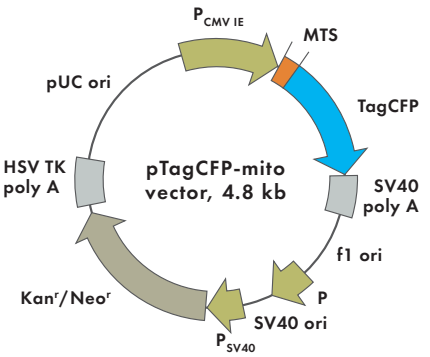
Product	Cat.#	Size
pTagCFP-tubulin	FP115	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	mammalian expression vector
Reporter	TagCFP-tubulin
Reporter codon usage	mammalian
Promoter	P CMV IE
Host cells	mammalian
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	expression of TagCFP fusion with alpha-tubulin in mammalian cells under the control of CMV promoter for labeling of tubulin filaments; source of TagCFP-alpha-tubulin fusion coding sequence

Notice to Purchaser — please see page A-12

Expression/source vectors: pTagCFP-mito



For vector sequence, please visit our Web site at www.evrogen.com/pTagCFP-mito.shtml

Product	Cat.#	Size
pTagCFP-mito	FP117	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	mammalian expression vector
Reporter	TagCFP fusion with mitochondrial targeting sequence (MTS) derived from the subunit VIII of human cytochrome C oxidase
Reporter codon usage	mammalian
Promoter for TagCFP	$P_{CMV\ IE}$
Host cells	mammalian
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	expression of mitochondria-targeted TagCFP in mammalian cells under the control of CMV promoter; source of mitochondria-targeted TagCFP coding sequence

Recombinant protein rTagCFP

Product	Cat.#	Size
rTagCFP	FP151	100 µg

Please contact your local distributor for exact prices and delivery information.

Use

- Standard on protein gels and Western blots
- Control for fluorescence microscopy
- Calibration of fluorimeters and FACS machines
- Microinjection into cells and tissues

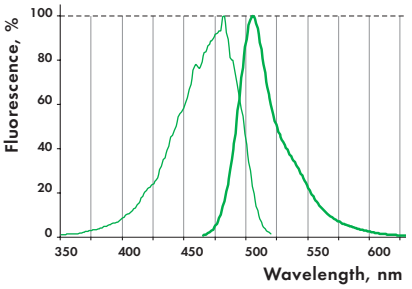
Description

Recombinant TagCFP (rTagCFP) is 27-kDa cyan fluorescent protein. It has excitation and emission spectra identical to those of the expressed TagCFP. rTagCFP is suitable as control reagent for TagCFP expression using the TagCFP expression vectors.

rTagCFP is purified from transformed *E. coli* using organic extraction and hydrophobic chromatography. This method ensures high purity of the recombinant protein and maintenance of fluorescence. The protein concentration is measured by chromophore absorption. rTagCFP contains 6xHis tag at its N-terminus.

TagGFP

- Bright green fluorescence
- Monomeric protein with successful performance in fusions
- High pH stability and photostability
- Proven suitability to generate stably transfected cell lines
- Recommended for protein labeling



TagGFP normalized excitation (thin line) and emission (thick line) spectra.

Complete TagGFP spectra in Excel format can be downloaded from the Evrogen Web site at www.evrogen.com/TagGFP.shtml

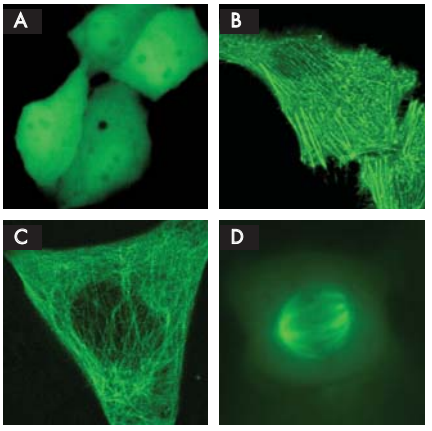
Protein description

TagGFP is an enhanced mutant of wild-type GFP-like protein from jellyfish *Aequorea macrodactyla* [1]. It possesses bright green fluorescence with excitation/emission maxima at 482 and 505 nm, respectively. TagGFP is optimized for expression at 37°C. It is more pH-stable than EGFP.

Main properties of TagGFP

Characteristic	
Molecular weight	27 kDa
Polypeptide length	238 aa
Fluorescence color	green
Excitation max	482 nm
Emission max	505 nm
Quantum yield	0.59
Extinction coefficient	58 200 $M^{-1}cm^{-1}$
Brightness*	34.3
Brightness % of EGFP	104
pKa	4.7
Structure	monomer
Aggregation	no
Maturation at 37°C	fast
Photostability	high

*Brightness is a product of extinction coefficient and quantum yield, divided by 1000.



TagGFP use for cell and protein labeling.

(A) — Whole-cell expression in transiently transfected HeLa cells; (B) — expression of TagGFP fusion with beta-actin in transiently transfected HeLa cells; (C) — expression of TagGFP fusion with alpha-tubulin in transiently transfected HeLa cells; (D) — expression of TagGFP fusion with alpha-tubulin in stably transfected MDCK canine kidney epithelial cells.
Photograph of stably transfected cell line was provided by Dr. Christian Petzelt (Marinpharm).

Performance and use

Because of monomeric nature, TagGFP is mainly intended for protein localization studies and expression in long-term cell cultures. It can also be used for cell labeling and gene expression analysis, although TurboGFP is preferable for such applications because it matures faster and gives brighter fluorescent signal.

TagGFP can be easily expressed and detected in a wide range of organisms. Being expressed in mammalian cells, TagGFP shows brightness and maturation speed similar to those of EGFP. However, compared with EGFP, TagGFP matures more than two times faster in *E. coli* cells.

Mammalian cells transiently transfected with TagGFP expression vectors give bright fluorescent signals within 10-12 hrs after transfection. No cell

toxic effects and visible protein aggregation are observed. TagGFP performance in fusions has been demonstrated in the beta-actin and alpha-tubulin models. Please visit our Web site at www.evrogen.com/TagGFP.shtml to see 3D video of a cell expressing TagGFP-labeled alpha-tubulin filaments.

In addition, TagGFP suitability to generate stably transfected cells has been proven by Marinpharm company. Cell lines expressing TagGFP fusion with alpha-tubulin are commercially available.

Application	Performance
Cell labeling	
mammalian cells	+++
bacterial cells	++++
Stable transfection	proved
Promoter activity testing	+++
In fusions	++++

Compatibility with existing filter sets and antibodies

TagGFP can be detected using common fluorescence filter sets for EGFP, FITC, and other green dyes. Recommended Omega Optical filter sets are QMAX-Green, XF100-2, XF100-3, XF115-2, and XF116-2.

The protein can be recognized using Anti-Tag(CGY)FP antibody (Cat.# AB121-AB122, see page D-6 for description) available from Evrogen.

TagGFP licensing opportunities

Evrogen technology embodied in TagGFP is available for expanded and commercial use with an adaptable licensing program. Benefits from flexible and market-driven license options are offered for upgrade and novel development of products and applications. For licensing information, please contact Evrogen at license@evrogen.com.

TagGFP comprises the following amino acid substitutions as compared with wild-type *A. macrodactyla* GFP (AY013824): K3G, T9A, F64L, S65C, F99L, M128K, N144S, K162E, I167T, T214A, F220L, F223S, G228C, K238R. It has 79% amino acid sequence identity with wild-type GFP from *A. victoria*.

References

1. Xia *et al.* (2002) Mar. Biotechnol. 4(2):155-162.

TagGFP-related products

TagGFP-related product line includes expression vectors, recombinant protein, and antibodies. For updated product information, please visit the Evrogen Web site (www.evrogen.com/TagGFP.shtml).

Product	Cat.#	Description	Size	Page
TagGFP expression/source vectors				
pTagGFP-C	FP121	Mammalian expression vector encoding humanized TagGFP and allowing TagGFP expression and generation of fusions to the TagGFP C-terminus	20 µg	A-16
pTagGFP-N	FP122	Mammalian expression vector encoding humanized TagGFP and allowing TagGFP expression and generation of fusions to the TagGFP N-terminus	20 µg	A-16
pTagGFP-actin	FP124	Mammalian expression vector encoding humanized TagGFP fused with human cytoplasmic beta-actin	20 µg	A-17
pTagGFP-tubulin	FP125	Mammalian expression vector encoding humanized TagGFP fused with human alpha-tubulin	20 µg	A-17
pTagGFP-mito	FP127	Mammalian expression vector encoding humanized TagGFP fused with mitochondria localization signal	20 µg	A-18
Recombinant protein				
rTagGFP	FP152	Recombinant green fluorescent protein	100 µg	A-18
Antibodies against TagGFP				
Anti-Tag(CGY)FP antibody	AB121 AB122	Rabbit polyclonal antibody against TagCFP, TagGFP, TagYFP, and PS-CFP2	100 µg 200 µg	D-6

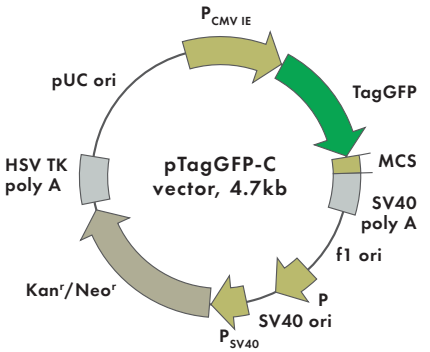
Please contact your local distributor for exact prices and delivery information.

Third party products: stably transfected cell lines expressing TagGFP

Cell line	Source	Description
MDCK-TAG-Tu	canine	MDCK canine kidney epithelial cells expressing TagGFP fusion with alpha-tubulin
T24-TG-TAG-Tu	human	T24 human bladder carcinoma expressing TagGFP fusion with alpha-tubulin

Cell lines are manufactured by Marinpharm GmbH (Berlin, Germany) under the Evrogen license.

Expression/source vectors: pTagGFP-C



For vector sequence, please visit our Web site at www.evrogen.com/pTagGFP-C.shtml

Product	Cat.#	Size
pTagGFP-C	FP121	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	mammalian expression vector
Reporter	TagGFP
Reporter codon usage	mammalian
Promoter for TagGFP	P CMV IE
Host cells	mammalian
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	generation of fusions to the TagGFP C-terminus; expression of TagGFP or its fusions in mammalian cells

Multiple cloning site (MCS)

TagGFP → BspE1 BglII SacI EcoRI SalI KpnI ApaI BamHI STOPs

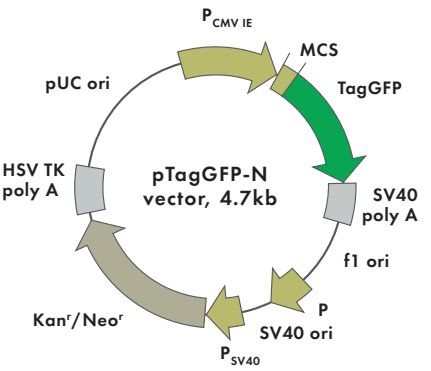
TCC.GGA.CTC.AGA.TCT.CGA.GCT.CAA.GCT.TCG.AAT.TCT.GCA.GTC.GAC.GGT.ACC.GCG.GGC.CCG.GGA.TCC.ACC.GGA.TCT.AGA.TAA.CTG.ATC.A

XhoI HindIII PstI SacII* SmaI/XmaI XbaI# BclI#

* — not unique sites;

\# — sites are blocked by methylation. If you wish to digest the vector using these sites, you will need to transform the vector into a dam⁻ host and make fresh DNA.

Expression/source vectors: pTagGFP-N



For vector sequence, please visit our Web site at www.evrogen.com/pTagGFP-N.shtml

Product	Cat.#	Size
pTagGFP-N	FP122	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	mammalian expression vector
Reporter	TagGFP
Reporter codon usage	mammalian
Promoter for TagGFP	P CMV IE
Host cells	mammalian
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	generation of fusions to the TagGFP N-terminus; expression of TagGFP or its fusions in mammalian cells

Multiple cloning site (MCS)

NheI BglII SacI HindIII EcoRI SalI KpnI ApaI BamHI AgeI TagGFP →

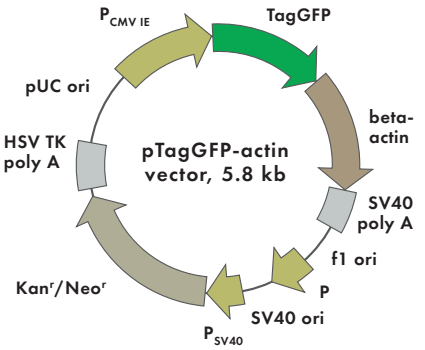
G.CTA.GCG.CTA.CCG.GAC.TCA.GAT.CTC.GAG.CTC.AAG.CTT.CGA.ATT.CTG.CAG.TCG.ACG.GTA.CCG.CGG.GCC.CGG.GAT.CCA.CCG.GTC.GCC.ACC.ATG....

Eco47III XhoI PstI SacII* SmaI/XmaI

* — not unique sites.

Notice to Purchaser — please see page A-18

Expression/source vectors: pTagGFP-actin



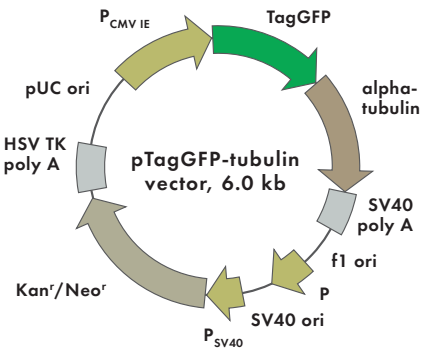
For vector sequence, please visit our Web site at www.evrogen.com/pTagGFP-actin.shtml

Product	Cat.#	Size
pTagGFP-actin	**FP124**	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	mammalian expression vector
Reporter	TagGFP-actin
Reporter codon usage	mammalian
Promoter	$P_{CMV\ IE}$
Host cells	mammalian
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	expression of TagGFP fusion with beta-actin in mammalian cells under the control of CMV promoter for labeling of actin filaments; source of TagGFP-beta-actin fusion coding sequence

Expression/source vectors: pTagGFP-tubulin



For vector sequence, please visit our Web site at www.evrogen.com/pTagGFP-tubulin.shtml

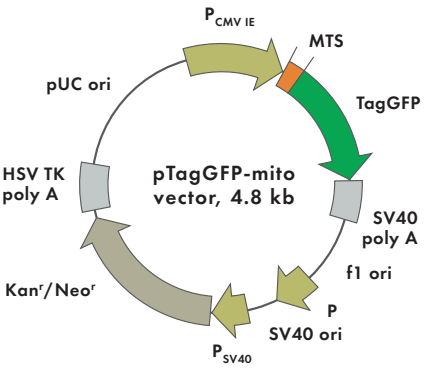
Product	Cat.#	Size
pTagGFP-tubulin	**FP125**	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	mammalian expression vector
Reporter	TagGFP-tubulin
Reporter codon usage	mammalian
Promoter	$P_{CMV\ IE}$
Host cells	mammalian
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	expression of TagGFP fusion with alpha-tubulin in mammalian cells under the control of CMV promoter for labeling of tubulin filaments; source of TagGFP-alpha-tubulin fusion coding sequence

Notice to Purchaser — please see page A-18

Expression/source vectors: pTagGFP-mito



For vector sequence, please visit our Web site at www.evrogen.com/pTagGFP-mito.shtml

Product	Cat.#	Size
pTagGFP-mito	FP127	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	mammalian expression vector
Reporter	TagGFP fusion with mitochondrial targeting sequence (MTS) derived from the subunit VIII of human cytochrome C oxidase
Reporter codon usage	mammalian
Promoter for TagGFP-MTS	$P_{CMV\ IE}$
Host cells	mammalian
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	expression of mitochondria-targeted TagGFP in mammalian cells under the control of CMV promoter; source of mitochondria-targeted TagGFP coding sequence

Recombinant protein rTagGFP

Product	Cat.#	Size
rTagGFP	FP152	100 µg

Please contact your local distributor for exact prices and delivery information.

Use

- Standard on protein gels and Western blots
- Control for fluorescence microscopy
- Calibration of fluorimeters and FACS machines
- Microinjection into cells and tissues

Description

Recombinant TagGFP (rTagGFP) is 27-kDa green fluorescent protein. It has excitation and emission spectra identical to those of the expressed TagGFP. rTagGFP is suitable as control reagent for TagGFP expression using the TagGFP expression vectors.

rTagGFP is purified from transformed *E. coli* using organic extraction and hydrophobic chromatography. This method ensures high purity of the recombinant protein and maintenance of fluorescence. The protein concentration is measured by chromophore absorption. rTagGFP contains 6xHis tag at its N-terminus.

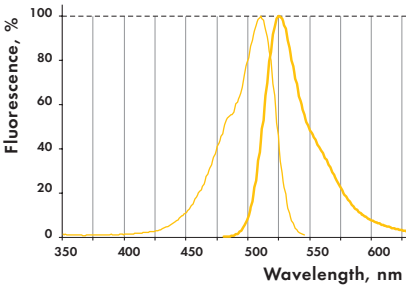
MATERIAL SAFETY DATA SHEET INFORMATION
To the best of our knowledge, these products do not require a Material Safety Data Sheet. However, all the properties of these products (and, if applicable, each of their components) have not been thoroughly investigated. Therefore, we recommend that you use gloves and eye protection, and wear a laboratory coat when working with these products.

TagYFP

- Bright yellow fluorescence
- Monomeric protein with successful performance in fusions
- High pH stability and photostability
- Recommended for protein labeling

Protein description

TagYFP is a monomeric yellow fluorescent protein developed from the green fluorescent protein TagGFP. TagYFP possesses single excitation maximum at 508 nm, and emission maximum at 524 nm. TagYFP is more pH stable than EYFP.

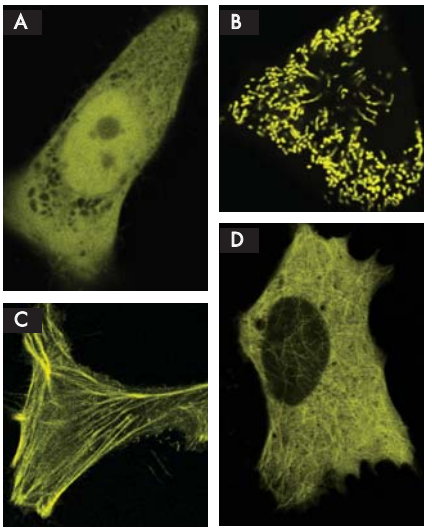


TagYFP normalized excitation (thin line) and emission (thick line) spectra.
Complete TagYFP spectra in Excel format can be downloaded from the Evrogen Web site at www.evrogen.com/TagYFP.shtml

Main properties of TagYFP

Characteristic	
Molecular weight	27 kDa
Polypeptide length	239 aa
Fluorescence color	yellow
Excitation max	508 nm
Emission max	524 nm
Quantum yield	0.62
Extinction coefficient	64 000 $M^{-1}cm^{-1}$
Brightness*	39.7
Brightness % of EGFP	120
pKa	5.5
Structure	monomer
Aggregation	no
Maturation at 37°C	fast
Photostability	high

*Brightness is a product of extinction coefficient and quantum yield, divided by 1000.



TagYFP expression in mammalian cells.
(A) — Confocal microscopy of cytoplasmic TagYFP expression in transiently transfected human HeLa cells; (B) — confocal microscopy of mitochondria-targeted TagYFP expression in transiently transfected HeLa cells; (C) — confocal microscopy of TagYFP fusion with the cytoplasmic beta-actin in transiently transfected 3T3 cells; (D) — confocal microscopy of TagYFP fusion with the alpha-tubulin in transiently transfected 3T3 cells.

Performance and use

TagYFP is mainly intended for protein labeling. It can also be used for cell and organelle labeling and for tracking the promoter activity, although TurboYFP and Phi-Yellow proteins are preferable for such applications because they mature faster and give brighter fluorescent signal.

TagYFP can be easily expressed and detected in a wide range of organisms. Mammalian cells transiently transfected with TagYFP expression vectors give bright fluorescent signals within 10-12 hrs after transfection. No cell toxic effects and visible protein aggregation are observed.

TagYFP performance in fusions has been demonstrated in human cytoplasmic beta-actin and alpha-tubulin models. An expected pattern of fluorescence has been obtained in each case.

Application	Performance
Cell labeling	
mammalian cells	+++
bacterial cells	++++
Stable transfection	proved
Promoter activity testing	+++
In fusions	++++

Compatibility with existing filter sets and antibodies

Recommended Omega Optical filter sets for TagYFP are XF104-3 and XF105-2. It can also be detected using Chroma Technology corporation filter set 41028 Yellow GFP BP (10C/Topaz) or the similar.

The protein can be recognized using Anti-Tag(CGY)FP antibody (Cat.# AB121-AB122, see page D-6 for description) available from Evrogen.

TagYFP licensing opportunities

Evrogen technology embodied in TagYFP is available for expanded and commercial use with an adaptable licensing program. Benefits from flexible and market-driven license options are offered for upgrade and novel development of products and applications. For licensing information, please contact Evrogen at license@evrogen.com.

TagYFP comprises the following amino acid substitutions as compared with wild-type *A. macrodactyla* GFP (AY013824): K3G, T9A, F64L, S65T, I68V, E76K, F99L, M128K, M153T, N144S, K162E, I167T, T203Y, A206D, T214A, F220L, F223S, F224V, G228S, K238R. It has 78% amino acid sequence identity with wild-type GFP from *A. victoria*.

TagYFP-related products

TagYFP-related product line includes expression vectors, recombinant protein, and antibodies. For updated product information, please visit the Evrogen Web site (www.evrogen.com/TagYFP.shtml).

Product	Cat.#	Description	Size	Page
TagYFP expression/source vectors				
pTagYFP-C	FP131	Mammalian expression vector encoding humanized TagYFP and allowing TagYFP expression and generation of fusions to the TagYFP C-terminus	20 µg	A-22
pTagYFP-N	FP132	Mammalian expression vector encoding humanized TagYFP and allowing TagYFP expression and generation of fusions to the TagYFP N-terminus	20 µg	A-22
pTagYFP-actin	FP134	Mammalian expression vector encoding humanized TagYFP fused with human cytoplasmic beta-actin	20 µg	A-23
pTagYFP-tubulin	FP135	Mammalian expression vector encoding humanized TagYFP fused with human alpha-tubulin	20 µg	A-23
pTagYFP-mito	FP137	Mammalian expression vector encoding humanized TagYFP fused with a mitochondria localization signal	20 µg	A-24
Recombinant protein				
rTagYFP	FP153	Recombinant yellow fluorescent protein	100 µg	A-24
Antibodies against TagYFP				
Anti-Tag(CGY)FP antibody	AB121 AB122	Rabbit polyclonal antibody against TagCFP, TagGFP, TagYFP, and PS-CFP2	100 µg 200 µg	D-6

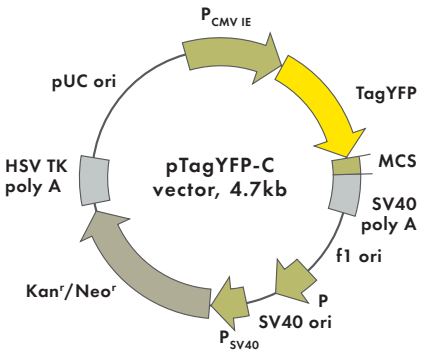
Please contact your local distributor for exact prices and delivery information.

Third party products: stably transfected cell lines expressing TagYFP

Cell line	Source	Description
U205-TAG-YFP-Actin	human	Human osteosarcoma line U205 expressing TagYFP fusion with beta-actin

Cell lines are manufactured by Marinpharm GmbH (Berlin, Germany) under the Evrogen license.

Expression/source vectors: pTagYFP-C



For vector sequence, please visit our Web site at www.evrogen.com/pTagYFP-C.shtml

Product	Cat.#	Size
pTagYFP-C	**FP131**	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	mammalian expression vector
Reporter	TagYFP
Reporter codon usage	mammalian
Promoter for TagYFP	P CMV IE
Host cells	mammalian
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	generation of fusions to the TagYFP C-terminus; expression of TagYFP or its fusions in mammalian cells

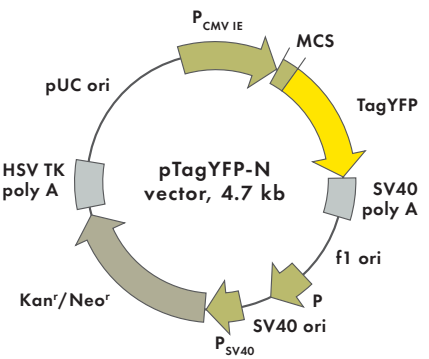
Multiple cloning site (MCS)

TagYFP →

BspE1	BglII	SacI		EcoRI		SalI	KpnI		ApaI	BamHI		STOPs		
TCC.GGA.CTC.AGA.TCT.CGA.GCT.CAA.GCT.TCG.AAT.TCT.GCA.GTC.GAC.GGT.ACC.GCG.GGC.CCG.GGA.TCC.ACC.GGA.TCT.AGA.TAA.CTG.ATC.A														
		XhoI		HindIII		PstI*			SacII*	SmaI/XmaI			XbaI#	BclI#

* — not unique sites;
\# — sites are blocked by methylation. If you wish to digest the vector using these sites, you will need to transform the vector into a dam⁻ host and make fresh DNA.

Expression/source vectors: pTagYFP-N



For vector sequence, please visit our Web site at www.evrogen.com/pTagYFP-N.shtml

Product	Cat.#	Size
pTagYFP-N	**FP132**	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	mammalian expression vector
Reporter	TagYFP
Reporter codon usage	mammalian
Promoter for TagYFP	P CMV IE
Host cells	mammalian
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	generation of fusions to the TagYFP N-terminus; expression of TagYFP or its fusions in mammalian cells

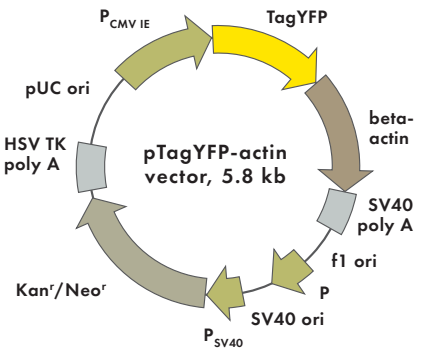
Multiple cloning site (MCS)

NheI		BglII	SacI	HindIII	EcoRI	SalI	KpnI	ApaI	BamHI	AgeI	TagYFP →
G.CTA.GCG.CTA.CCG.GAC.TCA.GAT.CTC.GAG.CTC.AAG.CTT.CGA.ATT.CTG.CAG.TCG.ACG.GTA.CCG.CGG.GCC.CGG.GAT.CCA.CCG.GTC.GCC.ACC.ATG....											
	Eco47III		XhoI			PstI*		SacII*	SmaI/XmaI		

* — not unique sites.

Notice to Purchaser — please see page A-24

Expression/source vectors: pTagYFP-actin



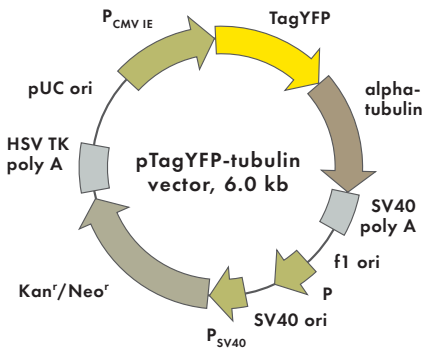
For vector sequence, please visit our Web site at www.evrogen.com/pTagYFP-actin.shtml

Product	Cat.#	Size
pTagYFP-actin	FP134	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	mammalian expression vector
Reporter	TagYFP-actin
Reporter codon usage	mammalian
Promoter	P CMV IE
Host cells	mammalian
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	expression of TagYFP fusion with beta-actin in mammalian cells under the control of CMV promoter for labeling of actin filaments; source of TagYFP-beta-actin fusion coding sequence

Expression/source vectors: pTagYFP-tubulin



For vector sequence, please visit our Web site at www.evrogen.com/pTagYFP-tubulin.shtml

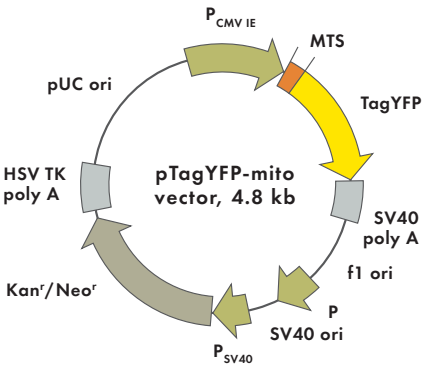
Product	Cat.#	Size
pTagYFP-tubulin	FP135	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	mammalian expression vector
Reporter	TagYFP-tubulin
Reporter codon usage	mammalian
Promoter	P CMV IE
Host cells	mammalian
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	expression of TagYFP fusion with alpha-tubulin in mammalian cells under the control of CMV promoter for labeling of tubulin filaments; source of TagYFP-alpha-tubulin fusion coding sequence

Notice to Purchaser — please see page A-24

Expression/source vectors: pTagYFP-mito



For vector sequence, please visit our Web site at www.evrogen.com/pTagYFP-mito.shtml

Product	Cat.#	Size
pTagYFP-mito	FP137	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	mammalian expression vector
Reporter	TagYFP fusion with mitochondrial targeting sequence (MTS) derived from the subunit VIII of human cytochrome C oxidase
Reporter codon usage	mammalian
Promoter for TagYFP-MTS	$P_{CMV\ IE}$
Host cells	mammalian
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	expression of mitochondria-targeted TagYFP in mammalian cells under the control of CMV promoter; source of mitochondria-targeted TagYFP coding sequence

Recombinant protein rTagYFP

Product	Cat.#	Size
rTagYFP	FP153	100 µg

Please contact your local distributor for exact prices and delivery information.

Use

- Standard on protein gels and Western blots
- Control for fluorescence microscopy
- Calibration of fluorimeters and FACS machines
- Microinjection into cells and tissues

Description

Recombinant TagYFP (rTagYFP) is 27-kDa yellow fluorescent protein. It has excitation and emission spectra identical to those of the expressed TagYFP. rTagYFP is suitable as control reagent for TagYFP expression using the TagYFP expression vectors.

TagYFP is purified from transformed *E. coli* using organic extraction and hydrophobic chromatography. This method ensures high purity of the recombinant protein and maintenance of fluorescence. The protein concentration is measured by chromophore absorption. rTagYFP contains 6xHis tag at its N-terminus.

MATERIAL SAFETY DATA SHEET INFORMATION
To the best of our knowledge, these products do not require a Material Safety Data Sheet. However, all the properties of these products (and, if applicable, each of their components) have not been thoroughly investigated. Therefore, we recommend that you use gloves and eye protection, and wear a laboratory coat when working with these products.

TagRFP

- Bright red (orange) fluorescence
- Monomeric protein with successful performance in fusions
- High pH stability
- Proven suitability to generate stably transfected cell lines
- Recommended for protein labeling

Protein description

TagRFP is a novel monomeric red fluorescent protein generated from the wild-type RFP from sea anemone *Entacmaea quadricolor* [1]. TagRFP is about three times brighter than mCherry protein [2], which makes it the brightest monomeric red fluorescent protein available so far. TagRFP becomes clearly detectable in mammalian cells as early as within 10-12 hrs after transfection.

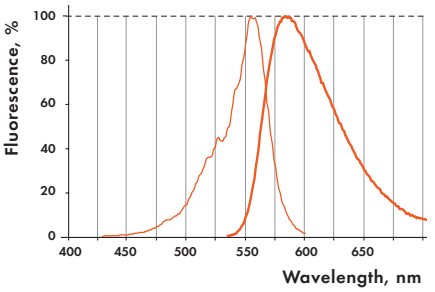
Main properties of TagRFP

Characteristic	
Molecular weight	27 kDa
Polypeptide length	237 aa
Fluorescence color	red (orange)
Excitation max	555 nm
Emission max	584 nm
Quantum yield	0.48
Extinction coefficient	100 000 $M^{-1}cm^{-1}$
Brightness*	48.0
Brightness % of EGFP	145
pKa	3.8
Structure	monomer
Aggregation	no
Maturation at 37°C	fast
Photostability	medium

*Brightness is a product of extinction coefficient and quantum yield, divided by 1000.

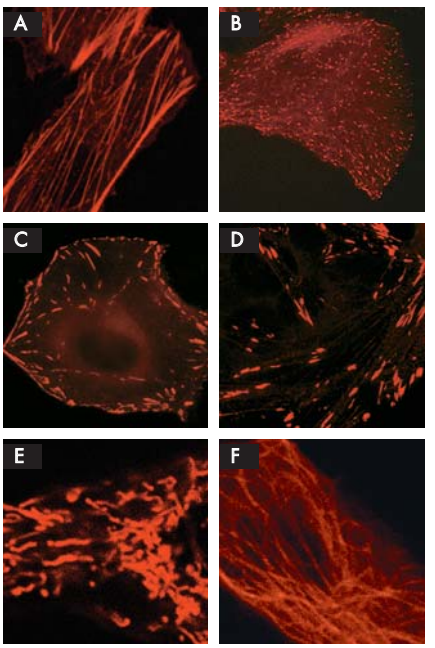
Performance and use

Application	Performance
Cell labeling	
mammalian cells	+++
bacterial cells	++++
Stable transfection	proved
Promoter activity testing	+++
In fusions	++++



TagRFP normalized excitation (thin line) and emission (thick line) spectra.

Complete TagRFP spectra in Excel format can be downloaded from the Evrogen Web site at www.evrogen.com/TagRFP.shtml



TagRFP use for cell and protein labeling.

(A) — HeLa cells expressing TagRFP fusion with beta-actin; image from [1]; (B) — HeLa cells expressing TagRFP fusion with end-binding protein 3 (EB3); (C) — HeLa cells expressing TagRFP fusion with vinculin; (D) —HeLa cells expressing TagRFP fusion with zyxin; (E) — HeLa cells expressing TagRFP targeted to mitochondria; (F) — HeLa cells expressing TagRFP fusion with alpha-tubulin. Images B-D were kindly provided by Michael W. Davidson (Florida State University).

TagRFP is mainly intended for protein labeling. It can also be used for cell and organelle labeling and for tracking the promoter activity; however, TurboRFP is preferable for these applications as it is brighter and more photostable than TagRFP.

Successful performance of TagRFP in fusions has been demonstrated in fibrillarin, Bid protein, beta-actin, alpha-tubulin, and other models.

Compatibility with existing filter sets and antibodies

Recommended Omega Optical filter sets are QMAX-Yellow, XF108-2, XF101-2, and XF111-2. TagRFP can also be detected using TRITC filter set or similar. TagRFP can be recognized using Anti-tRFP antibody (Cat.# AB231-AB232, page D-9) available from Evrogen.

TagRFP licensing opportunities

Evrogen technology embodied in TagRFP is available for expanded and commercial use with an adaptable licensing program. Benefits from flexible and market-driven license options are offered for upgrade and novel development of products and applications.

For licensing information, please contact Evrogen at license@evrogen.com.

References

1. Merzlyak *et al.* (2007) Nat. Methods. 4(7): 555-557.
2. Shaner *et al.* (2004) Nat. Biotechnol. 12: 1567-1572.

TagRFP-related products

TagRFP-related product line includes expression and source vectors, recombinant protein, and antibodies. For updated product information, please visit the Evrogen Web site (www.evrogen.com/TagRFP.shtml).

Product	Cat.#	Description	Size	Page
TagRFP expression/source vectors				
pTagRFP-C	FP141	Mammalian expression vector encoding humanized TagRFP and allowing TagRFP expression and generation of fusions to the TagRFP C-terminus	20 µg	A-28
pTagRFP-N	FP142	Mammalian expression vector encoding humanized TagRFP and allowing TagRFP expression and generation of fusions to the TagRFP N-terminus	20 µg	A-28
pTagRFP-actin	FP144	Mammalian expression vector encoding humanized TagRFP fused with human beta-actin	20 µg	A-29
pTagRFP-tubulin	FP145	Mammalian expression vector encoding humanized TagRFP fused with human alpha-tubulin	20 µg	A-29
pTagRFP-mito	FP147	Mammalian expression vector encoding humanized TagRFP fused with mitochondria localization signal	20 µg	A-30
Recombinant protein				
rTagRFP	FP154	Recombinant red fluorescent protein TagRFP	100 µg	A-30
Antibodies against TagRFP				
Anti-tRFP antibody	AB231 AB232	Rabbit polyclonal antibody against TagRFP, TagFP635, TurboRFP, TurboFP602, and TurboFP635 proteins	100 µg 200 µg	D-9

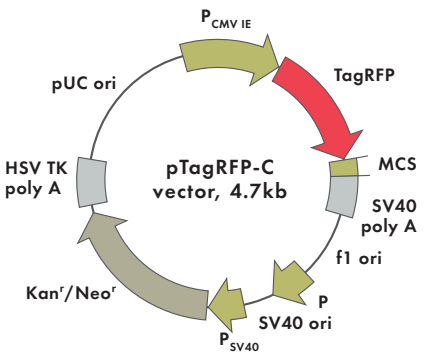
Please contact your local distributor for exact prices and delivery information.

Third party products: stably transfected cell lines expressing TagRFP

Cell line	Source	Description
U205-TAG-RFP-Actin	human	Human osteosarcoma line U205 expressing TagRFP fusion with beta-actin
U205-TAG-RFP-Tubulin	human	Human osteosarcoma line U205 expressing TagRFP fusion with alpha-tubulin

Cell lines are manufactured by Marinpharm GmbH (Berlin, Germany) under the Evrogen license.

Expression/source vectors: pTagRFP-C



For vector sequence, please visit our Web site at www.evrogen.com/pTagRFP-C.shtml

Product	Cat.#	Size
pTagRFP-C	**FP141**	20 µg

Please contact your local distributor for exact prices and delivery information.

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	generation of fusions to the TagRFP C-terminus; expression of TagRFP or its fusions in mammalian cells

Multiple cloning site (MCS)

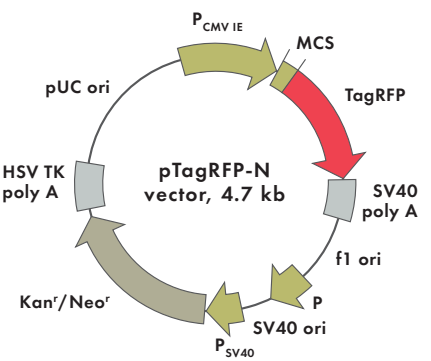
TagRFP → BspE1 BglII SacI EcoRI SalI KpnI ApaI BamHI STOPs

TCC.GGA.CTC.AGA.TCT.CGA.GCT.CAA.GCT.TCG.AAT.TCT.GCA.GTC.GAC.GGT.ACC.GCG.GGC.CCG.GGA.TCC.ACC.GGA.TCT.AGA.TAA.CTG.ATC.A

XhoI HindIII PstI SacII SmaI/XmaI XbaI# BclI#

— sites are blocked by methylation. If you wish to digest the vector using these sites, you will need to transform the vector into a dam$^-$ host and make fresh DNA.

Expression/source vectors: pTagRFP-N



For vector sequence, please visit our Web site at www.evrogen.com/pTagRFP-N.shtml

Product	Cat.#	Size
pTagRFP-N	**FP142**	20 µg

Please contact your local distributor for exact prices and delivery information.

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	generation of fusions to the TagRFP N-terminus; expression of TagRFP or its fusions in mammalian cells

Multiple cloning site (MCS)

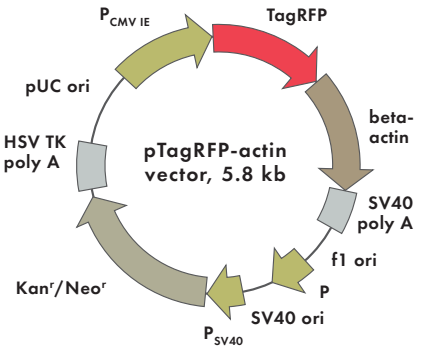
NheI BglII SacI HindIII EcoRI SalI KpnI ApaI BamHI AgeI → TagRFP

G.CTA.GCG.CTA.CCG.GAC.TCA.GAT.CTC.GAG.CTC.AAG.CTT.CGA.ATT.CTG.CAG.TCG.ACG.GTA.CCG.CGG.GCC.CGG.GAT.CCA.CCG.GTC.GCC.ACC.ATG....

Eco47III XhoI PstI SacII SmaI/XmaI

Notice to Purchaser — please see page A-30

Expression/source vectors: pTagRFP-actin



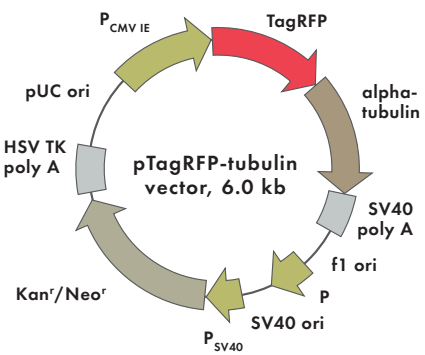
For vector sequence, please visit our Web site at www.evrogen.com/pTagRFP-actin.shtml

Product	Cat.#	Size
pTagRFP-actin	**FP144**	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	mammalian expression vector
Reporter	TagRFP-actin
Reporter codon usage	mammalian
Promoter	$P_{CMV\ IE}$
Host cells	mammalian
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	expression of TagRFP fusion with beta-actin in mammalian cells under the control of CMV promoter for labeling of actin filaments; source of TagRFP-beta-actin fusion coding sequence

Expression/source vectors: pTagRFP-tubulin



For vector sequence, please visit our Web site at www.evrogen.com/pTagRFP-tubulin.shtml

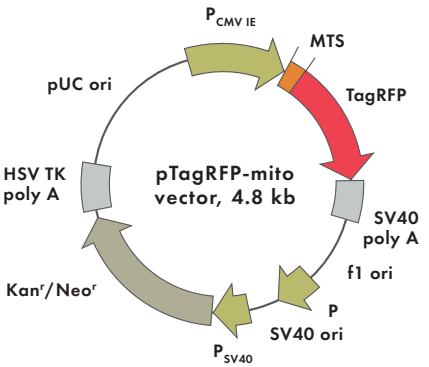
Product	Cat.#	Size
pTagRFP-tubulin	**FP145**	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	mammalian expression vector
Reporter	TagRFP-tubulin
Reporter codon usage	mammalian
Promoter	$P_{CMV\ IE}$
Host cells	mammalian
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	expression of TagRFP fusion with alpha-tubulin in mammalian cells under the control of CMV promoter for labeling of tubulin filaments; source of TagRFP-alpha-tubulin fusion coding sequence

Notice to Purchaser — please see page A-30

Expression/source vectors: pTagRFP-mito



For vector sequence, please visit our Web site at www.evrogen.com/pTagRFP-mito.shtml

Product	Cat.#	Size
pTagRFP-mito	FP147	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	mammalian expression vector
Reporter	TagRFP fusion with mitochondrial targeting sequence (MTS) derived from the subunit VIII of human cytochrome C oxidase
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	expression of mitochondria-targeted TagRFP in mammalian cells under the control of CMV promoter; source of mitochondria-targeted TagRFP coding sequence

Recombinant protein rTagRFP

Product	Cat.#	Size
rTagRFP	FP154	100 µg

Please contact your local distributor for exact prices and delivery information.

Use

- Standard on protein gels and Western blots
- Control for fluorescence microscopy
- Calibration of fluorimeters and FACS machines
- Microinjection into cells and tissues

Description

Recombinant TagRFP (rTagRFP) is a 27-kDa red fluorescent protein. It has excitation and emission spectra identical to those of the expressed TagRFP. rTagRFP is suitable as control reagent for TagRFP expression using the TagRFP expression vectors.

rTagRFP is purified from transformed *E. coli* using organic extraction and hydrophobic chromatography. This method ensures high purity of the recombinant protein and maintenance of fluorescence. The protein concentration is measured by chromophore absorption. rTagRFP contains 6xHis tag at its N-terminus.

TagFP635

- Bright far-red fluorescence
- Monomeric protein with successful performance in fusions
- High photostability
- Recommended for protein labeling
- Fluorescent signal is easily distinguished from background fluorescence

Protein description

TagFP635 (scientific name mKate) is a novel monomeric far-red fluorescent protein generated from the wild-type RFP from sea anemone *Entacmaea quadricolor* [1]. TagFP635 is 6.4-fold brighter than mPlum, 1.25-fold brighter and much more photostable than mRaspberry [1,2], which makes it the best monomeric far-red fluorescent protein available so far. TagFP635 fluorescence allows easy and reliable separation from standard green fluorescent labels in dual-color high-throughput assays. TagFP635 becomes clearly detectable in mammalian cells as early as within 12-14 hrs after transfection.

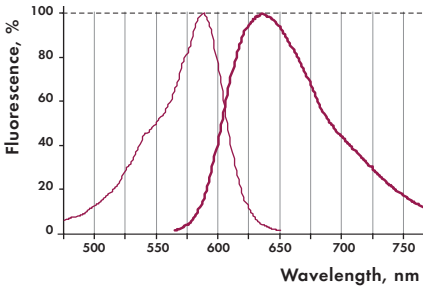
Main properties of TagFP635

Characteristic	
Molecular weight	27 kDa
Polypeptide length	237 aa
Fluorescence color	far-red
Excitation max	588 nm
Emission max	635 nm
Quantum yield	0.33
Extinction coefficient	45 000 $M^{-1}cm^{-1}$
Brightness*	14.9
Brightness % of EGFP	45
pKa	6.0
Structure	monomer
Aggregation	no
Maturation at 37°C	fast
Photostability	high

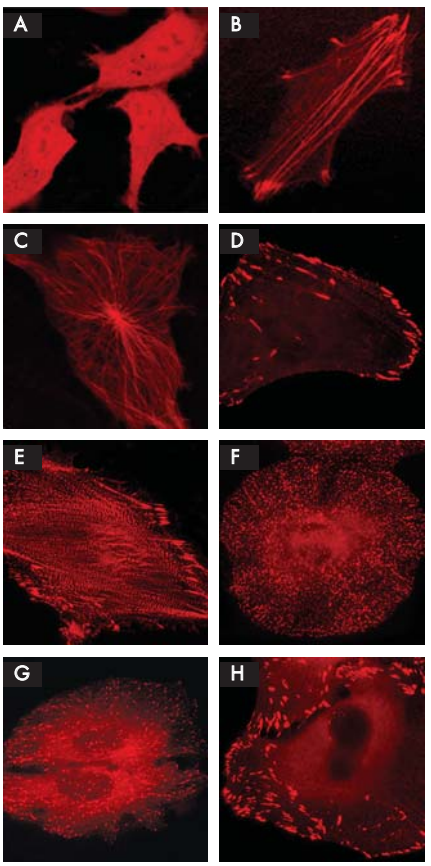
*Brightness is a product of extinction coefficient and quantum yield, divided by 1000.

Performance and use

TagFP635 is intended for protein labeling. Successful performance of TagFP635 in fusions has been demonstrated for many proteins. It can also be used for cell and organelle labeling and for tracking the promoter activity; however, TurboFP635 is preferable for these applications as it is brighter and more pH-stable than TagFP635.



TagFP635 normalized excitation (thin line) and emission (thick line) spectra.
Complete TagFP635 spectra in Excel format can be downloaded from the Evrogen Web site at www.evrogen.com/TagFP635.shtml



TagFP635 use for cell and protein labeling.
(A) — Whole-cell expression in transiently transfected Phoenix Eco cells; (B) — fusion with beta-actin in transiently transfected HeLa cells; (C) — fusion with alpha-tubulin in transiently transfected 3T3 cells; (D) — fusion with zyxin in transiently transfected HeLa cells; (E) — fusion with alpha-actinin in transiently transfected HeLa cells; (F) — fusion with clathrin in transiently transfected HeLa cells; (G) — fusion with end-binding protein 3 (EB3) in transiently transfected HeLa cells; (H) — fusion with vinculin in transiently transfected HeLa cells. Images A-C are from ref.1. Images D-H were kindly provided by Michael W. Davidson (Florida State University).

Application	Performance
Cell labeling	
mammalian cells	+++
bacterial cells	++++
Stable transfection	not tested
Promoter activity testing	+++
In fusions	++++

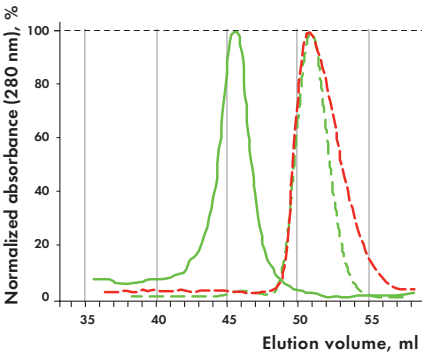
Compatibility with existing filter sets and antibodies

Recommended Omega Optical filter sets are QMAX-Red and XF102-2. TagFP635 can also be detected using Texas Red filter sets or similar. TagFP635 can be recognized using Anti-tRFP antibody (Cat.# AB231-AB232, page D-9) available from Evrogen.

TagFP635 licensing opportunities

Evrogen technology embodied in TagFP635 is available for expanded and commercial use with an adaptable licensing program. Benefits from flexible and market-driven license options are offered for upgrade and novel development of products and applications.

For licensing information, please contact Evrogen at license@evrogen.com.



Gel-filtration of TurboGFP (dimer, solid green line), EGFP (monomer, dashed green line), and TagFP635 (monomer, dashed red line) [1].

References

1. Shcherbo *et al.* (2007) Nat. Methods 4(9): 741-746.
2. Shaner *et al.* (2004) Nat. Biotechnol. 12: 1567-1572.

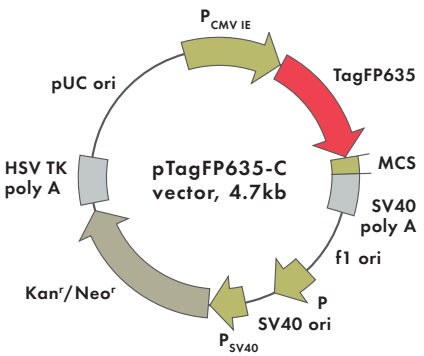
TagFP635-related products

TagFP635-related product line includes expression vectors, and antibodies. For updated product information, please visit the Evrogen Web site (www.evrogen.com/TagFP635.shtml).

Product	Cat.#	Description	Size	Page
TagFP635 expression/source vectors				
pTagFP635-C	FP161	Mammalian expression vector encoding humanized TagFP635 and allowing TagFP635 expression and generation of fusions to the TagFP635 C-terminus	20 µg	A-33
pTagF635P-N	FP162	Mammalian expression vector encoding humanized TagFP635 and allowing TagFP635 expression and generation of fusions to the TagFP635 N-terminus	20 µg	A-34
Antibodies against TagFP635				
Anti-tRFP antibody	AB231 AB232	Rabbit polyclonal antibody against TagRFP, TagFP635, TurboRFP, TurboFP602, and TurboFP635 proteins	100 µg 200 µg	D-9

Please contact your local distributor for exact prices and delivery information.

Expression/source vectors: pTagFP635-C



For vector sequence please visit our website at www.evrogen.com/pTagFP635-C.shtml

Product	Cat.#	Size
pTagFP635-C	**FP161**	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	mammalian expression vector
Reporter	TagFP635
Reporter codon usage	mammalian
Promoter for TagFP635	$P_{CMV\ IE}$
Host cells	mammalian
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	generation of fusions to the TagFP635 C-terminus; expression of TagFP635 or its fusions in mammalian cells

Multiple cloning site (MCS)

TagFP635 → BspE1 BglII SacI EcoRI SalI KpnI ApaI BamHI STOPs

TCC.GGA.CTC.AGA.TCT.CGA.GCT.CAA.GCT.TCG.AAT.TCT.GCA.GTC.GAC.GGT.ACC.GCG.GGC.CCG.GGA.TCC.ACC.GGA.TCT.AGA.TAA.CTG.ATC.A

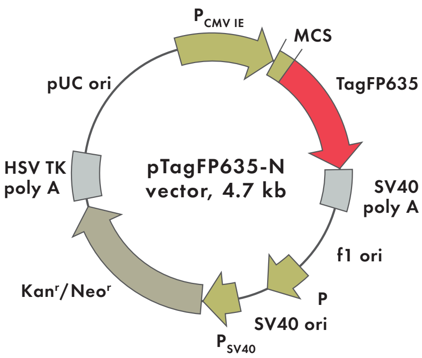
XhoI HindIII PstI SacII SmaI/XmaI XbaI# BclI#

— sites are blocked by methylation. If you wish to digest the vector using these sites, you will need to transform the vector into a dam$^-$ host and make fresh DNA.

Notice to Purchaser:
TagFP635-related products: These products are intended for research use only and covered by 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 (Appendix A, page G-5).
CMV Promoter: 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.

MATERIAL SAFETY DATA SHEET INFORMATION
ATTENTION: Safety Officer. EVROGEN JSC (Moscow, Russia) hereby confirms that to the best of our knowledge these products do not require a Material Safety Data Sheet. However, all of the properties of these products (and, if applicable, each of its components) have not been thoroughly investigated. Therefore, we recommend that you use gloves and eye protection and wear a laboratory coat when working with these products.

Expression/source vectors: pTagFP635-N



For vector sequence please visit our website at www.evrogen.com/pTagFP635-N.shtml

Product	Cat.#	Size
pTagFP635-N	**FP162**	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	mammalian expression vector
Reporter	TagFP635
Reporter codon usage	mammalian
Promoter for TagFP635	$P_{CMV\ IE}$
Host cells	mammalian
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	generation of fusions to the TagFP635 N-terminus; expression of TagFP635 or its fusions in mammalian cells

Multiple cloning site (MCS)

NheI, *BglII*, *SacI*, *HindIII*, *EcoRI*, *SalI*, *KpnI*, *ApaI*, *BamHI*, *AgeI*, TagFP635

G.CTA.GCG.CTA.CCG.GAC.TCA.GAT.CTC.GAG.CTC.AAG.CTT.CGA.ATT.CTG.CAG.TCG.ACG.GTA.CCG.CGG.GCC.CGG.GAT.CCA.CCG.GTC.GCC.ACC.ATG.G..

Eco47III, *XhoI*, *PstI*, *SacII*, *SmaI/XmaI*, *NcoI**

* — not unique sites.

Notice to Purchaser:
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CMV Promoter: 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.

MATERIAL SAFETY DATA SHEET INFORMATION
ATTENTION: Safety Officer. EVROGEN JSC (Moscow, Russia) hereby confirms that to the best of our knowledge these products do not require a Material Safety Data Sheet. However, all of the properties of these products (and, if applicable, each of its components) have not been thoroughly investigated. Therefore, we recommend that you use gloves and eye protection and wear a laboratory coat when working with these products.

TurboColors are proteins of different colors that are recommended for use in applications where fast appearance of bright fluorescence is crucial (e.g. for tracking the promoter activity), and for cell and organelle labeling.

TurboColors proteins available:

- green fluorescent protein TurboGFP

source — copepod *Pontellina plumata*

excitation max — 482 nm

emission max — 502 nm

- yellow fluorescent protein TurboYFP

source — jellyfish *Phialidium* sp.

excitation max — 525 nm

emission max — 538 nm

- red fluorescent protein TurboRFP

source — sea anemone *Entacmaea quadricolor*

excitation max — 553 nm

emission max — 574 nm

- true-red fluorescent protein TurboFP602

source — sea anemone *Entacmaea quadricolor*

excitation max — 574 nm

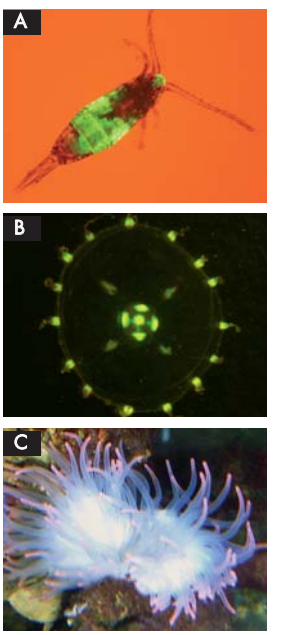
emission max — 602 nm

- far-red fluorescent protein TurboFP635

source — sea anemone *Entacmaea quadricolor*

excitation max — 588 nm

emission max — 635 nm



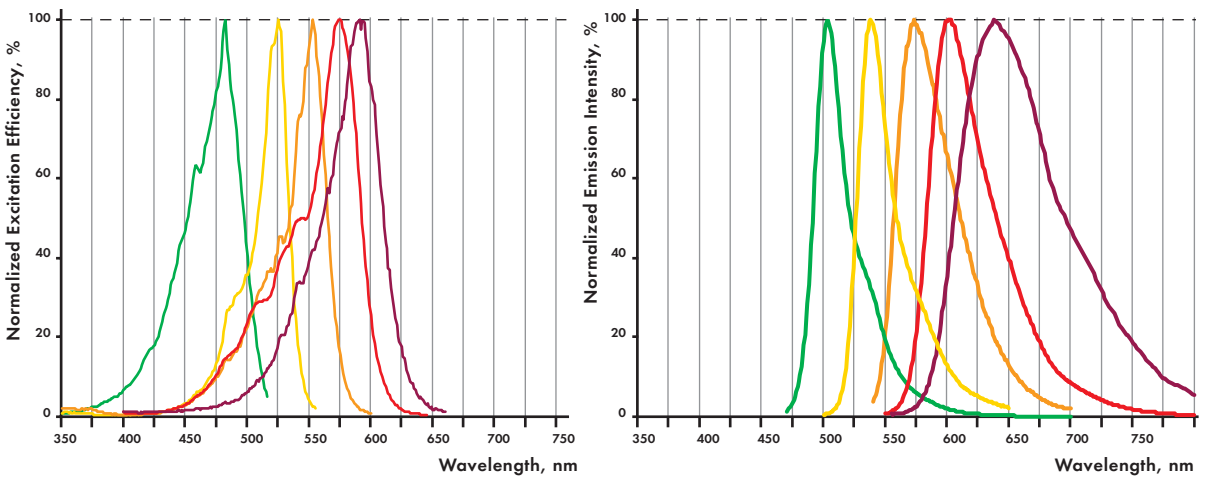
Marine organisms — sources of TurboColors proteins.
(A) — Planktonic copepod *Pontellina plumata*;
(B) — jellyfish *Phialidium* sp.;
(C) — sea anemone *Entacmaea quadricolor*.

Main properties of TurboColors:

Characteristic	TurboGFP	TurboYFP	TurboRFP	TurboFP602	TurboFP635
Fluorescence color	green	yellow	red (orange)	true-red	far-red
Excitation max	482 nm	525 nm	553 nm	574 nm	588 nm
Emission max	502 nm	538 nm	574 nm	602 nm	635 nm
Quantum yield	0.53	0.53	0.67	0.35	0.34
Extinction coefficient	70 000 $M^{-1}cm^{-1}$	105 000 $M^{-1}cm^{-1}$	92 000 $M^{-1}cm^{-1}$	74 400 $M^{-1}cm^{-1}$	65 000 $M^{-1}cm^{-1}$
Brightness	37.1	55.7	61.6	26.0	22.1
Brightness, % of EGFP	112	169	187	79	67
pKa	5.2	5.9	4.4	4.7	5.5
Structure	dimer	dimer	dimer	dimer	dimer
Cell Toxicity	not observed	at high concentrations	not observed	not observed	not observed
Aggregation	no	at high concentrations	no	no	no
Maturation at 37°C	superfast	superfast	superfast	fast	superfast
Photostabilyty	high	high	high	medium	high
Molecular weight	26 kDa	26 kDa	26 kDa	26 kDa	26 kDa
Main advantages	Bright and fast maturing green fluorescent protein	Bright and fast maturing true-yellow fluorescent protein	Bright and fast maturing red fluorescent protein	True-red fluorescent protein, ideal compatibility with popular filter sets	Far-red fluorescent protein, ideal for whole-body imaging
Possible limitations	Dimer, limited applicability for fusions generation	Dimer, limited applicability for fusions generation; can form aggregates at very high concentrations	Dimer, limited applicability for fusions generation	Dimer, limited applicability for fusions generation; medium photo-stability	Dimer, limited applicability for fusions generation

Brightness is a product of extinction coefficient and quantum yield, divided by 1000.

TurboColors, excitation/emission spectra



Characteristic	TurboGFP	TurboYFP	TurboRFP	TurboFP602	TurboFP635
Excitation					
Emission					

TurboGFP

- Bright green fluorescence
- Extra fast protein maturation
- Proven suitability to generate stably transfected cell lines
- Efficient maturation at a wide range of temperatures
- Destabilized version is available
- Recommended for gene expression analysis, cell and organelle labeling

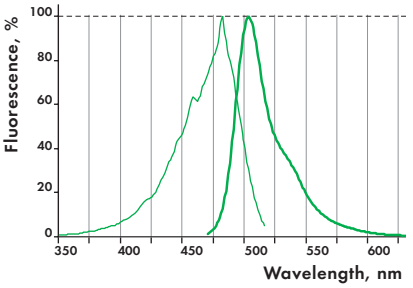
Protein description

TurboGFP is an improved variant of the green fluorescent protein CopGFP cloned from copepod *Pontellina plumata* (Arthropoda; Crustacea; Maxillopoda; Copepoda) [1]. TurboGFP possesses bright green fluorescence that is visible earlier than fluorescence of other green fluorescent proteins.

Main properties of TurboGFP

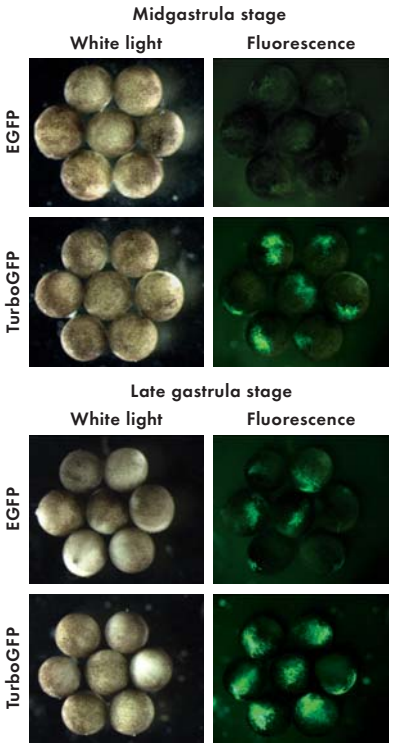
Characteristic	
Molecular weight	26 kDa
Polypeptide length	232 aa
Fluorescence color	green
Excitation max	482 nm
Emission max	502 nm
Quantum yield	0.53
Extinction coefficient	70 000 $M^{-1}cm^{-1}$
Brightness*	37.1
Brightness % of EGFP	112
pKa	5.2
Structure	dimer
Aggregation	no
Maturation at 37°C	superfast
Photostability	high

*Brightness is a product of extinction coefficient and quantum yield, divided by 1000.



TurboGFP normalized excitation (thin line) and emission (thick line) spectra.

Complete TurboGFP spectra in Excel format can be downloaded from the Evrogen Web site at www.evrogen.com/TurboGFP.shtml



***In vivo* comparison of TurboGFP and EGFP maturation in developing *Xenopus* embryos.**

Vectors expressing the respective fluorescent proteins under the control of CMV promoter were microinjected into animal poles of *Xenopus* embryos at the stage of two blastomeres. Living embryos were then photographed from the animal pole at the middle and late gastrula stages.
Experimental data were presented by Dr. A. Zaraisky, Institute of Bioorganic Chemistry, RAS (Moscow, Russia).

TurboGFP maturation kinetics

In vivo examination of developing *Xenopus* embryos microinjected with vectors comprising either TurboGFP or EGFP under the control of CMV promoter showed bright fluorescence of TurboGFP immediately after midblastula transition, when gene expression is activated. At the same time, EGFP was practically invisible at this developmental stage. This example clearly demonstrates that TurboGFP is a better tool to study expression in rapidly developing embryos at early stages.

In addition, *in vitro* comparison of TurboGFP refolding and maturation kinetics with that of other fluorescent proteins showed higher TurboGFP maturation rate.

Refolding and maturation kinetics of TurboGFP and other fluorescent proteins *in vitro*

Fluorescent protein	Refolding half-time (s)	Maturation half-time (s)	kox ($10^{-4}s^{-1}$)	Reference
EGFP	90.6	3915	1.77	[2]
Venus	46.2	4076	1.70	[3]
SYFP2	69.3	3300	2.10	[3]
TurboGFP	11.0	1468	4.72	[2]

Samples of fluorescent proteins were heated to 95°C in denaturation solution (8 M urea, 1 mM DTT) for 4 min. Refolding reactions were initiated upon 100-fold dilution into the renaturation buffer (35 mM KCl, 2 mM $MgCl_2$, 50 mM Tris, pH 7.5, 1 mM DTT). In maturation assay, 5 mM freshly dissolved dithionite was added to the denaturation solution [4]. Because of the instability of dithionite at high temperatures, to enable complete chromophore reduction, the sample was cooled to 25°C and the addition of 5 mM dithionite followed by heating to 95°C were repeated. Protein refolding and maturation were followed by measuring the recovery of fluorescence using Varian Cary Eclipse Fluorescence Spectrophotometer, with chamber temperature maintained at 25°C. Maturation rate constants (kox) were determined by computer-fitting the kinetic data to the first-order exponential decay (Origin 6.0).

Destabilized TurboGFP

Destabilized TurboGFP variant (TurboGFP-dest1) is produced by fusing the initial protein with PEST amino acid sequence encoded by region 422-461 of mouse ornithine decarboxylase gene [5]. This sequence targets the protein to degradation and enables a rapid protein turnover. TurboGFP-dest1 retains spectral properties of the initial protein, but has shorter half-life (approximately 2 hrs) as measured by the analysis of fluorescence intensity of cells treated with a protein synthesis inhibitor, cycloheximide. Because of rapid turnover, TurboGFP-dest1 can be used to measure changes in gene expression.

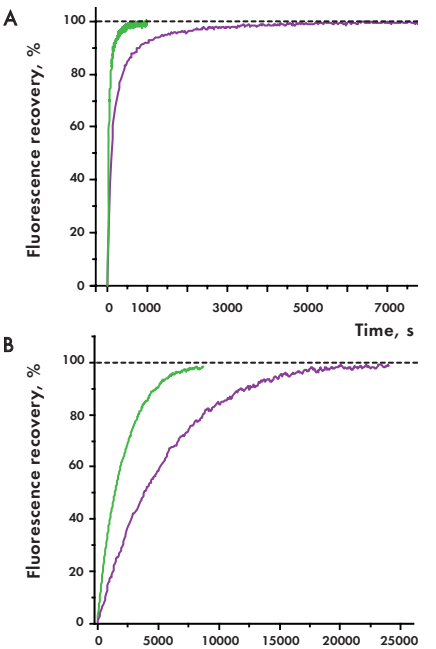
Performance and use

TurboGFP is mainly intended for applications where fast appearance of bright fluorescence is crucial. It is specially recommended for cell and organelle labeling and tracking the promoter activity.

Destabilized TurboGFP variant allows accurate analysis of rapid and/or transient events in gene regulation.

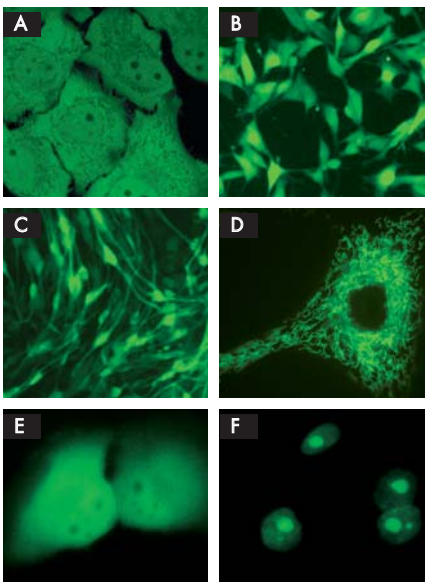
TurboGFP can be expressed and detected in a wide range of organisms. Suitability of the reporter for preparation of stably transfected cell lines expressing TurboGFP alone or in fusions has been shown.

Application	Performance
Cell labeling	
mammalian cells	++++
bacterial cells	++++
cold-blooded animals	++++
Stable transfection	proved
Promoter activity testing	++++
In fusions	++



Comparison of EGFP (violet lines) and TurboGFP (green lines) refolding and maturation speed *in vitro* [2].

Normalized fluorescence recovery plots are shown.
(A) — refolding kinetics;
(B) — chromophore maturation kinetics.



TurboGFP expression in mammalian cells.

(A) — Whole-cell expression in transiently transfected HeLa cells; (B) — in stably transfected M3 mouse melanoma cells; (C) — in stably transfected C2C12 mouse myoblast cells; (D) — mitochondrial TurboGFP expression in stably transfected HeLa cells; (E) — TurboGFP-BID fusion expression in transiently transfected HeLa cells; (F) — TurboGFP-fibrillarin expression in transiently transfected HeLa cells.
Photographs of stably transfected cell lines were provided by Dr. Christian Petzelt (Marinpharm).

Despite its dimeric structure, TurboGFP is suitable for generation of fusions; however, we recommend that you use specially optimized monomeric reporters for protein labeling applications. Please see section "Protein Localization Tags" (page A-5) to select a reporter for such purposes.

Compatibility with existing filter sets and antibodies

TurboGFP can be detected using common fluorescence filter sets for EGFP, FITC, and other green dyes. Recommended Omega Optical filter sets are QMAX-Green, XF100-2, XF100-3, XF115-2, and XF116-2.

Antibodies against TurboGFP (Cat.# AB511-AB514, see pages D-3 and D-4 for descriptions) are available from Evrogen.

TurboGFP licensing opportunities

Evrogen technology embodied in TurboGFP is available for expanded and commercial use with an adaptable licensing program. Benefits from flexible and market-driven license options are offered for upgrade and novel development of products and applications. For licensing information, please contact Evrogen at license@evrogen.com.

References

1. Shagin *et al.* (2004) Mol. Biol. Evol. 21(5): 841-850.
2. Evdokimov *et al.* (2006) EMBO Rep. 7(10): 1006-1012.
3. Kremers *et al.* (2006) Biochemistry 45: 6570-6580.
4. Reid and Flynn (1997) Biochemistry 36: 6786-6791.
5. Li *et al.* (1998) J. Biol. Chem. 273:34970-34975.

TurboGFP-related products

TurboGFP-related product line includes expression and source vectors, recombinant protein, and antibodies. For updated product information, please visit the Evrogen Web site (www.evrogen.com/TurboGFP.shtml).

Product	Cat.#	Description	Size	Page
TurboGFP expression/source vectors				
pTurboGFP-C	FP511	Mammalian expression vector encoding humanized TurboGFP and allowing its expression and generation of fusions to the TurboGFP C-terminus	20 µg	A-41
pTurboGFP-N	FP512	Mammalian expression vector encoding humanized TurboGFP and allowing its expression and generation of fusions to the TurboGFP N-terminus	20 µg	A-41
pTurboGFP-B	FP513	Bacterial expression vector; source of the humanized TurboGFP coding sequence	20 µg	A-42
pTurboGFP-PRL	FP515	Promoterless expression vector encoding humanized TurboGFP and designed for monitoring transcription from different promoters and promoter/enhancer combinations	20 µg	A-42
pTurboGFP-PRL-dest1	FP518	Promoterless vector encoding destabilized TurboGFP and designed for monitoring transcription from different promoters and promoter/enhancer combinations	20 µg	A-43
pTurboGFP-dest1	FP519	Mammalian expression vector encoding destabilized TurboGFP for its expression and generation of fusions to the TurboGFP-dest1 N-terminus	20 µg	A-43
pTurboGFP-mito	FP517	Mammalian expression vector encoding humanized TurboGFP targeted to mitochondria	20 µg	A-44
Gateway® TurboGFP-C	FP521	Gateway® entry clone for generation of fusions to the C-terminus of humanized TurboGFP; transfer of TurboGFP or TurboGFP-tagged fusion into a Gateway® destination vector	20 µg	A-44

Product	Cat.#	Description	Size	Page
Gateway® TurboGFP-N	FP522	Gateway® entry clone for generation of fusions to the N-terminus of humanized TurboGFP; transfer of TurboGFP or TurboGFP-tagged fusion into a Gateway® destination vector	20 µg	A-45
Recombinant protein				
rTurboGFP	FP552	Purified recombinant green fluorescent protein	100 µg	A-45
Antibodies against TurboGFP				
Anti-TurboGFP antibody	AB511 AB512	Rabbit polyclonal antibody against non-denatured TurboGFP	100 µg 200 µg	D-3
Anti-TurboGFP (d) antibody	AB513 AB514	Rabbit polyclonal antibody against denatured TurboGFP and CopGFP	100 µg 200 µg	D-4

Please contact your local distributor for exact prices and delivery information.

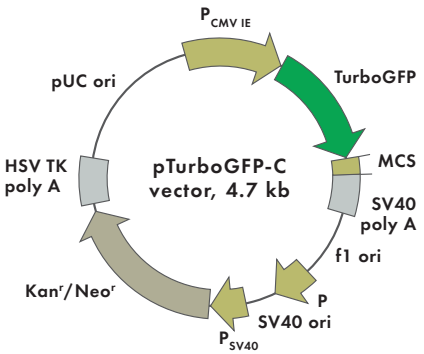
Third party products: stably transfected cell lines expressing TurboGFP

Cell line	Source	Description
M3-TG	mouse	M3 mouse melanoma cells expressing TurboGFP in cytosol
PC-TG	rat	PC-12 rat pheochromocytoma expressing TurboGFP in cytosol
CHO-K1-TG	hamster	Chinese hamster ovary cells CHO-K1 expressing TurboGFP in cytosol
H460-TG	human	H460 human lung carcinoma expressing TurboGFP in cytosol
Ut7-TG	human	UT7 human leukemia cells expressing TurboGFP in cytosol
H-TG	human	HeLa human cervical carcinoma expressing TurboGFP in cytosol
T24-TG	human	T24 human bladder carcinoma expressing TurboGFP in cytosol
C2-TG	mouse	C2C12 mouse myoblast cells expressing TurboGFP in cytosol
W-TG	rat	WALKER 256 rat tumor expressing TurboGFP in cytosol
3T3-TG	mouse	3T3 mouse fibroblasts expressing TurboGFP in cytosol
3T3-TG-D	mouse	T3 mouse fibroblasts expressing destabilized TurboGFP in cytosol
M3-TG-Mito	mouse	M3 mouse melanoma cells expressing TurboGFP in mitochondria
H-TG-Mito	human	HeLa human cervical carcinoma expressing TurboGFP in mitochondria
T24-TG-Mito	human	T24 human bladder carcinoma expressing TurboGFP in mitochondria
Fluorescent BID apoptotic protein	human	T24 human carcinoma cells expressing JRed in mitochondria and TurboGFP-BID fusion
HeLa-TurboGreen-Actin	human	HeLa human cervical carcinoma expressing TurboGFP fusion with beta-actin
Fluorescent fibrillarin	human	HeLa human cervical carcinoma expressing TurboGFP fusion with fibrillarin

Cell lines are manufactured by Marinpharm GmbH (Berlin, Germany) under the Evrogen license.

Notice to Purchaser:
TurboGFP-related products are intended for research use only and covered by 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 (Appendix A, page G-5).
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.
Invitrogen Gateway® Technology: please see Limited Use Label License No. 19: Gateway® Cloning Products, Appendix C, page G-7.

Expression/source vectors: pTurboGFP-C



For vector sequence please visit our Web site at www.evrogen.com/pTurboGFP-C.shtml

Product	Cat.#	Size
pTurboGFP-C	FP511	20 µg

Please contact your local distributor for exact prices and delivery information.

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	generation of fusions to the TurboGFP C-terminus; expression of TurboGFP or its fusions in mammalian cells

Multiple cloning site (MCS)

TurboGFP → *BglII* *SacI* *EcoRI* *SalI* *KpnI* *ApaI** *BamHI* *STOPs*

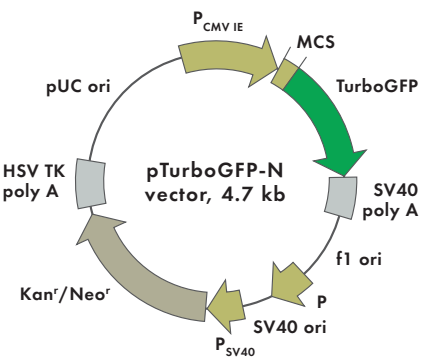
..AGA.TCT.CGA.GCT.CAA.GCT.TCG.AAT.TCT.GCA.GTC.GAC.GGT.ACC.GCG.GGC.CCG.GGA.TCC.ACC.GGA.TCT.AGA.TAA.CTG.ATC.A

XhoI *HindIII* *PstI** *SacII* *SmaI/XmaI* *XbaI#* *BclI#*

* — not unique sites;

— sites are blocked by methylation. If you wish to digest the vector using these sites, you will need to transform the vector into a dam⁻ host and make fresh DNA.

Expression/source vectors: pTurboGFP-N



For vector sequence please visit our Web site at www.evrogen.com/pTurboGFP-N.shtml

Product	Cat.#	Size
pTurboGFP-N	FP512	20 µg

Please contact your local distributor for exact prices and delivery information.

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	generation of fusions to the TurboGFP N-terminus; expression of TurboGFP or its fusions in mammalian cells

Multiple cloning site (MCS)

NheI *BglII* *SacI* *HindIII* *EcoRI* *SalI* *KpnI* *ApaI** *BamHI* *AgeI* TurboGFP →

G.CTA.GCG.CTA.CCG.GAC.TCA.GAT.CTC.GAG.CTC.AAG.CTT.CGA.ATT.CTG.CAG.TCG.ACG.GTA.CCG.CGG.GCC.CGG.GAT.CCA.CCG.GTC.GCC.ACC.ATG.G...

Eco47III *XhoI* *PstI** *SacII* *SmaI/XmaI* *NcoI**

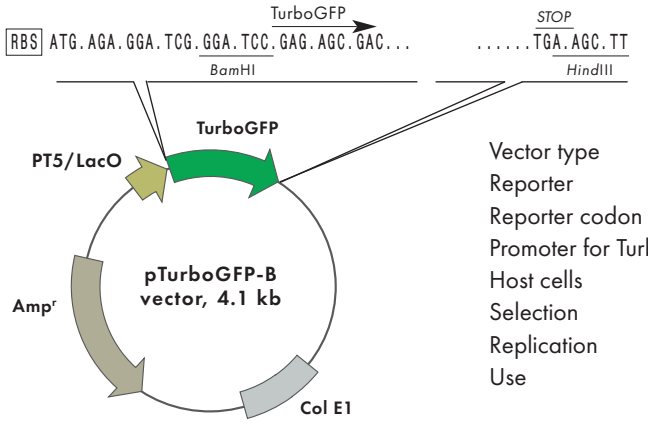
* — not unique sites.

Notice to Purchaser — please see page A-45

Expression/source vectors: pTurboGFP-B

Product	Cat.#	Size
pTurboGFP-B	FP513	20 µg

Please contact your local distributor for exact prices and delivery information.



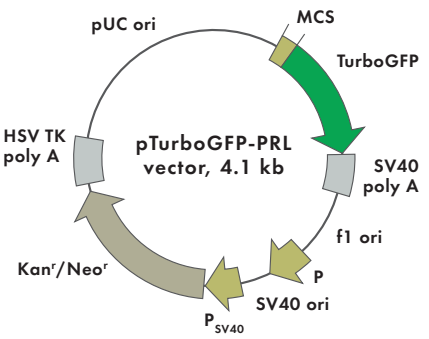
Vector type	bacterial expression vector
Reporter	TurboGFP
Reporter codon usage	mammalian
Promoter for TurboGFP	T5 promoter/lac operator
Host cells	prokaryotic
Selection	ampicillin
Replication	ColE1 ori
Use	TurboGFP expression in bacterial cells using T5 promoter/lac operator; source of the TurboGFP coding sequence

For vector sequence, please visit our Web site at www.evrogen.com/pTurboGFP-B.shtml

Expression/source vectors: pTurboGFP-PRL

Product	Cat.#	Size
pTurboGFP-PRL	FP515	20 µg

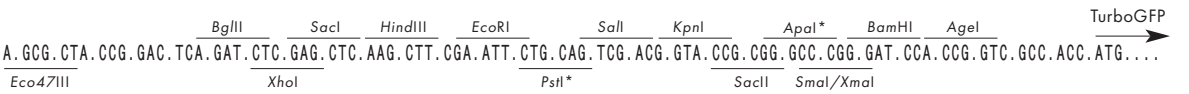
Please contact your local distributor for exact prices and delivery information.



Vector type	promoterless vector
Reporter	TurboGFP
Reporter codon usage	mammalian
Promoter for TurboGFP	NO
Host cells	mammalian, bacterial
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	monitoring the activity of promoter or promoter/enhancer combination of interest cloned into vector MCS

For vector sequence, please visit our Web site at www.evrogen.com/pTurboGFP-PRL.shtml

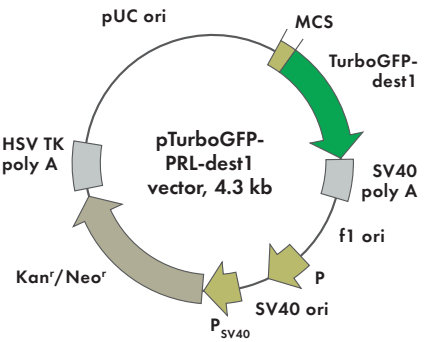
Multiple cloning site (MCS)



* — not unique sites.

Notice to Purchaser — please see page A-45

Expression/source vectors: pTurboGFP-PRL-dest1



For vector sequence, please visit our Web site at www.evrogen.com/pTurboGFP-PRL-dest1.shtml

Product	Cat.#	Size
pTurboGFP-PRL-dest1	FP518	20 µg

Please contact your local distributor for exact prices and delivery information.

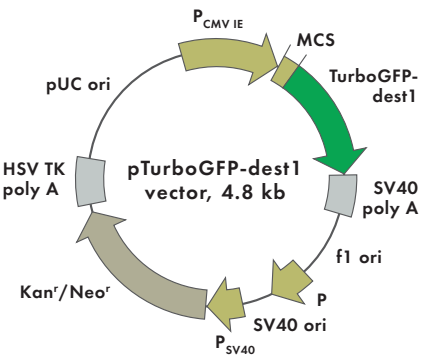
Vector type	promoterless vector
Reporter	destabilized TurboGFP (TurboGFP-dest1)
Reporter codon usage	mammalian
Promoter for TurboGFP-dest1	NO
Host cells	mammalian, prokaryotic
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	monitoring the activity of promoter or promoter/enhancer combination of interest cloned into vector MCS. Rapid turnover of TurboGFP-dest1 allows exact measuring of changes in gene expression

Multiple cloning site (MCS)

```
                                  BglII*    SacI     HindIII   EcoRI              SalI     KpnI              ApaI*    BamHI    AgeI                TurboGFP-dest1
A.GCG.CTA.CCG.GAC.TCA.GAT.CTC.GAG.CTC.AAG.CTT.CGA.ATT.CTG.CAG.TCG.ACG.GTA.CCG.CGG.GCC.CGG.GAT.CCA.CCG.GTC.GCC.ACC.ATG.G..
Eco47III            XhoI*                          PstI*                SacII    SmaI/XmaI                   NcoI*
```

* — not unique sites.

Expression/source vectors: pTurboGFP-dest1



For vector sequence, please visit our Web site at www.evrogen.com/pTurboGFP-dest1.shtml

Product	Cat.#	Size
pTurboGFP-dest1	FP519	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	mammalian expression vector
Reporter	destabilized TurboGFP (TurboGFP-dest1)
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	generation of fusions to the TurboGFP-dest1 N-terminus; expression of TurboGFP-dest1 or its fusions in mammalian cells; positive control for the pTurboGFP-PRL-dest1 vector (Cat.# FP518)

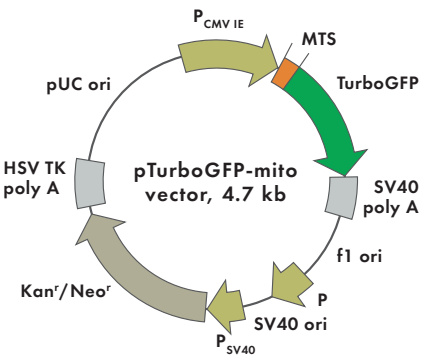
Multiple cloning site (MCS)

```
          NheI                BglII*    SacI     HindIII   EcoRI              SalI     KpnI              ApaI*    BamHI    AgeI                TurboGFP-dest1
G.CTA.GCG.CTA.CCG.GAC.TCA.GAT.CTC.GAG.CTC.AAG.CTT.CGA.ATT.CTG.CAG.TCG.ACG.GTA.CCG.CGG.GCC.CGG.GAT.CCA.CCG.GTC.GCC.ACC.ATG.G..
  Eco47III            XhoI*                          PstI*                SacII    SmaI/XmaI                   NcoI*
```

* — not unique sites.

Notice to Purchaser — please see page A-45

Expression/source vectors: pTurboGFP-mito



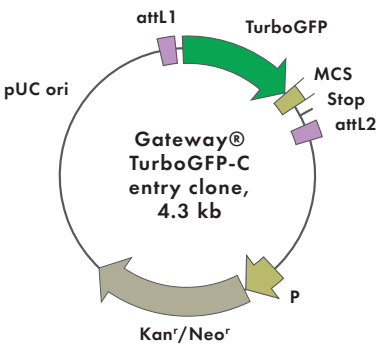
For vector sequence, please visit our Web site at www.evrogen.com/pTurboGFP-mito.shtml

Product	Cat.#	Size
pTurboGFP-mito	**FP517**	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	mammalian expression vector
Reporter	TurboGFP fusion with mitochondrial targeting sequence (MTS) derived from the subunit VIII of human cytochrome C oxidase
Reporter codon usage	mammalian
Promoter for TurboGFP-MTS	$P_{CMV\ IE}$
Host cells	mammalian
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	expression of mitochondria-targeted TurboGFP in mammalian cells under the control of CMV promoter; source of mitochondria-targeted TurboGFP coding sequence

Expression/source vectors: Gateway® TurboGFP-C entry clone



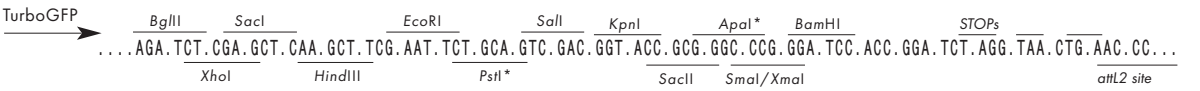
For vector sequence, please visit our Web site at www.evrogen.com/gwTurboGFP-C.shtml

Product	Cat.#	Size
Gateway® TurboGFP-C entry clone	**FP521**	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	Gateway® entry clone
Reporter	TurboGFP
Reporter codon usage	mammalian
Promoter for TurboGFP	NO
Host cells	prokaryotic
Selection	kanamycin
Replication	prokaryotic — pUC ori
Use	generation of fusions to the N-terminus of TurboGFP using attL1 site; generation of fusions to the C-terminus of TurboGFP using vector MCS; fast cloning into Gateway® expression vectors through site-specific recombination

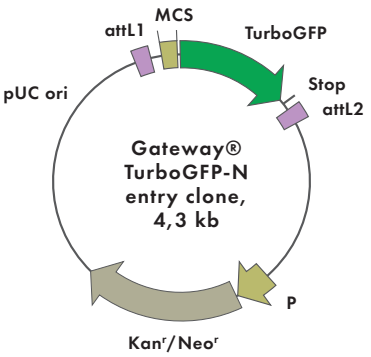
Multiple cloning site (MCS)



* — not unique sites

Notice to Purchaser — please see page A-45

Expression/source vectors: Gateway® TurboGFP-N entry clone



For vector sequence, please visit our Web site at www.evrogen.com/gwTurboGFP-N.shtml

Product	Cat.#	Size
Gateway® TurboGFP-N entry clone	FP522	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	Gateway® entry clone
Reporter	TurboGFP
Reporter codon usage	mammalian
Promoter for TurboGFP	NO
Host cells	prokaryotic
Selection	kanamycin
Replication	prokaryotic — pUC ori
Use	generation of fusions to the N-terminus of TurboGFP using attL1 site or vector MCS; fast cloning into Gateway® expression vectors through site-specific recombination

Multiple cloning site (MCS)

attL1 site — *BglII* — *SacI* — *HindIII* — *EcoRI* — *SalI* — *KpnI* — *ApaI** — *BamHI* — *AgeI* — TurboGFP

AGG.CTG.CTA.GCG.CTA.CCG.GAC.TCA.GAT.CTC.GAG.CTC.AAG.CTT.CGA.ATT.CTG.CAG.TCG.ACG.GTA.CCG.CGG.GCC.CGG.GAT.CCA.CCG.GTC.GCC.ACC.ATG...

Eco47III — *XhoI* — *PstI** — *SacII* — *SmaI/XmaI*

* — not unique sites

Recombinant protein rTurboGFP

Product	Cat.#	Size
rTurboGFP	FP552	100 µg

Please contact your local distributor for exact prices and delivery information.

Use

- Standard on protein gels and Western blots
- Control for fluorescence microscopy
- Calibration of fluorimeters and FACS machines
- Microinjection into cells and tissues

Description

Recombinant TurboGFP (rTurboGFP) is 26-kDa green fluorescent protein. It has excitation and emission spectra identical to those of the expressed TurboGFP. rTurboGFP is suitable as control reagent for TurboGFP expression using the TurboGFP expression vectors. rTurboGFP is purified from transformed *E. coli* using organic extraction and hydrophobic chromatography or metal-ion affinity chromatography (methods vary for different lots). Both methods ensure high purity of the recombinant protein and maintenance of fluorescence. The protein concentration is measured by chromophore absorption. rTurboGFP may contain 6xHis tag at its N-terminus (vary in different lots).

Notice to Purchaser:
TurboGFP-related products: These products are intended for research use only and covered by 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 (Appendix A, page G-5).
CMV Promoter: 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.
Invitrogen Gateway® Technology: please see Limited Use Label License No. 19: Gateway® Cloning Products, Appendix C, page G-7.

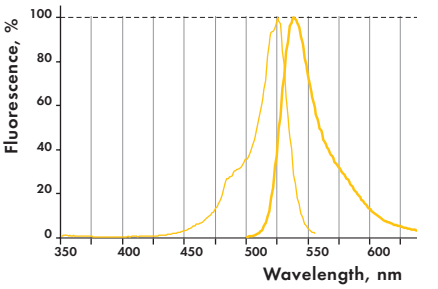
MATERIAL SAFETY DATA SHEET INFORMATION
To the best of our knowledge, these products do not require a Material Safety Data Sheet. However, all the properties of these products (and, if applicable, each of their components) have not been thoroughly investigated. Therefore, we recommend that you use gloves and eye protection, and wear a laboratory coat when working with these products.

TurboYFP

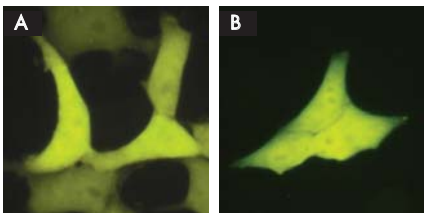
- Superbright true-yellow fluorescence
- Fast maturation
- Emission wavelength is ideally positioned between those of green and red fluorescent proteins
- Destabilized version is available
- Recommended for gene expression analysis and cell labeling

Protein description

TurboYFP is an enhanced variant of the yellow fluorescent protein PhiYFP from jellyfish *Phialidium* sp. [1]. Possessing superbright yellow fluorescence with emission maximum at 538 nm, TurboYFP is ideally positioned between green and red fluorescent proteins, allowing easy separation of these fluorescent markers by flow cytometry using common channels of detection and a single laser excitation line. Compared with PhiYFP, TurboYFP matures faster in mammalian cells.



TurboYFP normalized excitation (thin line) and emission (thick line) spectra.
Complete TurboYFP spectra in Excel format can be downloaded from the Evrogen Web site at www.evrogen.com/TurboYFP.shtml



TurboYFP expression in mammalian cells.
(A) — Whole-cell expression in Phoenix cells;
(B) — whole-cell expression in HeLa cells.

Main properties of TurboYFP

Characteristic	
Molecular weight	26 kDa
Polypeptide length	234 aa
Fluorescence color	yellow
Excitation max	525 nm
Emission max	538 nm
Quantum yield	0.53
Extinction coefficient	105 000 $M^{-1}cm^{-1}$
Brightness*	55.7
Brightness % of EGFP	169
pKa	5.9
Structure	dimer
Aggregation	at high concentration
Maturation at 37°C	superfast
Photostability	high

*Brightness is a product of extinction coefficient and quantum yield, divided by 1000.

Destabilized TurboYFP

Destabilized TurboYFP variant (TurboYFP-dest1) is produced by fusing the initial protein with PEST amino acid sequence encoded by region 422-461 of mouse ornithine decarboxylase gene [2]. This sequence targets the protein to degradation and enables a rapid protein turnover. TurboYFP-dest1 retains spectral properties of the initial protein, but has shorter half-lives (approximately 1.5-2 hrs) as measured by the analysis of fluorescence intensity of cells treated with a protein synthesis inhibitor, cycloheximide. Because of rapid turnover, TurboYFP-dest1 can be used to measure

Performance and use

TurboYFP is mainly intended for applications where fast appearance of bright fluorescence is crucial. It is specially recommended for cell labeling and tracking the promoter activity.

Application	Performance
Cell labeling	
mammalian cells	++++
bacterial cells	++++
Stable transfection	not tested
Promoter activity testing	++++
In fusions	++

TurboYFP can be expressed and detected in a wide range of organisms. Mammalian cells transiently transfected with TurboYFP expression vectors give bright fluorescent signals within 8-10 hrs after transfection.

Being overexpressed in long-term culture of cells with high expression levels, TurboYFP shows slight tendency to aggregate. It might limit TurboYFP use in such experimental systems. Please use PhiYFP proteins (see description at A-71 page) for stable expression and for organelle labeling.

Despite its dimeric structure, TurboYFP demonstrates successful performance in fusions with subcellular localization signals and many cellular proteins, e.g. with fibrillarin, Bid protein, beta-actin. However, generally we do not recommend using TurboYFP for fusion with oligomerizing cellular proteins (e.g. tubulin). Please see section "Protein Localization Tags" (page A-5) to select a reporter for such purposes.

Compatibility with existing filter sets and antibodies

TurboYFP can be detected using Omega Optical filter set XF104-3 or Chroma Technology corporation filter set 42003 ("ZsYellow1").

TurboYFP can be recognized using Anti-PhiYFP and Anti-PhiYFP(d) antibodies (Cat.# AB601-AB604, see pages D-7 and D-8 for descriptions) available from Evrogen.

TurboYFP licensing opportunities

Evrogen technology embodied in TurboYFP is available for expanded and commercial use with an adaptable licensing program. Benefits from flexible and market-driven license options are offered for upgrade and novel development of products and applications.

For licensing information, please contact Evrogen at license@evrogen.com.

References

1. Shagin *et al.* (2004) Mol. Biol. Evol. 21(5): 841-850.
2. Li *et al.* (1998) J. Biol. Chem. 273:34970-34975.

TurboYFP-related products

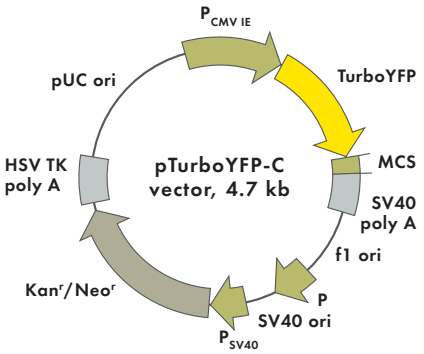
TurboYFP-related product line includes expression and source vectors, recombinant protein, and antibodies. For updated product information, please visit the Evrogen Web site (www.evrogen.com/TurboYFP.shtml).

Product	Cat.#	Description	Size	Page
TurboYFP expression/source vectors				
pTurboYFP-C	FP611	Mammalian expression vector encoding humanized TurboYFP and allowing TurboYFP expression and generation of fusions to the TurboYFP C-terminus	20 µg	A-49
pTurboYFP-N	FP612	Mammalian expression vector encoding humanized TurboYFP and allowing TurboYFP expression and generation of fusions to the TurboYFP N-terminus	20 µg	A-49
pTurboYFP-B	FP613	Bacterial expression vector; source of the humanized TurboYFP coding sequence	20 µg	A-50
pTurboYFP-PRL	FP615	Promoterless expression vector encoding humanized TurboYFP and designed for monitoring transcription from different promoters and promoter/enhancer combinations	20 µg	A-50
pTurboYFP-PRL-dest1	FP618	Promoterless vector encoding destabilized TurboYFP and designed for monitoring transcription from different promoters and promoter/enhancer combinations	20 µg	A-51
pTurboYFP-dest1	FP619	Mammalian expression vector encoding destabilized TurboYFP for its expression and generation of fusions to the TurboYFP-dest1 N-terminus	20 µg	A-51
Recombinant protein				
rTurboYFP	FP652	Purified recombinant yellow fluorescent protein	100 µg	A-52
Antibodies against TurboYFP				
Anti-PhiYFP antibody	AB601 AB602	Rabbit polyclonal antibody against non-denatured PhiYFP, PhiYFP-m, and TurboYFP	100 µg 200 µg	D-7
Anti-PhiYFP(d) antibody	AB603 AB604	Rabbit polyclonal antibody against denatured PhiYFP, PhiYFP-m, and TurboYFP	100 µg 200 µg	D-8

Please contact your local distributor for exact prices and delivery information.

Notice to Purchaser:
TurboYFP-related products: These products are intended for research use only and covered by 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 (Appendix A, page G-5).
CMV Promoter: 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.

Expression/source vectors: pTurboYFP-C



For vector sequence, please visit our Web site at www.evrogen.com/pTurboYFP-C.shtml

Product	Cat.#	Size
pTurboYFP-C	FP611	20 µg

Please contact your local distributor for exact prices and delivery information.

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

Multiple cloning site (MCS)

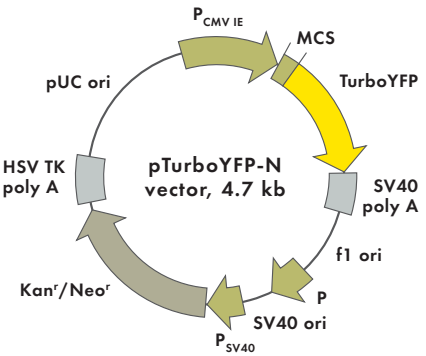
TurboYFP → *BglII* *SacI* *EcoRI* *SalI* *KpnI* *ApaI* *BamHI* *STOPs*

..AGA.TCT.CGA.GCT.CAA.GCT.TCG.AAT.TCT.GCA.GTC.GAC.GGT.ACC.GCG.GGC.CCG.GGA.TCC.ACC.GGA.TCT.AGA.TAA.CTG.ATC.A

XhoI *HindIII* *PstI* *SacII** *SmaI/XmaI* *XbaI#* *BclI#*

* — not unique sites;
# — sites are blocked by methylation. If you wish to digest the vector using these sites, you will need to transform the vector into a dam- host and make fresh DNA.

Expression/source vectors: pTurboYFP-N



For vector sequence, please visit our Web site at www.evrogen.com/pTurboYFP-N.shtml

Product	Cat.#	Size
pTurboYFP-N	FP612	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	mammalian expression vector
Reporter	TurboYFP
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	generation of fusions to the TurboYFP C-terminus; expression of TurboYFP or its fusions in mammalian cells

Multiple cloning site (MCS)

NheI *BglII* *SacI* *HindIII* *EcoRI* *SalI* *KpnI* *ApaI* *BamHI* *AgeI* TurboYFP →

G.CTA.GCG.CTA.CCG.GAC.TCA.GAT.CTC.GAG.CTC.AAG.CTT.CGA.ATT.CTG.CAG.TCG.ACG.GTA.CCG.CGG.GCC.CGG.GAT.CCA.CCG.GTC.GCC.ACC.ATG....

Eco47III *XhoI* *PstI* *SacII** *SmaI/XmaI*

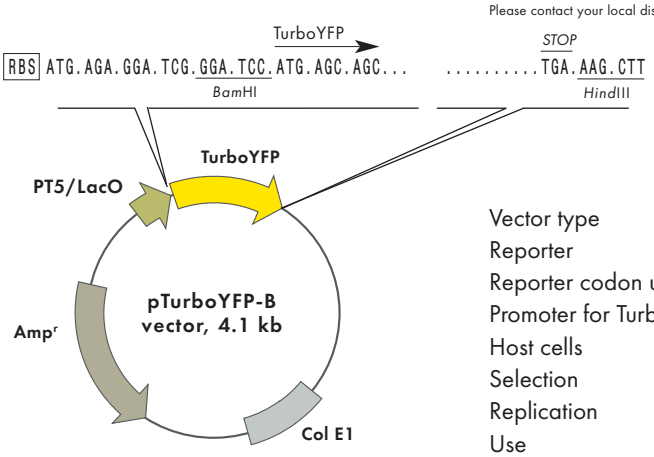
* — not unique sites.

Notice to Purchaser — please see page A-52

Expression/source vectors: pTurboYFP-B

Product	Cat.#	Size
pTurboYFP-B	FP613	20 µg

Please contact your local distributor for exact prices and delivery information.



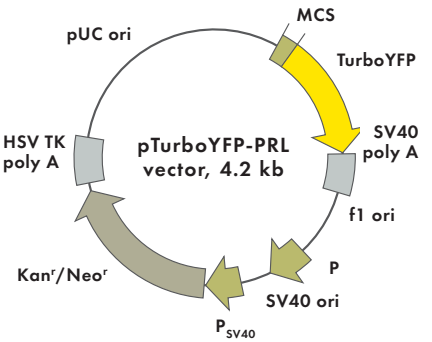
For vector sequence, please visit our Web site at www.evrogen.com/pTurboYFP-B.shtml

Vector type	bacterial expression vector
Reporter	TurboYFP
Reporter codon usage	mammalian
Promoter for TurboYFP	T5 promoter/lac operator
Host cells	prokaryotic
Selection	ampicillin
Replication	ColE1 ori
Use	TurboYFP expression in bacterial cells using T5 promoter/lac operator; source of the TurboYFP coding sequence

Expression/source vectors: pTurboYFP-PRL

Product	Cat.#	Size
pTurboYFP-PRL	FP615	20 µg

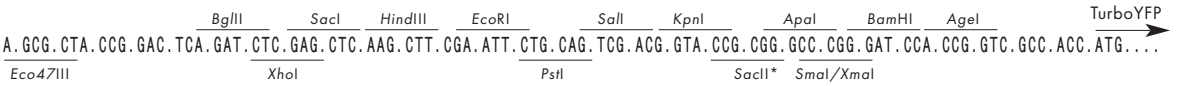
Please contact your local distributor for exact prices and delivery information.



For vector sequence, please visit our Web site at www.evrogen.com/pTurboYFP-PRL.shtml

Vector type	promoterless vector
Reporter	TurboYFP
Reporter codon usage	mammalian
Promoter for TurboGFP	NO
Host cells	mammalian, bacterial
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	monitoring the activity of promoter or promoter/enhancer combination cloned into vector MCS

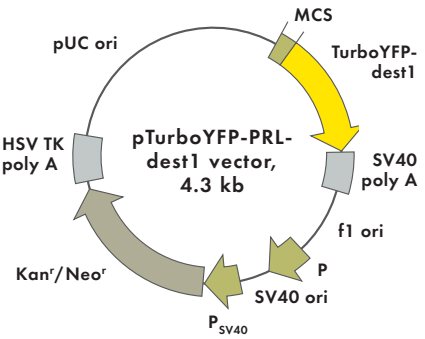
Multiple cloning site (MCS)



* — not unique sites.

Notice to Purchaser — please see page A-52

Expression/source vectors: pTurboYFP-PRL-dest1



For vector sequence, please visit our Web site at www.evrogen.com/pTurboYFP-PRL-dest1.shtml

Product	Cat.#	Size
pTurboYFP-PRL-dest1	FP618	20 µg

Please contact your local distributor for exact prices and delivery information.

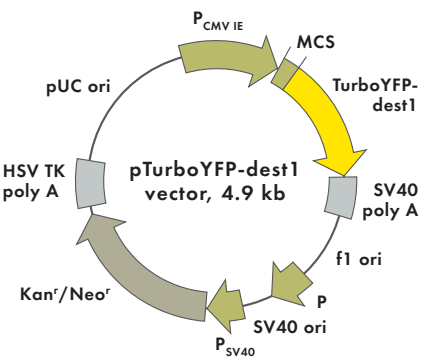
Vector type	promoterless vector
Reporter	destabilized TurboYFP (TurboYFP-dest1)
Reporter codon usage	mammalian
Promoter for TurboYFP-dest1	NO
Host cells	mammalian, bacterial
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	monitoring the activity of promoter or promoter/enhancer combination cloned into vector MCS. Rapid turnover of TurboYFP-dest1 allows exact measuring of changes in gene expression

Multiple cloning site (MCS)

```
                                  BglII*  SacI  HindIII  EcoRI      SalI  KpnI      ApaI  BamHI  AgeI                TurboYFP-dest1
A.GCG.CTA.CCG.GAC.TCA.GAT.CTC.GAG.CTC.AAG.CTT.CGA.ATT.CTG.CAG.TCG.ACG.GTA.CCG.CGG.GCC.CGG.GAT.CCA.CCG.GTC.GCC.ACC.ATG....
Eco47III          XhoI                      PstI*                 SacII* SmaI/XmaI
```

* — not unique sites.

Expression/source vectors: pTurboYFP-dest1



For vector sequence, please visit our Web site at www.evrogen.com/pTurboYFP-dest1.shtml

Product	Cat.#	Size
pTurboYFP-dest1	FP619	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	mammalian expression vector
Reporter	destabilized TurboYFP (TurboYFP-dest1)
Reporter codon usage	mammalian
Promoter for TurboYFP-dest1	$P_{CMV\ IE}$
Host cells	mammalian
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	generation of fusions to the TurboYFP-dest1 N-terminus; expression of TurboYFP-dest1 or its fusions in mammalian cells; positive control for the pTurboYFP-PRL-dest1 vector (Cat.# FP618)

Multiple cloning site (MCS)

```
 NheI                BglII*  SacI  HindIII  EcoRI      SalI  KpnI      ApaI  BamHI  AgeI                TurboYFP-dest1
G.CTA.GCG.CTA.CCG.GAC.TCA.GAT.CTC.GAG.CTC.AAG.CTT.CGA.ATT.CTG.CAG.TCG.ACG.GTA.CCG.CGG.GCC.CGG.GAT.CCA.CCG.GTC.GCC.ACC.ATG....
  Eco47III          XhoI                      PstI*                 SacII* SmaI/XmaI
```

* — not unique sites.

Notice to Purchaser — please see page A-52

Recombinant protein rTurboYFP

Product	Cat.#	Size
rTurboYFP	**FP652**	100 µg

Please contact your local distributor for exact prices and delivery information.

Use

- Standard on protein gels and Western blots
- Control for fluorescence microscopy
- Calibration of fluorimeters and FACS machines
- Microinjection into cells and tissues

Description

Recombinant TurboYFP (rTurboYFP) is 26-kDa yellow fluorescent protein. It has excitation and emission spectra identical to those of the expressed TurboYFP. rTurboYFP is suitable as control reagent for TurboYFP expression using the TurboYFP expression vectors.

rTurboYFP is purified from transformed *E. coli* using organic extraction and hydrophobic chromatography or metal-ion affinity chromatography (methods vary for different lots). Both methods ensure high purity of the recombinant protein and maintenance of fluorescence. The protein concentration is measured by chromophore absorption. rTurboYFP may contain 6xHis tag at its N-terminus (vary in different lots).

MATERIAL SAFETY DATA SHEET INFORMATION
To the best of our knowledge, these products do not require a Material Safety Data Sheet. However, all the properties of these products (and, if applicable, each of their components) have not been thoroughly investigated. Therefore, we recommend that you use gloves and eye protection, and wear a laboratory coat when working with these products.

TurboRFP

- Superbright red (orange) fluorescence
- Fast maturation
- Fluorescent signal is easily distinguished from background fluorescence
- Destabilized version is available
- Recommended for gene expression analysis, cell and organelle labeling

Protein description

TurboRFP is a novel red fluorescent protein (excitation/emission maxima are 553 and 574 nm, respectively) derived from sea anemone *Entacmaea quadricolor* [1]. Possessing high photostability and pH stability, TurboRFP is more than twice brighter than DsRed2. Fast TurboRFP maturation makes it clearly detectable in mammalian cells as early as within 8-10 hrs after transfection.

Main properties of TurboRFP

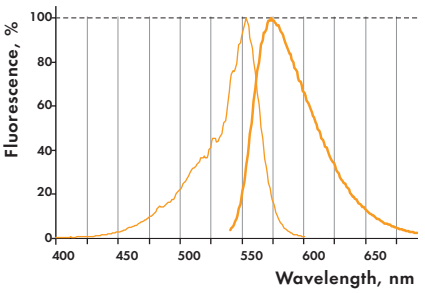
Characteristic	
Molecular weight	26 kDa
Polypeptide length	231 aa
Fluorescence color	red (orange)
Excitation max	553 nm
Emission max	574 nm
Quantum yield	0.67
Extinction coefficient	92 000 $M^{-1}cm^{-1}$
Brightness*	61.6
Brightness % of EGFP	187
pKa	4.4
Structure	dimer
Aggregation	no
Maturation at 37°C	superfast
Photostability	high

*Brightness is a product of extinction coefficient and quantum yield, divided by 1000.

Comparison of TurboRFP, DsRed2, and DsRed-Express maturation in mammalian cells

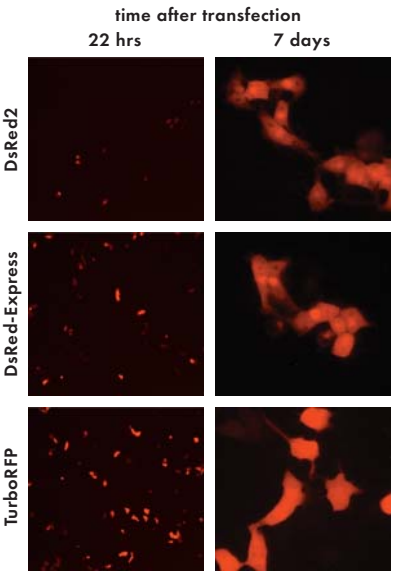
HeLa cells were transiently transfected with mammalian expression vectors comprising TurboRFP, DsRed2, or DsRed-Express fluorescent proteins under the control of CMV promoter. The DNA concentrations were equalized before transfection. Cells were photographed using fluorescent microscope after different periods of cultivation.

Faster appearance of bright fluorescence was detected in the case of TurboRFP. In addition, unlike DsRed-related proteins, no abnormal Golgi-like localization of TurboRFP was observed within 7 days after transfection.



TurboRFP normalized excitation (thin line) and emission (thick line) spectra.

Complete TurboRFP spectra in Excel format can be downloaded from the Evrogen Web site at www.evrogen.com/TurboRFP.shtml



Fluorescent microscopy of mammalian cells expressing DsRed2, DsRed-Express, and TurboRFP.

TurboRFP gives the brightest signal 22 hrs after transfection;
DsRed2 and DsRed-Express show abnormal Golgi-like localization 7 days after transfection, whereas TurboRFP localizes evenly in cytosol.

Destabilized TurboRFP

Destabilized TurboRFP variant (TurboRFP-dest1) is produced by fusing the initial protein with PEST amino acid sequence encoded by region 422-461 of mouse ornithine decarboxylase gene [2]. This sequence targets the protein to degradation and enables a rapid protein turnover. TurboRFP-dest1 retains spectral properties of the initial protein, but has shorter half-life (approximately 1-2 hrs) as measured by the analysis of fluorescence intensity of cells treated with a protein synthesis inhibitor, cycloheximide. Because of rapid turnover, TurboRFP-dest1 can be used to measure changes in gene expression.

Performance and use

TurboRFP is mainly intended for applications where fast appearance of bright fluorescence is crucial. It is specially recommended for cell and organelle labeling and tracking the promoter activity.

Application	Performance
Cell labeling	
mammalian cells	++++
bacterial cells	++++
Stable transfection	not tested
Promoter activity testing	++++
In fusions	++

TurboRFP can be expressed and detected in a wide range of organisms. Mammalian cells transiently transfected with TurboRFP expression vectors give bright fluorescent signals within 8-10 hrs after transfection. No cell toxic effects are observed

Despite its dimeric structure, TurboRFP demonstrates successful performance in fusions with subcellular localization signals and many cellular proteins. However, we do not recommend using TurboRFP for fusion with oligomerizing cellular proteins (e.g. alpha-tubulin). Please see section "Protein Localization Tags" to select a reporter for such purposes.

Compatibility with existing filter sets and antibodies

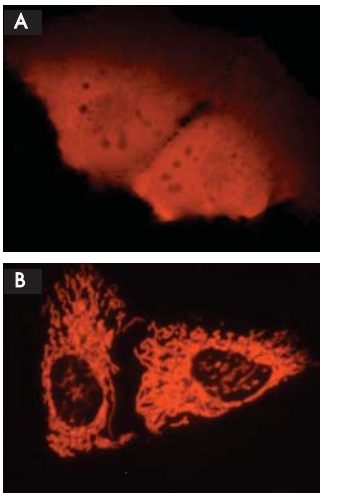
Recommended Omega Optical filter sets are QMAX-Yellow, XF108-2, XF101-2, and XF111-2. TurboRFP can also be detected using TRITC filter set or similar.

TurboRFP can be recognized using Anti-tRFP antibody (Cat.# AB231-AB232, page D-9) available from Evrogen.

TurboRFP licensing opportunities

Evrogen technology embodied in TurboRFP is available for expanded and commercial use with an adaptable licensing program. Benefits from flexible and market-driven license options are offered for upgrade and novel development of products and applications.

For licensing information, please contact Evrogen at license@evrogen.com.



TurboRFP use for cell and organelle labeling.
(A) — Fluorescent microscopy of mammalian cells expressing cytoplasmic TurboRFP;
(B) — fluorescent microscopy of mammalian cells expressing TurboRFP fusion with mitochondrial targeting signal. Images made from HeLa cells 24 hrs after transfection.

References

1. Merzlyak *et al.* (2007) Nat. Methods. 4(7): 555-557.
2. Li *et al.* (1998) J. Biol. Chem. 273:34970-34975.

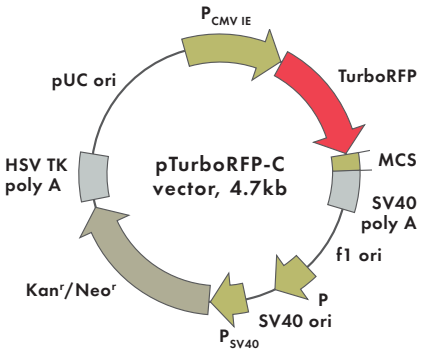
TurboRFP-related products

TurboRFP-related product line includes expression and source vectors, recombinant protein, and antibodies. For updated product information, please visit the Evrogen Web site (www.evrogen.com/TurboRFP.shtml).

Product	Cat.#	Description	Size	Page
TurboRFP expression/source vectors				
pTurboRFP-C	FP231	Mammalian expression vector encoding humanized TurboRFP and allowing TurboRFP expression and generation of fusions to the TurboRFP C-terminus	20 µg	A-56
pTurboRFP-N	FP232	Mammalian expression vector encoding humanized TurboRFP and allowing TurboRFP expression and generation of fusions to the TurboRFP N-terminus	20 µg	A-56
pTurboRFP-B	FP233	Bacterial expression vector; source of humanized TurboRFP coding sequence	20 µg	A-57
pTurboRFP-PRL	FP235	Promoterless mammalian expression vector encoding humanized TurboRFP and designed for monitoring transcription from different promoters and promoter/enhancer combinations	20 µg	A-57
pTurboRFP-PRL-dest1	FP238	Promoterless vector encoding destabilized TurboRFP and designed for monitoring transcription from different promoters and promoter/enhancer combinations	20 µg	A-58
pTurboRFP-dest1	FP239	Mammalian expression vector encoding destabilized TurboRFP for its expression and generation of fusions to the TurboRFP-dest1 N-terminus	20 µg	A-58
pTurboRFP-mito	FP237	Mammalian expression vector encoding humanized TurboRFP targeted to mitochondria	20 µg	A-59
Recombinant protein				
rTurboRFP	FP252	Recombinant red fluorescent protein TurboRFP	100 µg	A-59
Antibodies against TurboRFP				
Anti-tRFP antibody	AB231 AB232	Rabbit polyclonal antibody against TagRFP, TagFP635, TurboRFP, TurboFP602, and TurboFP635 proteins	100 µg 200 µg	D-9

Please contact your local distributor for exact prices and delivery information.

Expression/source vectors: pTurboRFP-C



For vector sequence, please visit our Web site at www.evrogen.com/pTurboRFP-C.shtml

Product	Cat.#	Size
pTurboRFP-C	**FP231**	20 µg

Please contact your local distributor for exact prices and delivery information.

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

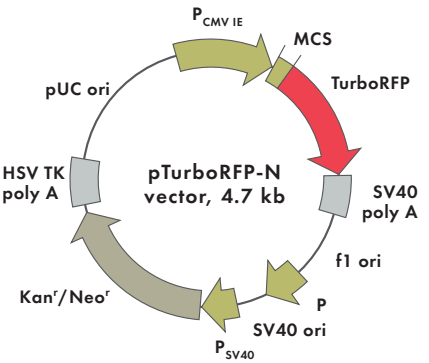
Multiple cloning site (MCS)

TurboRFP →

BspE1	BglII	SacI	EcoRI	SalI	KpnI	ApaI	BamHI	STOPs		
TCC.GGA.CTC.AGA.TCT.CGA.GCT.CAA.GCT.TCG.AAT.TCT.GCA.GTC.GAC.GGT.ACC.GCG.GGC.CCG.GGA.TCC.ACC.GGA.TCT.AGA.TAA.CTG.ATC.A										
	XhoI	HindIII	PstI		SacII	SmaI/XmaI		XbaI#	BclI#	

— sites are blocked by methylation. If you wish to digest the vector using these sites, you will need to transform the vector into a dam$^-$ host and make fresh DNA.

Expression/source vectors: pTurboRFP-N



For vector sequence, please visit our Web site at www.evrogen.com/pTurboRFP-N.shtml

Product	Cat.#	Size
pTurboRFP-N	**FP232**	20 µg

Please contact your local distributor for exact prices and delivery information.

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

Multiple cloning site (MCS)

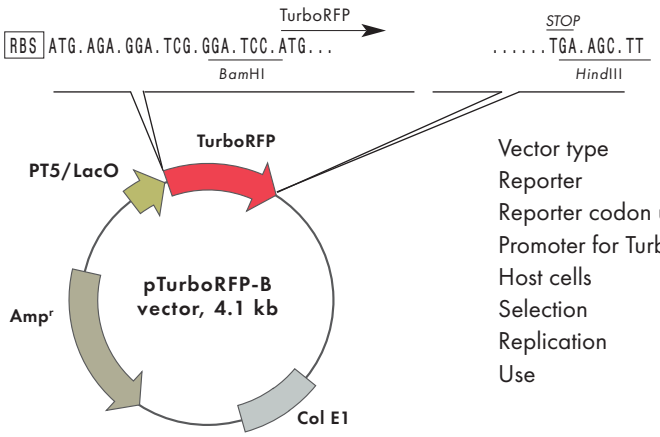
NheI	BglII	SacI	HindIII	EcoRI	SalI	KpnI	ApaI	BamHI	AgeI	TurboRFP →
G.CTA.GCG.CTA.CCG.GAC.TCA.GAT.CTC.GAG.CTC.AAG.CTT.CGA.ATT.CTG.CAG.TCG.ACG.GTA.CCG.CGG.GCC.CGG.GAT.CCA.CCG.GTC.GCC.ACC.ATG....										
Eco47III		XhoI			PstI		SacII	SmaI/XmaI		

Notice to Purchaser — please see page A-59

Expression/source vectors: pTurboRFP-B

Product	Cat.#	Size
pTurboRFP-B	**FP233**	20 µg

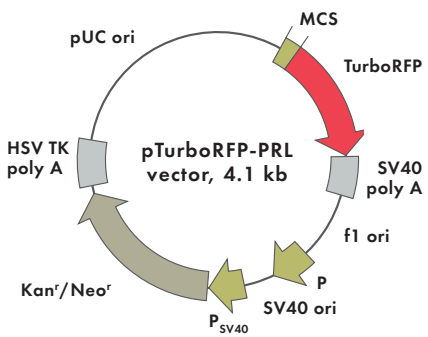
Please contact your local distributor for exact prices and delivery information.



For vector sequence, please visit our Web site at www.evrogen.com/pTurboRFP-B.shtml

Vector type	bacterial expression vector
Reporter	TurboRFP
Reporter codon usage	mammalian
Promoter for TurboRFP	T5 promoter/lac operator
Host cells	prokaryotic
Selection	ampicillin
Replication	ColE1 ori
Use	TurboRFP expression in bacterial cells using T5 promoter/lac operator; source of the TurboRFP coding sequence

Expression/source vectors: pTurboRFP-PRL



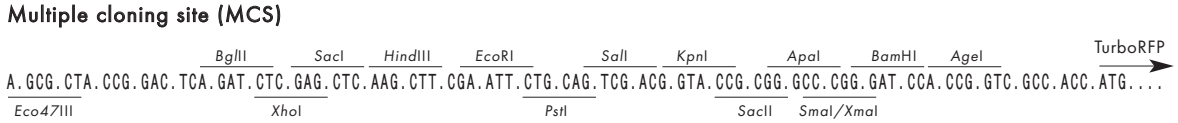
For vector sequence, please visit our Web site at www.evrogen.com/pTurboRFP-PRL.shtml

Product	Cat.#	Size
pTurboRFP-PRL	**FP235**	20 µg

Please contact your local distributor for exact prices and delivery information.

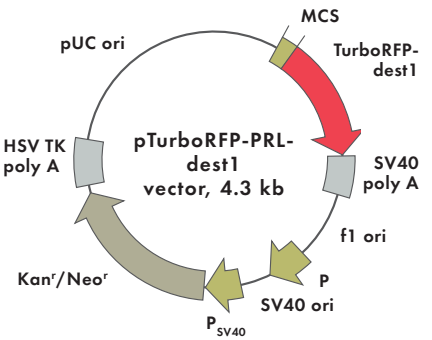
Vector type	promoterless vector
Reporter	TurboRFP
Reporter codon usage	mammalian
Promoter for TurboRFP	NO
Host cells	mammalian, bacterial
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	monitoring the activity of promoter or promoter/enhancer combination cloned into vector MCS

Multiple cloning site (MCS)



Notice to Purchaser — please see page A-59

Expression/source vectors: pTurboRFP-PRL-dest1



For vector sequence, please visit our Web site at www.evrogen.com/pTurboRFP-PRL-dest1.shtml

Product	Cat.#	Size
pTurboRFP-PRL-dest1	FP238	20 µg

Please contact your local distributor for exact prices and delivery information.

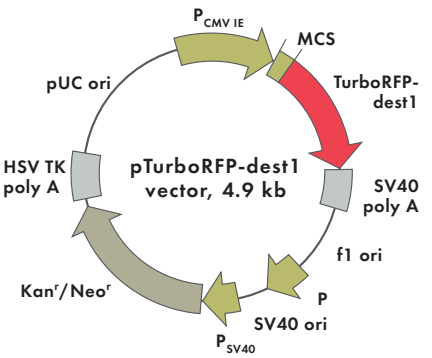
Vector type	promoterless vector
Reporter	destabilized TurboRFP (TurboRFP-dest1)
Reporter codon usage	mammalian
Promoter for TurboRFP-dest1	NO
Host cells	mammalian, prokaryotic
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	monitoring the activity of promoter or promoter/enhancer combination cloned into vector MCS. Rapid turnover of TurboRFP-dest1 allows exact measuring of changes in gene expression

Multiple cloning site (MCS)

```
                                BglII*  SacI    HindIII EcoRI           SalI    KpnI            ApaI    BamHI   AgeI
A.GCG.CTA.CCG.GAC.TCA.GAT.CTC.GAG.CTC.AAG.CTT.CGA.ATT.CTG.CAG.TCG.ACG.GTA.CCG.CGG.GCC.CGG.GAT.CCA.CCG.GTC.GCC.ACC.ATG....  TurboRFP-dest1 →
Eco47III        XhoI                    PstI*           SacII   SmaI/XmaI
```

* — not unique sites

Expression/source vectors: pTurboRFP-dest1



For vector sequence, please visit our Web site at www.evrogen.com/pTurboRFP-dest1.shtml

Product	Cat.#	Size
pTurboRFP-dest1	FP239	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	mammalian expression vector
Reporter	destabilized TurboRFP (TurboRFP-dest1)
Reporter codon usage	mammalian
Promoter for TurboRFP-dest1	$P_{CMV\ IE}$
Host cells	mammalian
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	generation of fusions to the TurboRFP-dest1 N-terminus; expression of TurboRFP-dest1 or its fusions in mammalian cells; positive control for the pTurboRFP-PRL-dest1 vector (Cat.# FP238)

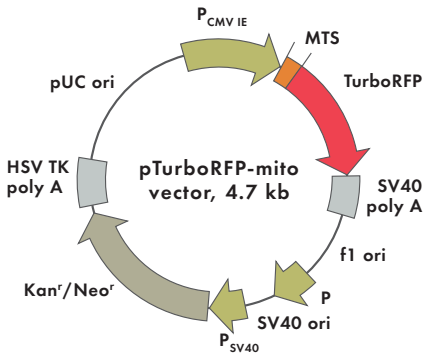
Multiple cloning site (MCS)

```
 NheI                   BglII*  SacI    HindIII EcoRI           SalI    KpnI            ApaI    BamHI   AgeI
G.CTA.GCG.CTA.CCG.GAC.TCA.GAT.CTC.GAG.CTC.AAG.CTT.CGA.ATT.CTG.CAG.TCG.ACG.GTA.CCG.CGG.GCC.CGG.GAT.CCA.CCG.GTC.GCC.ACC.ATG....  TurboRFP-dest1 →
 Eco47III       XhoI                    PstI*           SacII   SmaI/XmaI
```

* — not unique sites

Notice to Purchaser — please see page A-59

Expression/source vectors: pTurboRFP-mito



For vector sequence, please visit our Web site at www.evrogen.com/pTurboRFP-mito.shtml

Product	Cat.#	Size
pTurboRFP-mito	FP237	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	mammalian expression vector
Reporter	TurboRFP fusion with mitochondrial targeting sequence (MTS) derived from the subunit VIII of human cytochrome C oxidase
Reporter codon usage	mammalian
Promoter for TurboRFP-MTS	$P_{CMV\ IE}$
Host cells	mammalian
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	expression of mitochondria-targeted TurboRFP in mammalian cells under the control of CMV promoter; source of mitochondria-targeted TurboRFP coding sequence

Recombinant protein rTurboRFP

Product	Cat.#	Size
rTurboRFP	FP252	100 µg

Please contact your local distributor for exact prices and delivery information.

Use

- Standard on protein gels and Western blots
- Control for fluorescence microscopy
- Calibration of fluorimeters and FACS machines
- Microinjection into cells and tissues

Description

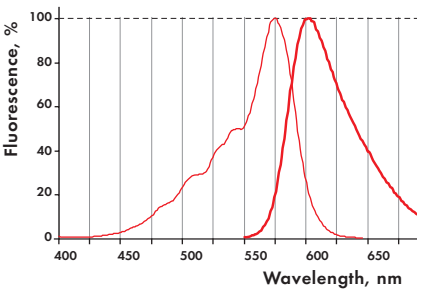
Recombinant TurboRFP (rTurboRFP) is 26-kDa red fluorescent protein. It has excitation and emission spectra identical to those of the expressed TurboRFP. rTurboRFP is suitable as control reagent for TurboRFP expression using the TurboRFP expression vectors.

rTurboRFP is purified from transformed *E. coli* using organic extraction and hydrophobic chromatography or metal-ion affinity chromatography (methods vary for different lots). Both methods ensure high purity of the recombinant protein and maintenance of fluorescence. The protein concentration is measured by chromophore absorption. rTurboRFP may contain 6xHis tag at its N-terminus (vary in different lots).

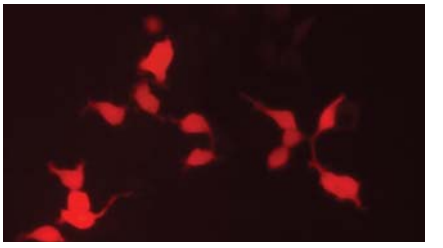
MATERIAL SAFETY DATA SHEET INFORMATION
To the best of our knowledge, these products do not require a Material Safety Data Sheet. However, all the properties of these products (and, if applicable, each of their components) have not been thoroughly investigated. Therefore, we recommend that you use gloves and eye protection, and wear a laboratory coat when working with these products.

TurboFP602

- Bright true-red fluorescence
- Fast maturation
- High pH stability
- Proven suitability to generate stably transfected cell lines
- Fluorescent signal is easily distinguished from background fluorescence
- Optimized for common filter sets
- Recommended for gene expression analysis and cell labeling in autofluorescent environment



TurboFP602 normalized excitation (thin line) and emission (thick line) spectra.
Complete TurboFP602 spectra in Excel format can be downloaded from the Evrogen Web site at www.evrogen.com/TurboFP602.shtml



TurboFP602 whole-cell expression in Phoenix cells.

Protein description

TurboFP602 is a red-shifted variant of red fluorescent protein TurboRFP. TurboFP602 possesses true-red fluorescence (with excitation/emission maxima at 574/ 602 nm, respectively), optimal for detection via most popular filter sets, and is easily distinguished from background signals. TurboFP602 exhibits fast maturation and high pH stability.

Main properties of TurboFP602

Characteristic	
Molecular weight	26 kDa
Polypeptide length	231 aa
Fluorescence color	true-red
Excitation max	574 nm
Emission max	602 nm
Quantum yield	0.35
Extinction coefficient	74 400 $M^{-1}cm^{-1}$
Brightness*	26.0
Brightness % of EGFP	79
pKa	4.7
Structure	dimer
Aggregation	no
Maturation at 37°C	fast
Photostability	medium

*Brightness is a product of extinction coefficient and quantum yield, divided by 1000.

Performance and use

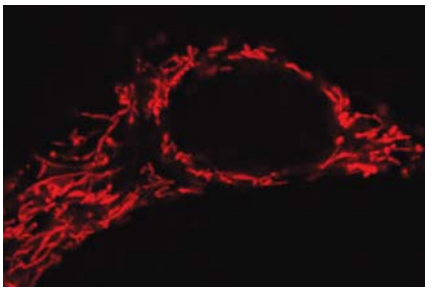
TurboFP602 is mainly intended for applications where fast appearance of true-red fluorescence is crucial. It is specially recommended for cell and organelle labeling and for tracking the promoter activity in autofluorescent tissues.

TurboFP602 can be expressed and detected in a wide range of organisms. Mammalian cells transiently transfected with TurboFP602 expression vec-

toxic effects and visible protein aggregation are observed.

Despite its dimeric structure, TurboFP602 can be used for fusion construction with cellular proteins. However, we do not recommend that you use TurboFP602 for fusions with oligomerizing cellular proteins (e.g. alpha-tubulin). Please see section "Protein Localization Tags" to select a reporter for such purposes.

Application	Performance
Cell labeling	
mammalian cells	+++
bacterial cells	++++
Stable transfection	proved
Promoter activity testing	++++
In fusions	++



TurboFP602 mitochondrial expression in HeLa cells.

Compatibility with existing filter sets and antibodies

TurboFP602 can be detected using TRITC filter set or similar. Recommended Omega Optical filter sets are QMAX-Red and XF102-2.

TurboFP602 can be recognized using Anti-tRFP antibody (Cat.# AB231-AB232) available from Evrogen (see description at D-9 page).

TurboFP602 licensing opportunities

Evrogen technology embodied in TurboFP602 is available for expanded and commercial use with an adaptable licensing program. Benefits from flexible and market-driven license options are offered for upgrade and novel development of products and applications.

For licensing information, please contact Evrogen at license@evrogen.com.

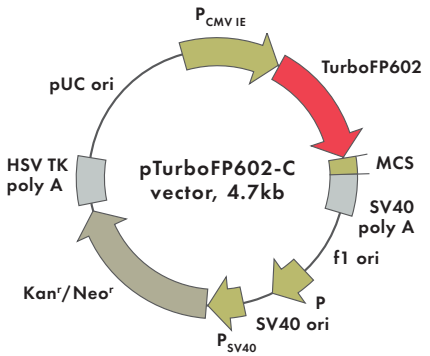
TurboFP602-related products

TurboFP602-related product line includes expression and source vectors, recombinant protein, and antibodies. For updated product information, please visit the Evrogen Web site (www.evrogen.com/TurboFP602.shtml).

Product	Cat.#	Description	Size	Page
TurboFP602 expression/source vectors				
pTurboFP602-C	FP711	Mammalian expression vector encoding humanized TurboFP602 and allowing TurboFP602 expression and generation of fusions to the TurboFP602 C-terminus	20 µg	A-63
pTurboFP602-N	FP712	Mammalian expression vector encoding humanized TurboFP602 and allowing TurboFP602 expression and generation of fusions to the TurboFP602 N-terminus	20 µg	A-63
pTurboFP602-B	FP713	Bacterial expression vector; source of humanized TurboFP602 coding sequence	20 µg	A-64
pTurboFP602-PRL	FP715	Promoterless mammalian expression vector encoding humanized TurboFP602 and designed for monitoring transcription from different promoters and promoter/enhancer combinations	20 µg	A-64
pTurboFP602-mito	FP717	Mammalian expression vector encoding humanized TurboFP602 targeted to mitochondria	20 µg	A-65
Recombinant protein				
rTurboFP602	FP751	Recombinant TurboFP602 protein	100 µg	A-65
Antibodies against TurboFP602				
Anti-tRFP antibody	AB231 AB232	Rabbit polyclonal antibody against TagRFP, TagFP635, TurboRFP, TurboFP602, and TurboFP635 proteins	100 µg 200 µg	D-9

Please contact your local distributor for exact prices and delivery information.

Expression/source vectors: pTurboFP602-C



For vector sequence, please visit our Web site at www.evrogen.com/pTurboFP602-C.shtml

Product	Cat.#	Size
pTurboFP602-C	FP711	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	mammalian expression vector
Reporter	TurboFP602
Reporter codon usage	mammalian
Promoter for TurboFP602	$P_{CMV\ IE}$
Host cells	mammalian
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	generation of fusions to the TurboFP602 C-terminus; expression of TurboFP602 or its fusions in mammalian cells

Multiple cloning site (MCS)

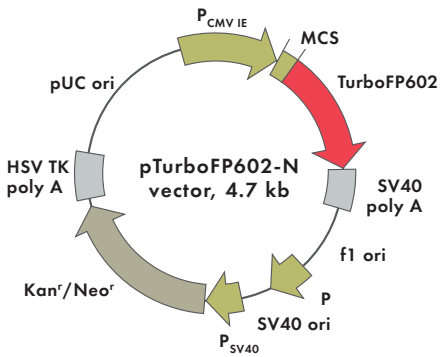
TurboFP602 → BspE1 BglII SacI EcoRI SalI KpnI ApaI BamHI STOPs

TCC.GGA.CTC.AGA.TCT.CGA.GCT.CAA.GCT.TCG.AAT.TCT.GCA.GTC.GAC.GGT.ACC.GCG.GGC.CCG.GGA.TCC.ACC.GGA.TCT.AGA.TAA.CTG.ATC.A

XhoI HindIII PstI SacII SmaI/XmaI XbaI# BclI#

— sites are blocked by methylation. If you wish to digest the vector using these sites, you will need to transform the vector into a dam- host and make fresh DNA.

Expression/source vectors: pTurboFP602-N



For vector sequence, please visit our Web site at www.evrogen.com/pTurboFP602-N.shtml

Product	Cat.#	Size
pTurboFP602-N	FP712	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	mammalian expression vector
Reporter	TurboFP602
Reporter codon usage	mammalian
Promoter for TurboFP602	$P_{CMV\ IE}$
Host cells	mammalian
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	generation of fusions to the TurboFP602 N-terminus; expression of TurboFP602 or its fusions in mammalian cells

Multiple cloning site (MCS)

NheI BglII SacI HindIII EcoRI SalI KpnI ApaI BamHI AgeI → TurboFP602

G.CTA.GCG.CTA.CCG.GAC.TCA.GAT.CTC.GAG.CTC.AAG.CTT.CGA.ATT.CTG.CAG.TCG.ACG.GTA.CCG.CGG.GCC.CGG.GAT.CCA.CCG.GTC.GCC.ACC.ATG.G..

Eco47III XhoI PstI SacII SmaI/XmaI NcoI*

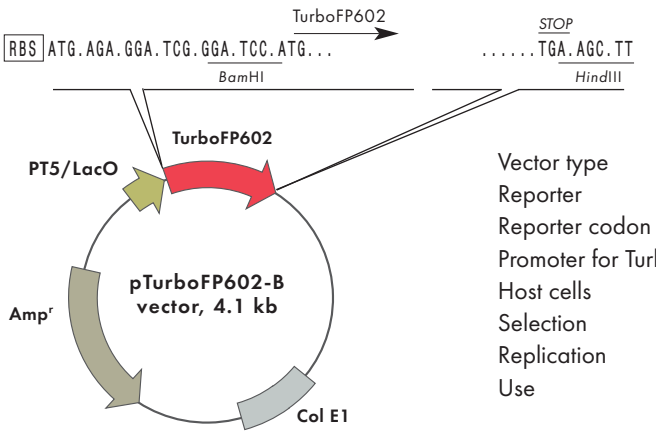
* — not unique sites

Notice to Purchaser — please see page A-65

Expression/source vectors: pTurboFP602-B

Product	Cat.#	Size
pTurboFP602-B	FP713	20 µg

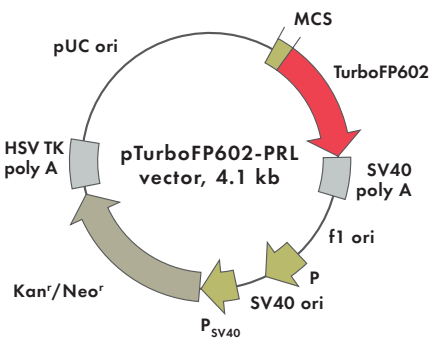
Please contact your local distributor for exact prices and delivery information.



For vector sequence, please visit our Web site at www.evrogen.com/pTurboFP602-B.shtml

Vector type	bacterial expression vector
Reporter	TurboFP602
Reporter codon usage	mammalian
Promoter for TurboFP602	T5 promoter/lac operator
Host cells	prokaryotic
Selection	ampicillin
Replication	ColE1 ori
Use	TurboFP602 expression in bacterial cells using T5 promoter/lac operator; source of the TurboFP602 coding sequence

Expression/source vectors: pTurboFP602-PRL



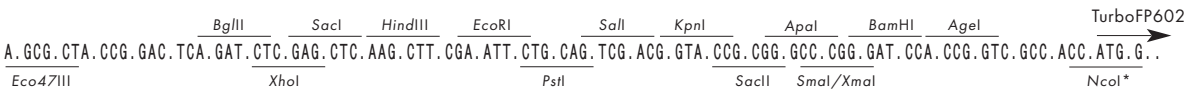
For vector sequence, please visit our Web site at www.evrogen.com/pTurboFP602-PRL.shtml

Product	Cat.#	Size
pTurboFP602-PRL	FP715	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	promoterless vector
Reporter	TurboFP602
Reporter codon usage	mammalian
Promoter for TurboFP602	NO
Host cells	mammalian, bacterial
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	monitoring the activity of promoter or promoter/enhancer combination cloned into vector MCS

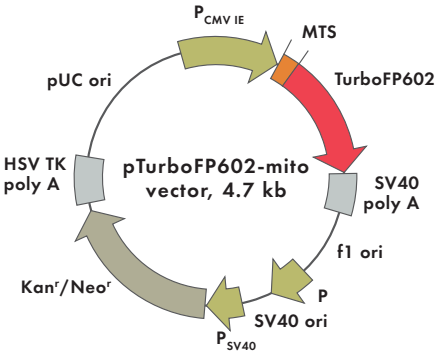
Multiple cloning site (MCS)



* — not unique sites

Notice to Purchaser — please see page A-65

Expression/source vectors: pTurboFP602-mito



For vector sequence, please visit our Web site at www.evrogen.com/pTurboFP602-mito.shtml

Product	Cat.#	Size
pTurboFP602-mito	FP717	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	mammalian expression vector
Reporter	TurboFP602 fusion with mitochondrial targeting sequence (MTS) derived from the subunit VIII of human cytochrome C oxidase
Reporter codon usage	mammalian
Promoter	$P_{CMV\ IE}$
Host cells	mammalian
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	expression of mitochondria-targeted TurboFP602 in mammalian cells under the control of CMV promoter; source of mitochondria-targeted TurboFP602 coding sequence

Recombinant protein rTurboFP602

Product	Cat.#	Size
rTurboFP602	FP751	100 µg

Please contact your local distributor for exact prices and delivery information.

Use

- Standard on protein gels and Western blots
- Control for fluorescence microscopy
- Calibration of fluorimeters and FACS machines
- Microinjection into cells and tissues

Description

Recombinant TurboFP602 (rTurboFP602) is 26-kDa red fluorescent protein. It has excitation and emission spectra identical to those of the expressed TurboFP602. rTurboFP602 is suitable as control reagent for TurboFP602 expression using the TurboFP602 expression vectors.

rTurboFP602 is purified from transformed *E. coli* using organic extraction and hydrophobic chromatography. This method ensures high purity of the recombinant protein and maintenance of fluorescence. The protein concentration is measured by chromophore absorption. rTurboFP602 contains 6xHis tag at its N-terminus.

TurboFP635

- Bright far-red fluorescence
- Fast maturation
- High pH-stability and photostability
- Proven suitability to generate stably transfected cell lines
- Fluorescent signal is easily distinguished from background fluorescence
- Recommended for gene expression analysis, cell labeling inside of tissues

Protein description

TurboFP635 (scientific name Katushka) is a novel far-red mutant of the red fluorescent protein derived from sea anemone *Entacmaea quadricolor* [1]. Possessing excitation/emission maxima at 588/635 nm, TurboFP635 is 7 to 10-fold brighter compared to the spectrally close HcRed [2] or mPlum [3], and is characterized by fast maturation and a high pH- and photo-stability. These unique characteristics make TurboFP635 the protein of choice for visualization within living tissues and dual-color high-throughput assays.

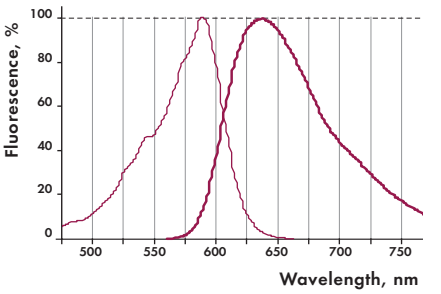
Main properties of TurboFP635

Characteristic	
Molecular weight	26.3 kDa
Polypeptide length	231 aa
Fluorescence color	far-red
Excitation max	588 nm
Emission max	635 nm
Quantum yield	0.34
Extinction coefficient	65 000 M-1cm-1
Brightness*	22.1
Brightness % of EGFP	67
pKa	5.5
Structure	dimer
Aggregation	no
Maturation at 37°C	superfast
Photostability	high

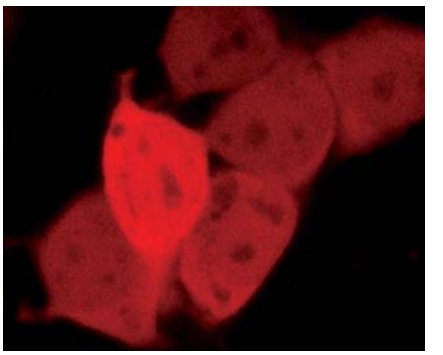
*Brightness is a product of extinction coefficient and quantum yield, divided by 1000.

Performance and use

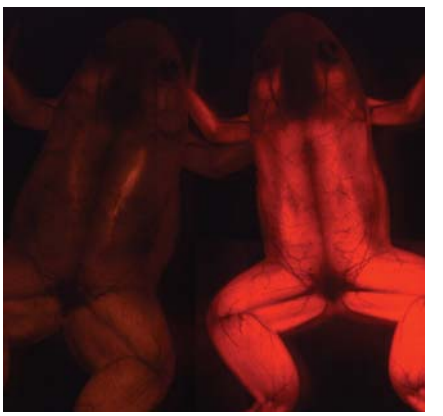
TurboFP635 is mainly intended for applications where fast appearance of far-red fluorescence is crucial. It is specially recommended for whole body imaging, cell and organelle labeling, and for tracking the promoter activity in auto-fluorescent tissues. TurboFP635 can be expressed and detected in a wide range of organisms. Mammalian cells transiently transfected with TurboFP635 expression vectors give bright fluorescent signals within 10-12 hours after transfection. No cell toxic effects and visible protein aggregation are observed.



TurboFP635 normalized excitation (thin line) and emission (thick line) spectra.
Complete TurboFP635 spectra in Excel format can be downloaded from the Evrogen website at www.evrogen.com/TurboFP635.shtml



TurboFP635 expression in Phoenix cells.



DsRed-Express and TurboFP635 expression in Xenopus laevis.
Transgenic 2.5 months intact animals expressing TurboFP635 and DsRed-Express under the control of cardiac actin promoter are shown from the dorsal side. TurboFP635 (on the right) is excellently visible in the whole body, while DsRed-Express (on the left) can be hardly visualized. This experiment clearly demonstrates the advantage of longer wavelength emission of TurboFP635 for the whole body imaging. Leica MZFLIII fluorescent stereomicroscope, excitation filter 546/10; emission filter 565LP. Image from ref.[1]

Despite its dimeric structure, TurboFP635 can be used for fusion construction with cellular proteins. However we recommend to use TagFPs (see section "Protein Localization Tags") for these purposes.

Application	Performance
Cell labeling	
mammalian cells	++++
bacterial cells	++++
Stable transfection	proved
Promoter activity testing	++++
In fusions	++

Compatibility with existing filter sets and antibodies

Recommended Omega Optical filter sets for TurboFP635 are QMAX-Red and XF102-2.

TurboFP635 can be recognized using Anti-tRFP antibody (Cat.# AB231-AB232) available from Evrogen.

TurboFP635 licensing opportunities

Evrogen technology embodied in TurboFP635 is available for expanded and commercial use with an adaptable licensing program. Benefit from flexible and market-driven license options offered for upgrade and novel development of products and applications. For licensing information please contact Evrogen at license@evrogen.com.

References
1. Shcherbo et al. (2007) Nat. Methods 4(9): 741 - 746
2. Gurskaya et al. (2001) FEBS Lett. 507: 16-20.
3. Wang et al. (2004) Proc Natl Acad Sci U S A 101: 16745-16749.

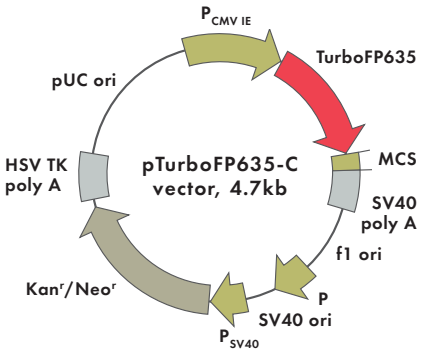
TurboFP635-related products

TurboFP635-related product line include expression vectors and antibodies. Each of these products is described in details in this section below. For updated product information please visit the Evrogen web site (www.evrogen.com/TurboFP635.shtml).

Product	Cat.#	Description	Size	Page
TurboFP635 expression/source vectors				
pTurboFP635-C	FP721	C-terminal mammalian expression vector encoding humanized TurboFP635 and allowing TurboFP635 expression and generation of fusions to the TurboFP635 C-terminus	20 µg	A-68
pTurboFP635-N	FP722	N-terminal mammalian expression vector encoding humanized TurboFP635 and allowing TurboFP635 expression and generation of fusions to the TurboFP635 N-terminus	20 µg	A-68
Antibodies against TurboFP635				
Anti-tRFP antibody	AB231 AB232	Rabbit polyclonal antibody against TagRFP, TagFP635, TurboRFP, TurboFP602 and TurboFP635 proteins	100 µg 200 µg	D-9

Please contact your local distributor for exact prices and delivery information.

Expression/source vectors: pTurboFP635-C



For vector sequence please visit our website at www.evrogen.com/pTurboFP635-C.shtml

Product	Cat.#	Size
pTurboFP635-C	**FP721**	20 µg

Please contact your local distributor for exact prices and delivery information.

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	generation of fusions to the TurboFP635 C-terminus; expression of TurboFP635 or its fusions in mammalian cells

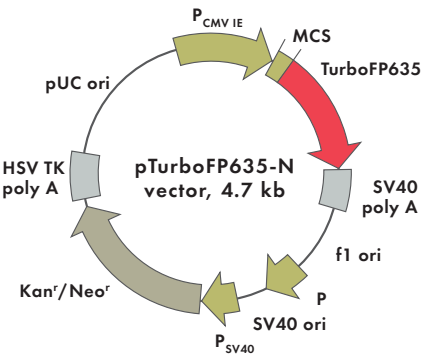
Multiple cloning site (MCS)

TurboFP635 →

BspE1	BglII	SacI		EcoRI	SalI	KpnI	ApaI	BamHI	STOPs		
TCC.GGA.CTC.AGA.TCT.CGA.GCT.CAA.GCT.TCG.AAT.TCT.GCA.GTC.GAC.GGT.ACC.GCG.GGC.CCG.GGA.TCC.ACC.GGA.TCT.AGA.TAA.CTG.ATC.A											
	XhoI		HindIII		PstI		SacII	SmaI/XmaI		XbaI#	BclI#*

— sites are blocked by methylation. If you wish to digest the vector using these sites, you will need to transform the vector into a dam⁻ host and make fresh DNA; * — not unique sites.

Expression/source vectors: pTurboFP635-N



For vector sequence please visit our website at www.evrogen.com/pTurboFP635-N.shtml

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

Please contact your local distributor for exact prices and delivery information.

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	generation of fusions to the TurboFP635 N-terminus; expression of TurboFP635 or its fusions in mammalian cells

Multiple cloning site (MCS)

NheI		BglII	SacI	HindIII	EcoRI	SalI	KpnI	ApaI	BamHI	AgeI	TurboFP635 →
G.CTA.GCG.CTA.CCG.GAC.TCA.GAT.CTC.GAG.CTC.AAG.CTT.CGA.ATT.CTG.CAG.TCG.ACG.GTA.CCG.CGG.GCC.CGG.GAT.CCA.CCG.GTC.GCC.ACC.ATG.G..											
	Eco47III		XhoI			PstI		SacII	SmaI/XmaI		NcoI*

* — not unique sites.

Notice to Purchaser:
TurboFP635-related products: These products are intended for research use only and covered by 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 (Appendix A, page G-5).
CMV Promoter: 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.

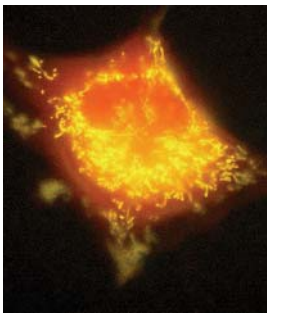
MATERIAL SAFETY DATA SHEET INFORMATION
ATTENTION: Safety Officer. EVROGEN JSC (Moscow, Russia) hereby confirms that to the best of our knowledge these products do not require a Material Safety Data Sheet. However, all of the properties of these products (and, if applicable, each of its components) have not been thoroughly investigated. Therefore, we recommend that you use gloves and eye protection and wear a laboratory coat when working with these products.

Other fluorescent proteins

Fluorescent proteins for common use

Proteins available:

- **Phi-Yellow fluorescent proteins**
  source — jellyfish *Phialidium* sp.
  excitation max — 525 nm
  emission max — 537 nm
- **red fluorescent protein JRed**
  source — Anthomedusae jellyfish
  excitation max — 584 nm
  emission max — 610 nm



Stably transfected M3 cells expressing PhiYFP in mitochondria and JRed in cytosol.
Photograph of cells was provided by Dr. Christian Petzelt (Marinpharm).

Main properties of Phi-Yellow (PhiYFP and PhiYFP-m) and JRed:

Characteristic	PhiYFP	PhiYFP-m	JRed
Fluorescence color	yellow	yellow	true-red
Excitation max	525 nm	525 nm	584 nm
Emission max	537 nm	537 nm	610 nm
Quantum yield	0.40	0.39	0.20
Extinction coefficient	130 000 $M^{-1}cm^{-1}$	124 000 $M^{-1}cm^{-1}$	44 000 $M^{-1}cm^{-1}$
Brightness	52.0	48.4	8.8
Brightness, % of EGFP	158	147	26
pKa	6.0	6.0	5.0
Structure	dimer	dimer	dimer
Cell Toxicity	not observed	not observed	at certain excitation wavelengths
Aggregation	no	no	no
Maturation at 37°C	fast	fast	slow
Photostability	high	high	medium
Molecular weight	26 kDa	26 kDa	27 kDa
Main advantages	Bright and fast-maturing true-yellow fluorescent protein suitable for generation of stably transfected cell lines	Bright and fast-maturing true-yellow fluorescent protein suitable for generation of stably transfected cell lines	True-red fluorescent protein with good compatibility with popular filter sets
Possible limitations	Dimer, limited applicability for generation of fusions; unsuitable for generation of fusions to its C-terminus	Dimer, limited applicability for generation of fusions	Dimer, limited applicability for generation of fusions; unsuitable for expression in bacteria

Brightness is a product of extinction coefficient and quantum yield, divided by 1000.

Phi-Yellow proteins

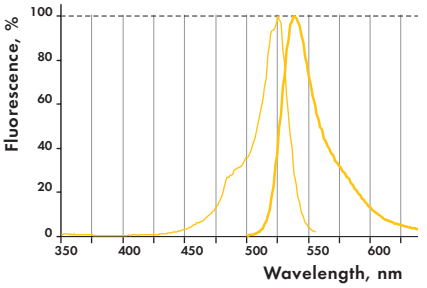
- **Bright yellow fluorescence**
- **Proven availability to generate stably transfected cell lines**
- **Destabilized variant is available**

Protein description

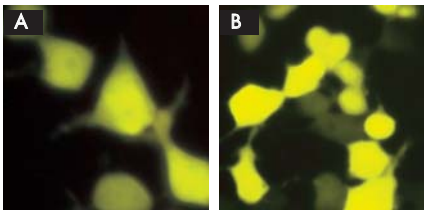
PhiYFP and PhiYFP-m are mutants of a natural yellow fluorescent protein from *Phialidium* sp. (Cnidaria; Hydrozoa; Hydroida; Leptomedusae; Campanulariidae) [1] and previous versions of TurboYFP.

They possess less brightness and maturation rate than TurboYFP, but are more suitable for generation of stably transfected cell lines and for organelle labeling.

The emission wavelength of Phi-Yellow proteins is ideally positioned between those of green and red fluorescent proteins, allowing easy separation of these fluorescent tags by flow cytometry using common channels of detection and a single laser excitation line.



PhiYFP and PhiYFP-m normalized excitation (thin line) and emission (thick line) spectra.
Complete Phi-Yellow spectra in Excel format can be downloaded from the Evrogen Web site at www.evrogen.com/PhiYFP.shtml



Expression of Phi-Yellow proteins in transiently transfected mammalian cells: (A) — PhiYFP-m; (B) — PhiYFP.

Main properties of Phi-Yellow proteins

Characteristic	PhiYFP	PhiYFP-m
Molecular weight, kDa	26	26
Polypeptide length, aa	234	234
Fluorescence color	yellow	yellow
Excitation max, nm	525	525
Emission max, nm	537	537
Quantum yield	0.40	0.39
Extinction coefficient, $M^{-1}cm^{-1}$	130 000	124 000
Brightness*	52.0	48.4
Brightness % of EGFP	158	147
pKa	6.0	6.0
Structure	dimer	dimer
Aggregation	no	no
Maturation at 37°C	fast	fast
Photostability	high	high

*Brightness is a product of extinction coefficient and quantum yield, divided by 1000.

Destabilized PhiYFP-m

Destabilized PhiYFP-m variant (PhiYFP-m-dest1) is produced by fusing the initial protein with PEST amino acid sequence encoded by region 422-461 of mouse ornithine decarboxylase gene [2]. This sequence targets the protein to degradation and enables a rapid protein turnover.

PhiYFP-m-dest1 retains spectral properties of the initial protein, but has shorter half-life (approximately 2 hrs) as measured by the analysis of fluorescence intensity of cells treated with a protein synthesis inhibitor, cycloheximide. Because of rapid turnover, PhiYFP-m-dest1 can be used to measure changes in gene expression.

Performance and use

Phi-Yellow proteins can be easily expressed and detected in a wide range of organisms, from bacteria to mammals. Transient transfection of mammalian cell lines with these proteins results in bright yellow fluorescent signals without visible aggregation. Fluorescence is clearly detected within 12 hrs after transfection.

Despite dimerization capacity, Phi-Yellow proteins demonstrate successful performance in fusions with subcellular localization signals and many cellular proteins. However, we recommend that you use TagFPs for protein labeling applications. Please see section "Protein Localization Tags" to select a reporter for such purposes.

Important note: PhiYFP allows generation of fusions to its N-terminus, whereas PhiYFP-m is optimized to generate fusions to its C-terminus. PhiYFP can not be used to generate C-terminal fusions.

Application	Performance
Cell labeling	
mammalian cells	++++
bacterial cells	+++
Stable transfection	proved
Promoter activity testing	+++
In fusions	++

Compatibility with existing filter sets and antibodies

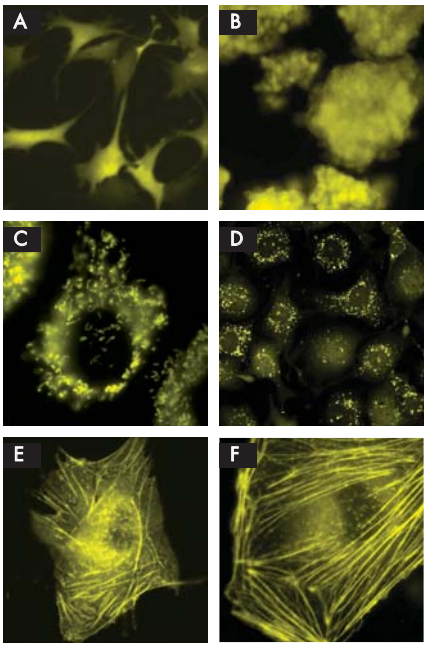
Phi-Yellow proteins can be detected using Omega filter set XF104-3 or Chroma Technology corporation filter set 42003 ("ZsYellow1").

The proteins can be recognized using Anti-PhiYFP and Anti-PhiYFP(d) antibodies (Cat.# AB601-AB604, see pages D-7 and D-8 for descriptions) available from Evrogen.

Phi-Yellow licensing opportunities

Evrogen technology embodied in Phi-Yellow proteins is available for expanded and commercial use with an adaptable licensing program. Benefits from flexible and market-driven license options are offered for upgrade and novel development of products and applications.

For licensing information, please contact Evrogen at license@evrogen.com.



Phi-Yellow expression in stably transfected mammalian cells.
(A) — PhiYFP whole-cell expression in BC3H1 mouse brain tumor cells; (B) — PhiYFP whole-cell expression in PC-12 pheochromocytoma cells; (C) — mitochondrial expression of PhiYFP in 3T3 mouse fibroblasts; (D) Peroxisomal expression of PhiYFP-m in T-24 human bladder carcinoma cells; (E) — expression of PhiYFP-m fusion with cytoplasmic beta-actin in MADIN-DARBY canine kidney epithelial cells; (F) — expression of PhiYFP-m fusion with cytoplasmic beta-actin in rat kangaroo kidney epithelium cells PtK2.
Photographs of stably transfected cell lines were provided by Dr. Christian Petzelt (Marinpharm).

References

1. Shagin *et al.* (2004) Mol. Biol. Evol. 21(5): 841-850.
2. Li *et al.* (1998) J. Biol. Chem. 273:34970-34975.

Phi-Yellow-related products

Phi-Yellow-related product line includes expression and source vectors, recombinant protein, and antibodies. For updated product information, please visit the Evrogen Web site (www.evrogen.com/PhiYFP.shtml).

Product	Cat.#	Description	Size	Page
Phi-Yellow expression/source vectors				
pPhi-Yellow-C	FP601	Mammalian expression vector encoding humanized PhiYFP-m and allowing PhiYFP-m expression and generation of fusions to the PhiYFP-m C-terminus	20 µg	A-75
pPhi-Yellow-N	FP602	Mammalian expression vector encoding humanized PhiYFP and allowing PhiYFP expression and generation of fusions to the PhiYFP N-terminus Note: PhiYFP is not suitable for fusion construction to the reporter C-terminus	20 µg	A-75
pPhi-Yellow-B	FP603	Bacterial expression vector; source of humanized PhiYFP coding sequence	20 µg	A-76
pPhi-Yellow-PRL	FP604	Promoterless expression vector encoding humanized PhiYFP and designed for monitoring transcription from different promoters and promoter/enhancer combinations	20 µg	A-76
pPhi-Yellow-PRL-dest1	FP605	Promoterless vector encoding destabilized PhiYFP-m and designed for monitoring transcription from different promoters and promoter/enhancer combinations	20 µg	A-77
pPhi-Yellow-dest1	FP608	Mammalian expression vector encoding destabilized PhiYFP-m and allowing PhiYFP-m-dest1 expression and generation of fusions to the N-terminus of PhiYFP-m-dest1	20 µg	A-77
pPhi-Yellow-peroxi	FP606	Mammalian expression vector encoding humanized PhiYFP-m targeted to peroxisomes	20 µg	A-78
pPhi-Yellow-mito	FP607	Mammalian expression vector encoding humanized PhiYFP targeted to mitochondria	20 µg	A-78
Recombinant protein				
rPhiYFP	FP651	Purified recombinant yellow fluorescent protein rPhiYFP	100 µg	A-79
Antibodies against Phi-Yellow proteins				
Anti-PhiYFP antibody	AB601 AB602	Rabbit polyclonal antibody against non-denatured TurboYFP, PhiYFP, and PhiYFP-m.	100 µg 200 µg	D-7
Anti-PhiYFP(d) antibody	AB603 AB604	Rabbit polyclonal antibody against denatured TurboYFP, PhiYFP, and PhiYFP-m.	100 µg 200 µg	D-8

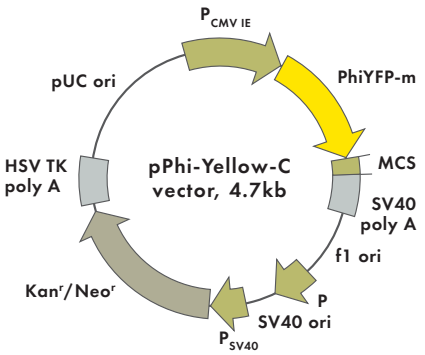
Please contact your local distributor for exact prices and delivery information.

Third party products: stably transfected cell lines expressing Phi-Yellow proteins

Cell line	Source	Description
M3-PY	mouse	M3 mouse melanoma cells expressing PhiYFP in cytosol
PC-PY	rat	PC-12 rat pheochromocytoma expressing PhiYFP in cytosol
T406-PY	human	T406 human glioma expressing PhiYFP in cytosol
BC3-PY	mouse	BC3H1 myoblast cells expressing PhiYFP in cytosol
W-PY	rat	WALKER 256 rat tumor expressing PhiYFP in cytosol
T24-PY	human	T24 human bladder carcinoma expressing PhiYFP in cytosol
T24-PY-dest	rat	Rat kangaroo kidney epithelium PtK2 cells expressing destabilized PhiYFP-m in cytosol
T24-PY-P	rat	Rat kangaroo kidney epithelium PtK2 cells expressing PhiYFP-m in peroxisomes
C2C12-PY-Mito	mouse	Mouse myoblast cells expressing PhiYFP in mitochondria
3T3-PY-Mito	mouse	Mouse fibroblasts 3T3 expressing PhiYFP in mitochondria
P-PY-Mito	rat	Rat kangaroo kidney epithelium PtK2 expressing PhiYFP in mitochondria
M3-JR-PY-Mito	mouse	Doubly transfected mouse melanoma M3 cells expressing PhiYFP in mitochondria and JRed in cytosol
P-PY-A	rat	Rat kangaroo kidney epithelium PtK2 expressing PhiYFP-m fusion with beta-actin
T47-PY-A	human	T47-D human breast cancer cells expressing PhiYFP-m fusion with beta-actin
MDCK-PY-A	canine	MADIN-DARBY-canine kidney epithelial cells expressing PhiYFP-m fusion with beta-actin
3T3-PY-A	mouse	Mouse fibroblasts 3T3 expressing PhiYFP-m fusion with beta-actin
H-PY-A	human	HeLa human cervical carcinoma expressing PhiYFP-m fusion with beta-actin

Cell lines are manufactured by Marinpharm GmbH (Berlin, Germany) under the Evrogen license.

Expression/source vectors: pPhi-Yellow-C



For vector sequences please visit our Web site at www.evrogen.com/p-phiYFP-C.shtml

Product	Cat.#	Size
pPhi-Yellow-C	FP601	20 µg

Please contact your local distributor for exact prices and delivery information.

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

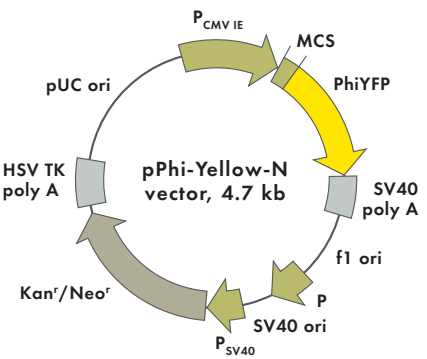
Multiple cloning site (MCS)

PhiYFP-m →

SacI		EcoRI	SalI	KpnI	ApaI	BamHI	STOPs		
....CT.CGA.GCT.CAA.GCT.TCG.AAT.TCT.GCA.GTC.GAC.GGT.ACC.GCG.GGC.CCG.GGA.TCC.ACC.GGA.TCT.AGA.TAA.CTG.ATC.A									
XhoI	HindIII	PstI		SacII*	SmaI/XmaI		XbaI#	BclI#	

* — not unique sites. # — sites are blocked by methylation. If you wish to digest the vector using these sites, you will need to transform the vector into a dam- host and make fresh DNA.

Expression/source vectors: pPhi-Yellow-N



For vector sequence, please visit our Web site at www.evrogen.com/p-phiYFP-N.shtml

Product	Cat.#	Size
pPhi-Yellow-N	FP602	20 µg

Please contact your local distributor for exact prices and delivery information.

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

Multiple cloning site (MCS)

NheI		BglII*	SacI	HindIII*	EcoRI	SalI	KpnI	ApaI	BamHI	AgeI	PhiYFP →
G.CTA.GCG.CTA.CCG.GAC.TCA.GAT.CTC.GAG.CTC.AAG.CTT.CGA.ATT.CTG.CAG.TCG.ACG.GTA.CCG.CGG.GCC.CGG.GAT.CCA.CCG.GTC.GCC.ACC.ATG....											
Eco47III		XhoI				PstI		SacII*	SmaI/XmaI		

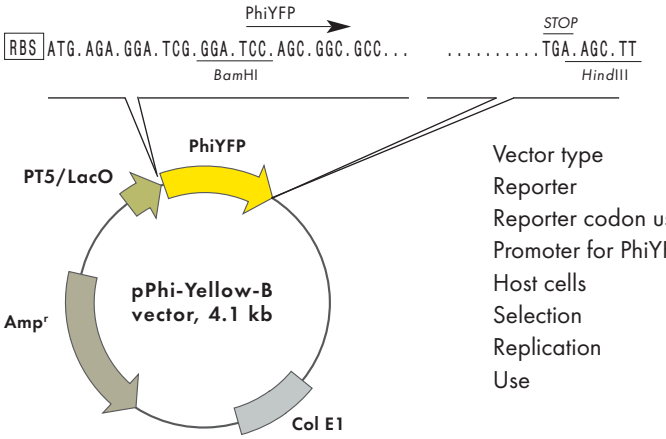
* — not unique sites.

Notice to Purchaser — please see page A-79

Expression/source vectors: pPhi-Yellow-B

Product	Cat.#	Size
pPhi-Yellow-B	**FP603**	20 µg

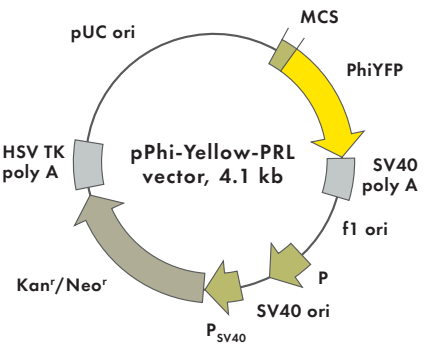
Please contact your local distributor for exact prices and delivery information.



For vector sequence, please visit our Web site at www.evrogen.com/p-phiYFP-B.shtml

Vector type	bacterial expression vector
Reporter	PhiYFP
Reporter codon usage	mammalian
Promoter for PhiYFP	T5 promoter/lac operator
Host cells	prokaryotic
Selection	ampicillin
Replication	ColE1 ori
Use	PhiYFP expression in bacterial cells using T5 promoter/lac operator; source of the PhiYFP coding sequence

Expression/source vectors: pPhi-Yellow-PRL



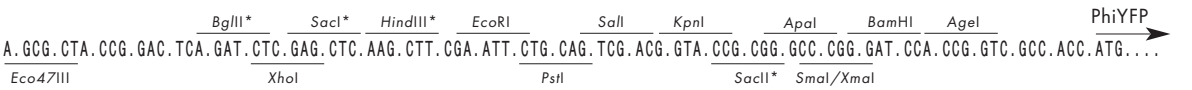
For vector sequence, please visit our Web site at www.evrogen.com/p-phiYFP-PRL.shtml

Product	Cat.#	Size
pPhi-Yellow-PRL	**FP604**	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	promoterless vector
Reporter	PhiYFP
Reporter codon usage	mammalian
Promoter for PhiYFP	NO
Host cells	mammalian, bacterial
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	monitoring the activity of promoter or promoter/enhancer combination cloned into vector MCS

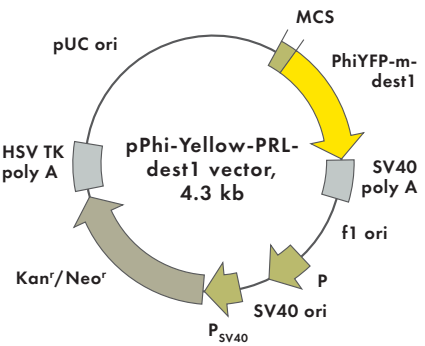
Multiple cloning site (MCS)



* — not unique sites.

Notice to Purchaser — please see page A-79

Expression/source vectors: pPhi-Yellow-PRL-dest1



For vector sequence, please visit our Web site at www.evrogen.com/p-phiYFP-PRLd1.shtml

Product	Cat.#	Size
pPhi-Yellow-PRL-dest1	FP605	20 µg

Please contact your local distributor for exact prices and delivery information.

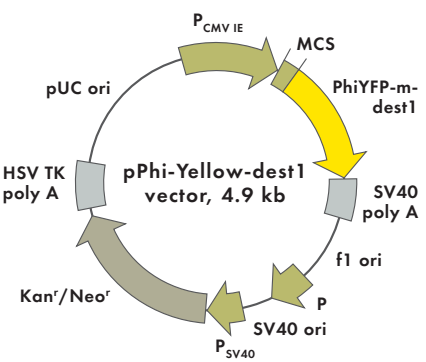
Vector type	promoterless vector
Reporter	PhiYFP-m-dest1
Reporter codon usage	mammalian
Promoter for PhiYFP-m-dest1	NO
Host cells	mammalian, prokaryotic
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	monitoring the activity of promoter or promoter/enhancer combination cloned into vector MCS. Rapid turnover of PhiYFP-m-dest1 allows exact measuring of changes in gene expression

Multiple cloning site (MCS)

```
                                BglII*  SacI  HindIII  EcoRI      SalI  KpnI      ApaI  BamHI  AgeI                PhiYFP-m-dest1 →
A.GCG.CTA.CCG.GAC.TCA.GAT.CTC.GAG.CTC.AAG.CTT.CGA.ATT.CTG.CAG.TCG.ACG.GTA.CCG.CGG.GCC.CGG.GAT.CCA.CCG.GTC.GCC.ACC.ATG....
Eco47III          XhoI*                    PstI*                SacII*  SmaI/XmaI
```

* — not unique sites.

Expression/source vectors: pPhi-Yellow-dest1



For vector sequence, please visit our Web site at www.evrogen.com/pPhiYFP-dest1.shtml

Product	Cat.#	Size
pPhi-Yellow-dest1	FP608	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	mammalian expression vector
Reporter	PhiYFP-m-dest1
Reporter codon usage	mammalian
Promoter for PhiYFP-m-dest1	$P_{CMV\ IE}$
Host cells	mammalian
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	generation of fusions to the PhiYFP-m-dest1 N-terminus; expression of PhiYFP-m-dest1 or its fusions in mammalian cells; positive control for the pPhiYFP-m-PRL-dest1 vector (cat.# FP605)

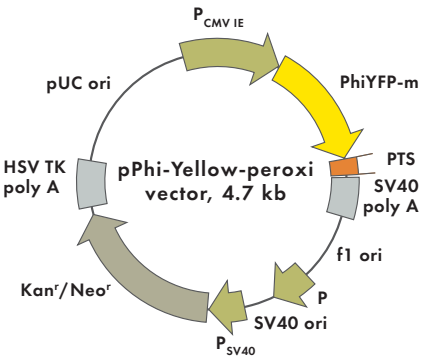
Multiple cloning site (MCS)

```
NheI                BglII*  SacI  HindIII  EcoRI      SalI  KpnI      ApaI  BamHI  AgeI                PhiYFP-m-dest1 →
G.CTA.GCG.CTA.CCG.GAC.TCA.GAT.CTC.GAG.CTC.AAG.CTT.CGA.ATT.CTG.CAG.TCG.ACG.GTA.CCG.CGG.GCC.CGG.GAT.CCA.CCG.GTC.GCC.ACC.ATG....
Eco47III          XhoI*                    PstI*                SacII*  SmaI/XmaI
```

* — not unique sites.

Notice to Purchaser — please see page A-79

Expression/source vectors: pPhi-Yellow-peroxi



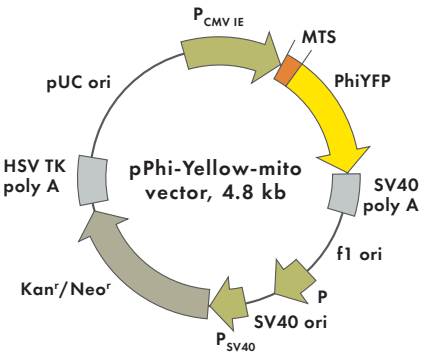
For vector sequence, please visit our Web site at www.evrogen.com/p-phiYFP-peroxi.shtml

Product	Cat.#	Size
pPhi-Yellow-peroxi	**FP606**	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	mammalian expression vector
Reporter	PhiYFP-m fusion with the peroxisome targeting signal (PTS)
Reporter codon usage	mammalian
Promoter for PhiYFP-m	$P_{CMV\ IE}$
Host cells	mammalian
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	expression of peroxisome-targeted PhiYFP-m in mammalian cells under the control of CMV promoter; source of peroxisome-targeted PhiYFP-m coding sequence

Expression/source vectors: pPhi-Yellow-mito



For vector sequence, please visit our Web site at www.evrogen.com/p-phiYFP-mito.shtml

Product	Cat.#	Size
pPhi-Yellow-mito	**FP607**	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	mammalian expression vector
Reporter	PhiYFP fusion with mitochondrial targeting sequence (MTS) derived from the subunit VIII of human cytochrome C oxidase
Reporter codon usage	mammalian
Promoter for PhiYFP	$P_{CMV\ IE}$
Host cells	mammalian
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	expression of mitochondria-targeted PhiYFP in mammalian cells under the control of CMV promoter; source of mitochondria-targeted PhiYFP coding sequence

Notice to Purchaser — please see page A-79

Recombinant protein rPhiYFP

Product	Cat.#	Size
rPhiYFP	FP651	100 µg

Please contact your local distributor for exact prices and delivery information.

Use

- Standard on protein gels and Western blots
- Control for fluorescence microscopy
- Calibration of fluorimeters and FACS machines
- Microinjection into cells and tissues

Description

Recombinant PhiYFP (rPhiYFP) is 26-kDa yellow fluorescent protein. It has excitation and emission spectra identical to those of the expressed PhiYFP. rPhiYFP is suitable as control reagent for PhiYFP expression using the PhiYFP expression vectors.

rPhiYFP is purified from transformed *E. coli* using organic extraction and hydrophobic chromatography or metal-ion affinity chromatography (methods vary for different lots). Both methods ensure high purity of the recombinant protein and maintenance of fluorescence.

The protein concentration is measured by chromophore absorption. rPhiYFP may contain 6xHis tag at its N-terminus (vary in different lots).

MATERIAL SAFETY DATA SHEET INFORMATION
To the best of our knowledge, these products do not require a Material Safety Data Sheet. However, all the properties of these products (and, if applicable, each of their components) have not been thoroughly investigated. Therefore, we recommend that you use gloves and eye protection, and wear a laboratory coat when working with these products.

JRed

- True-red fluorescence
- Proven suitability to create stably transfected cell lines

Protein description

JRed is a red fluorescent protein obtained by mutagenesis of Anthomedusae jellyfish chromoprotein [1]. JRed fluorescence can be detected using most popular filter sets.

Main properties of JRed

Characteristic	
Molecular weight	27 kDa
Polypeptide length	242 aa
Fluorescence color	true red
Excitation max	584 nm
Emission max	610 nm
Quantum yield	0.20
Extinction coefficient	44 000 $M^{-1}cm^{-1}$
Brightness*	8.8
Brightness % of EGFP	26
pKa	5.0
Structure	dimer
Aggregation	no
Maturation at 37°C	slow
Photostability	medium

*Brightness is a product of extinction coefficient and quantum yield, divided by 1000.

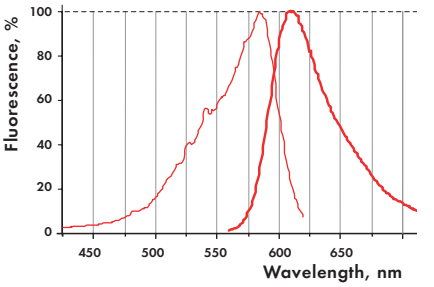
Performance and use

JRed can be expressed in eukaryotic cells; however, it is not appropriate for expression in prokaryotes.

Mammalian cells transiently transfected with JRed vector give red fluorescence without visible aggregation. Fluorescence is clearly detected within 24 hrs after transfection.

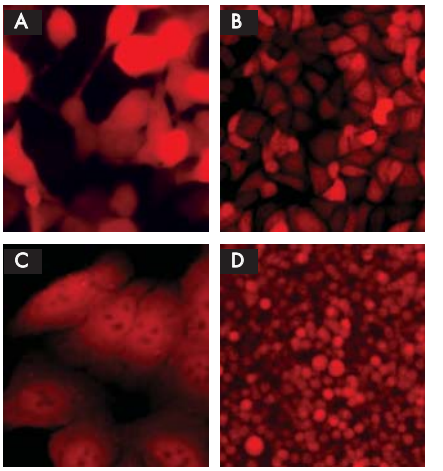
JRed shows successful performance in many fusions including that with cytoplasmic beta-actin, BH3 interacting domain death agonist (BID), nucleolar protein fibrillarin, dopamin transporter (hDAT). In addition, a number of stably transfected cell lines expressing JRed were generated by Marinpharm GmbH.

JRed possesses relatively fast photobleaching rate upon arc lamp irradiation. At the same time, it exhibits high photostability when excited by 543 nm laser line in a confocal microscope, with the photobleaching time several times longer compared with DsRed2. JRed could show phototoxicity when bleached.



JRed normalized excitation (thin line) and emission (thick line) spectra.

Complete JRed spectra in Excel format can be downloaded from the Evrogen Web site at www.evrogen.com/JRED.shtml



Fluorescent microscopy of mammalian cells expressing JRed in cytosol.

(A) — Transiently transfected 293T cells; (B) — stably transfected T24 cells; (C) — stably transfected HeLa cells; (D) — stably transfected WALKER cells. Photographs of stably transfected cell lines were provided by Dr. Christian Petzelt (Marinpharm).

Application	Performance
Cell labeling	
mammalian cells	++
bacterial cells	-
Stable transfection	proved
Promoter activity testing	++
In fusions	++

Compatibility with existing filter sets and antibodies

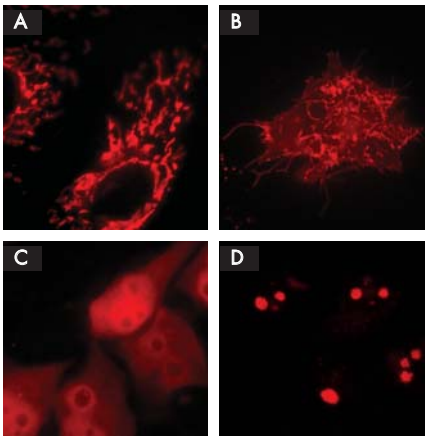
JRed can be detected using TRITC filter set or similar. Recommended Omega filter sets are QMAX-Red and XF174.

JRed can be recognized using Anti-KillerRed antibody (Cat.# AB961-AB962) available from Evrogen (see description on page D-11).

JRed licensing opportunities

Evrogen technology embodied in JRed is available for expanded and commercial use with an adaptable licensing program. Benefits from flexible and market-driven license options are offered for upgrade and novel development of products and applications.

For licensing information, please contact Evrogen at license@evrogen.com.



Fluorescent microscopy of mammalian cells expressing JRed fusions.
(A) — Mitochondria-targeted JRed in HeLa cells; (B) — JRed-hDAT fusion in PAE cells; (C) — JRed-BID fusion in HeLa cells; (D) — JRed-fibrillarin fusion in HeLa cells

References

1. Shagin *et al.* (2004) Mol. Biol. Evol. 21(5): 841-850.

JRed-related products

JRed-related product line includes expression and source vectors for JRed expression. For updated product information, please visit the Evrogen Web site (www.evrogen.com/JRed.shtml).

Product	Cat.#	Description	Size	Page
JRed expression/source vectors				
pJRed-C	FP701	Mammalian expression vector encoding humanized JRed and allowing JRed expression and generation of fusions to the JRed C-terminus	20 µg	A-83
pJRed-N	FP702	Mammalian expression vector encoding humanized JRed and allowing JRed expression and generation of fusions to the JRed N-terminus	20 µg	A-83
pJRed-PRL	FP705	Promoterless expression vector encoding humanized JRed and designed for monitoring transcription from different promoters and promoter/enhancer combinations	20 µg	A-84
Antibodies against JRed				
Anti-KillerRed antibody	AB961 AB962	Rabbit polyclonal antibody against KillerRed and JRed	100 µg 200 µg	D-11

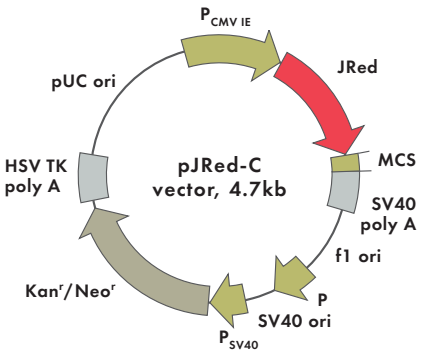
Please contact your local distributor for exact prices and delivery information.

Third party products: stably transfected cell lines expressing JRed

Cell line	Source	Description
W-JR	rat	WALKER 256 rat tumor cells expressing JRed in cytosol
PC-JR	rat	PC-12 rat pheochromocytoma expressing JRed in cytosol
H-JR	human	HeLa human cervical carcinoma expressing JRed in cytosol
T24-JR	human	T24 human bladder carcinoma expressing JRed in cytosol
T406-JR	human	T406 human glioma expressing JRed in cytosol
ARPE19-JR	human	ARPE19 human retina pigment cells expressing JRed in cytosol
CHO-JR	hamster	Chinese hamster ovary cells CHO-K1 expressing JRed in cytosol
M3-JR	mouse	M3 mouse melanoma cells expressing JRed in cytosol
C2-JR	mouse	C2C12 mouse myoblast cells expressing JRed in cytosol
M3-JR-PY-Mito	mouse	Doubly transfected mouse melanoma M3 cells expressing PhiYFP in mitochondria and JRed in cytosol
P-JR-Mito	rat	Rat kangaroo kidney epithelium PtK2 expressing JRed in mitochondria
ARPE19-JR-Mito	human	ARPE19 human retina pigment cells expressing JRed in mitochondria
H-JR-Mito	human	HeLa human cervical carcinoma expressing JRed in mitochondria
T24-JR-Mito	human	T24 human bladder carcinoma expressing JRed in mitochondria
M3-JR-Mito	mouse	Mouse melanoma M3 cells expressing JRed in mitochondria
Fluorescent BID apoptotic protein	human	T24 human carcinoma cells expressing JRed in mitochondria and TurboGFP-BID fusion

Cell lines are manufactured by Marinpharm GmbH (Berlin, Germany) under the Evrogen license.

Expression/source vectors: pJRed-C



For vector sequence, please visit our Web site at www.evrogen.com/pJRed-C.shtml

Product	Cat.#	Size
pJRed-C	FP701	20 µg

Please contact your local distributor for exact prices and delivery information.

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

Multiple cloning site (MCS)

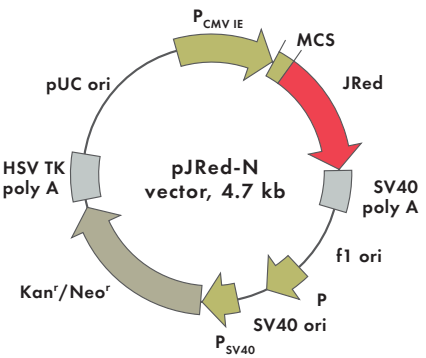
JRed → BspE1 BglII SacI EcoRI SalI KpnI ApaI BamHI STOPs

TCC.GGA.CTC.AGA.TCT.CGA.GCT.CAA.GCT.TCG.AAT.TCT.GCA.GTC.GAC.GGT.ACC.GCG.GGC.CCG.GGA.TCC.ACC.GGA.TCT.AGA.TAA.CTG.ATC.A

XhoI HindIII PstI SacII SmaI/XmaI XbaI# BclI#

— sites are blocked by methylation. If you wish to digest the vector using these sites, you will need to transform the vector into a dam- host and make fresh DNA.

Expression/source vectors: pJRed-N



For vector sequence, please visit our Web site at www.evrogen.com/pJRed-N.shtml

Product	Cat.#	Size
pJRed-N	FP702	20 µg

Please contact your local distributor for exact prices and delivery information.

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

Multiple cloning site (MCS)

NheI BglII SacI EcoRI SalI SacII SmaI/XmaI AgeI JRed →

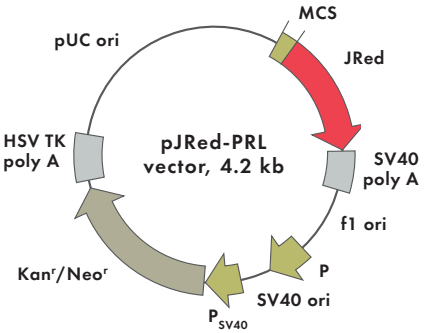
GCTA.GCG.CTA.CCG.GAC.TCA.GAT.CTC.GAG.CTC.AAG.CTT.CGA.ATT.CTG.CAG.TCG.ACG.GTA.CCG.CGG.GCC.CGG.GAT.CCA.CCG.GTC.GCC.ACC.ATG.G..

Eco47III XhoI HindIII PstI KpnI ApaI BamHI NcoI*

* — not unique sites.

Notice to Purchaser — please see page A-84

Expression/source vectors: pJRed-PRL



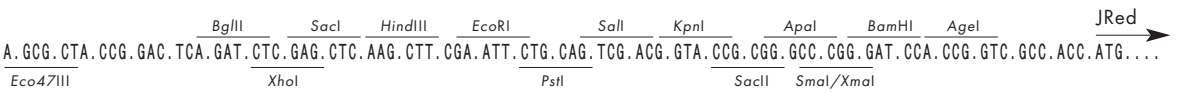
For vector sequence, please visit our Web site at www.evrogen.com/pJRed-PRL.shtml

Product	Cat.#	Size
pJRed-PRL	FP705	20 µg

Please contact your local distributor for exact prices and delivery information.

Vector type	promoterless vector
Reporter	JRed
Reporter codon usage	mammalian
Promoter for JRed	NO
Host cells	mammalian, bacterial
Selection	prokaryotic — kanamycin eukaryotic — neomycin (G418)
Replication	prokaryotic — pUC ori eukaryotic — SV40 ori
Use	monitoring the activity of promoter or promoter/enhancer combination cloned into vector MCS

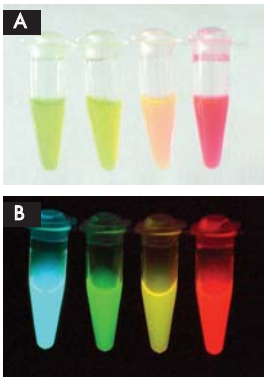
Multiple cloning site (MCS)



Notice to Purchaser:
JRed-related products: These products are intended for research use only and covered by 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 (Appendix A, page G-5).
CMV Promoter: 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.

MATERIAL SAFETY DATA SHEET INFORMATION
To the best of our knowledge, these products do not require a Material Safety Data Sheet. However, all the properties of these products (and, if applicable, each of their components) have not been thoroughly investigated. Therefore, we recommend that you use gloves and eye protection, and wear a laboratory coat when working with these products.

Basic fluorescent proteins: product list



Purified fluorescent proteins of different colors.
(A) — White light;
(B) — UV light.

Please see page A-88 for **Notice to purchaser** of Evrogen basic FP-related products

Expression/source vectors

For updated product information, please visit the Evrogen Web site (www.evrogen.com/v-info.shtml).

Product	Cat.#	Reporter	Use	Group	Size	Page
Bacterial expression vectors						
pTurboGFP-B	FP513	TurboGFP (green)	Source of the humanized TurboGFP coding sequence; TurboGFP expression in bacterial cells	Turbo Colors	20 µg	A-42
pTurboYFP-B	FP613	TurboYFP (yellow)	Source of the humanized TurboYFP coding sequence; TurboYFP expression in bacterial cells	Turbo Colors	20 µg	A-50
pTurboRFP-B	FP233	TurboRFP (red)	Source of the humanized TurboRFP coding sequence; TurboRFP expression in bacterial cells	Turbo Colors	20 µg	A-57
pTurboFP602-B	FP713	TurboFP602 (true-red)	Source of the humanized TurboFP602 coding sequence; TurboFP602 expression in bacterial cells	Turbo Colors	20 µg	A-64
pPhi-Yellow-B	FP603	PhiYFP (yellow)	Source of the humanized PhiYFP coding sequence; PhiYFP expression in bacterial cells	Other basic FPs	20 µg	A-76

... to be continued

Product	Cat.#	Reporter	Use	Group	Size	Page
Mammalian expression vectors for fusion construction						
pTagCFP-C	FP111	TagCFP (cyan)	TagCFP expression in mammalian cells; generation of fusions to the TagCFP C-terminus	TagFPs	20 µg	A-10
pTagGFP-C	FP121	TagGFP (green)	TagGFP expression in mammalian cells; generation of fusions to the TagGFP C-terminus	TagFPs	20 µg	A-16
pTagYFP-C	FP131	TagYFP (yellow)	TagYFP expression in mammalian cells; generation of fusions to the TagYFP C-terminus	TagFPs	20 µg	A-22
pTagRFP-C	FP141	TagRFP (red)	TagRFP expression in mammalian cells; generation of fusions to the TagRFP C-terminus	TagFPs	20 µg	A-28
pTagFP635-C	FP161	TagFP635 (far-red)	TagFP635 expression in mammalian cells; generation of fusions to the TagFP635 C-terminus	TagFPs	20 µg	A-33
pTurboGFP-C	FP511	TurboGFP (green)	TurboGFP expression in mammalian cells; generation of fusions to the TurboGFP C-terminus	Turbo Colors	20 µg	A-41
pTurboYFP-C	FP611	TurboYFP (yellow)	TurboYFP expression in mammalian cells; generation of fusions to the TurboYFP C-terminus	Turbo Colors	20 µg	A-49
pTurboRFP-C	FP231	TurboRFP (red)	TurboRFP expression in mammalian cells; generation of fusions to the TurboRFP C-terminus	Turbo Colors	20 µg	A-56
pTurboFP602-C	FP711	TurboFP602 (true-red)	TurboFP602 expression in mammalian cells; generation of fusions to the TurboFP602 C-terminus	Turbo Colors	20 µg	A-63
pTurboFP635-C	FP721	TurboFP635 (far-red)	TurboFP635 expression in mammalian cells; generation of fusions to the TurboFP635 C-terminus	Turbo Colors	20 µg	A-68
pPhi-Yellow-C	FP601	PhiYFP-m (yellow)	PhiYFP-m expression in mammalian cells; generation of fusions to the PhiYFP-m C-terminus	Other basic FPs	20 µg	A-75
pJRed-C	FP701	JRed (red)	JRed expression in mammalian cells; generation of fusions to the JRed C-terminus	Other basic FPs	20 µg	A-83
pTagCFP-N	FP112	TagCFP (cyan)	TagCFP expression in mammalian cells; generation of fusions to the TagCFP N-terminus	TagFPs	20 µg	A-10

Product	Cat.#	Reporter	Use	Group	Size	Page
pTagGFP-N	FP122	TagGFP (green)	TagGFP expression in mammalian cells; generation of fusions to the TagGFP N-terminus	TagFPs	20 µg	A-16
pTagYFP-N	FP132	TagYFP (yellow)	TagYFP expression in mammalian cells; generation of fusions to the TagYFP N-terminus	TagFPs	20 µg	A-22
pTagRFP-N	FP142	TagRFP (red)	TagRFP expression in mammalian cells; generation of fusions to the TagRFP N-terminus	TagFPs	20 µg	A-28
pTagFP635-N	FP162	TagFP635 (far-red)	TagFP635 expression in mammalian cells; generation of fusions to the TagFP635 N-terminus	TagFPs	20 µg	A-34
pTurboGFP-N	FP512	TurboGFP (green)	TurboGFP expression in mammalian cells; generation of fusions to the TurboGFP N-terminus	Turbo Colors	20 µg	A-41
pTurboYFP-N	FP612	TurboYFP (yellow)	TurboYFP expression in mammalian cells; generation of fusions to the TurboYFP N-terminus	Turbo Colors	20 µg	A-49
pTurboRFP-N	FP232	TurboRFP (red)	TurboRFP expression in mammalian cells; generation of fusions to the TurboRFP N-terminus	Turbo Colors	20 µg	A-56
pTurboFP602-N	FP712	TurboFP602 (true-red)	TurboFP602 expression in mammalian cells; generation of fusions to the TurboFP602 N-terminus	Turbo Colors	20 µg	A-63
pTurboFP635-N	FP722	TurboFP635 (far-red)	TurboFP635 expression in mammalian cells; generation of fusions to the TurboFP635 N-terminus	Turbo Colors	20 µg	A-68
pPhi-Yellow-N	FP602	PhiYFP (yellow)	PhiYFP expression in mammalian cells; generation of fusions to the PhiYFP N-terminus	Other basic FPs	20 µg	A-75
pJRed-N	FP702	JRed (red)	JRed expression in mammalian cells; generation of fusions to the JRed N-terminus	Other basic FPs	20 µg	A-83
Mammalian expression vectors encoding destabilized fluorescent proteins						
pTurboGFP-dest1	FP519	TurboGFP-dest1 (green)	TurboGFP-dest1 expression in mammalian cells; generation of fusions to the TurboGFP-dest1 N-terminus	Turbo Colors	20 µg	A-43

... to be continued

Product	Cat.#	Reporter	Use	Group	Size	Page
pTurboYFP-dest1	FP619	TurboYFP-dest1 (yellow)	TurboYFP-dest1 expression in mammalian cells; generation of fusions to the TurboYFP-dest1 N-terminus	Turbo Colors	20 µg	A-51
pTurboRFP-dest1	FP239	TurboRFP-dest1 (red)	TurboRFP-dest1 expression in mammalian cells; generation of fusions to the TurboRFP-dest1 N-terminus	Turbo Colors	20 µg	A-58
pPhi-Yellow-dest1	FP608	PhiYFP-m-dest1 (yellow)	PhiYFP-m-dest1 expression in mammalian cells; generation of fusions to the reporter	Other basic FPs	20 µg	A-77
Promoterless vectors						
pTurboGFP-PRL	FP515	TurboGFP (green)	Monitoring transcription from different promoters and promoter/enhancer combinations	Turbo Colors	20 µg	A-42
pTurboYFP-PRL	FP615	TurboYFP (yellow)	Monitoring transcription from different promoters and promoter/enhancer combinations	Turbo Colors	20 µg	A-50
pTurboRFP-PRL	FP235	TurboRFP (red)	Monitoring transcription from different promoters and promoter/enhancer combinations	Turbo Colors	20 µg	A-57
pTurboFP602-PRL	FP715	TurboFP602 (true-red)	Monitoring transcription from different promoters and promoter/enhancer combinations	Turbo Colors	20 µg	A-64
pPhi-Yellow-PRL	FP604	PhiYFP (yellow)	Monitoring transcription from different promoters and promoter/enhancer combinations	Other Colors	20 µg	A-76
pJRed-PRL	FP705	JRed (true-red)	Monitoring transcription from different promoters and promoter/enhancer combinations	Other basic FPs	20 µg	A-84
Promoterless vectors encoding destabilized fluorescent proteins						
pTurboGFP-PRL-dest1	FP518	TurboGFP-dest1 (green)	Monitoring transcription from different promoters and promoter/enhancer combinations	Turbo Colors	20 µg	A-43
pTurboYFP-PRL-dest1	FP618	TurboYFP-dest1 (yellow)	Monitoring transcription from different promoters and promoter/enhancer combinations	Turbo Colors	20 µg	A-51
pTurboRFP-PRL-dest1	FP238	TurboRFP-dest1 (red)	Monitoring transcription from different promoters and promoter/enhancer combinations	Turbo Colors	20 µg	A-58

Product	Cat.#	Reporter	Use	Group	Size	Page
pPhi-Yellow-PRL-dest1	FP605	PhiYFP-m dest1 (yellow)	Monitoring transcription from different promoters and promoter/enhancer combinations	Other basic FPs	20 µg	A-77
Subcellular localization vectors						
pTagCFP-actin	FP114	TagCFP (cyan)	Cyan fluorescent labeling of beta-actin filaments	TagFPs	20 µg	A-11
pTagGFP-actin	FP124	TagGFP (green)	Green fluorescent labeling of beta-actin filaments	TagFPs	20 µg	A-17
pTagYFP-actin	FP134	TagYFP (yellow)	Yellow fluorescent labeling of beta-actin filaments	TagFPs	20 µg	A-23
pTagRFP-actin	FP144	TagRFP (red)	Red fluorescent labeling of beta-actin filaments	TagFPs	20 µg	A-29
pTagCFP-tubulin	FP115	TagCFP (cyan)	Cyan fluorescent labeling of alpha-tubulin filaments	TagFPs	20 µg	A-11
pTagGFP-tubulin	FP125	TagGFP (green)	Green fluorescent labeling of alpha-tubulin filaments	TagFPs	20 µg	A-17
pTagYFP-tubulin	FP135	TagYFP (yellow)	Yellow fluorescent labeling of alpha-tubulin filaments	TagFPs	20 µg	A-23
pTagRFP-tubulin	FP145	TagRFP (red)	Red fluorescent labeling of alpha-tubulin filaments	TagFPs	20 µg	A-29
pTagCFP-mito	FP117	TagCFP (cyan)	Cyan fluorescent labeling of mitochondria	TagFPs	20 µg	A-12
pTagGFP-mito	FP127	TagGFP (green)	Green fluorescent labeling of mitochondria	TagFPs	20 µg	A-18
pTagYFP-mito	FP137	TagYFP (yellow)	Yellow fluorescent labeling of mitochondria	TagFPs	20 µg	A-24
pTagRFP-mito	FP147	TagRFP (red)	Red fluorescent labeling of mitochondria	TagFPs	20 µg	A-30
pTurboGFP-mito	FP517	TurboGFP (green)	Green fluorescent labeling of mitochondria	Turbo Colors	20 µg	A-44
pTurboRFP-mito	FP237	TurboRFP (red)	Red fluorescent labeling of mitochondria	Turbo Colors	20 µg	A-59
pTurboFP602-mito	FP717	TurboFP602 (true-red)	Red fluorescent labeling of mitochondria	Turbo Colors	20 µg	A-65
pPhi-Yellow-mito	FP607	PhiYFP (yellow)	Yellow fluorescent labeling of mitochondria	Other basic FPs	20 µg	A-78
pPhi-Yellow-peroxi	FP606	PhiYFP-m (yellow)	Yellow fluorescent labeling of peroxisomes	Other basic FPs	20 µg	A-78
Gateway® entry clones						
Gateway® TurboGFP-C	FP521	TurboGFP (green)	Generation of fusions to the C-terminus of humanized TurboGFP; transfer of TurboGFP or its fusion into a Gateway® destination vector	Turbo Colors	20 µg	A-44

... to be continued

Product	Cat.#	Reporter	Use	Group	Size	Page
Gateway® TurboGFP-N	FP522	TurboGFP (green)	Generation of fusions to the N-terminus of humanized TurboGFP; transfer of TurboGFP or its fusion into a Gateway® destination vector	Turbo Colors	20 µg	A-45

Please contact your local distributor for exact prices and delivery information.

Vector sets

Vector set	Composition	Cat.#	Size	Pages
Promoter-tracker Green vector set		**FPP03**		
	pTurboGFP-PRL vector	FP515	20 µg	A-42
	pTurboGFP-PRL-dest1 vector	FP518	20 µg	A-43
	pTurboGFP-dest1 vector	FP519	20 µg	A-43
Promoter-tracker Yellow vector set		**FPP14**		
	pTurboYFP-PRL vector	FP615	20 µg	A-50
	pTurboYFP-PRL-dest1 vector	FP618	20 µg	A-51
	pTurboYFP-dest1 vector	FP619	20 µg	A-51
Promoter-tracker 3-colors vector set		**FPP15**		
	pTurboRFP-PRL vector	FP235	20 µg	A-57
	pTurboYFP-PRL vector	FP615	20 µg	A-50
	pTurboGFP-PRL vector	FP515	20 µg	A-42
Mito-tracker vector set		**FPM01**		
	pTurboGFP-mito vector	FP517	20 µg	A-44
	pPhi-Yellow-mito vector	FP607	20 µg	A-78
	pKindling-Red-mito vector	FP401	20 µg	B-27
Fusion Cyan vector set		**FPF11**		
	pTagCFP-C vector	FP111	20 µg	A-10
	pTagCFP-N vector	FP112	20 µg	A-10
Fusion Green vector set		**FPF12**		
	pTagGFP-C vector	FP121	20 µg	A-16
	pTagGFP-N vector	FP122	20 µg	A-16
Fusion Yellow vector set		**FPF13**		
	pTagYFP-C vector	FP131	20 µg	A-22
	pTagYFP-N vector	FP132	20 µg	A-22
Fusion Red vector set		**FPF14**		
	pTagRFP-C vector	FP141	20 µg	A-28
	pTagRFP-N vector	FP142	20 µg	A-28

Please contact your local distributor for exact prices and delivery information.

Recombinant proteins

For updated product information, please visit the Evrogen Web site (www.evrogen.com/p1_BFP.shtml).

Product	Cat.#	Description	Size	Page
rTagCFP	FP151	Purified recombinant cyan fluorescent protein TagCFP	100 µg	A-12
rTagGFP	FP152	Purified recombinant green fluorescent protein TagGFP	100 µg	A-18
rTagYFP	FP153	Purified recombinant yellow fluorescent protein TagYFP	100 µg	A-24
rTagRFP	FP154	Purified recombinant red fluorescent protein TagRFP	100 µg	A-30
rTurboGFP	FP552	Purified recombinant green fluorescent protein TurboGFP	100 µg	A-45
rTurboYFP	FP652	Purified recombinant yellow fluorescent protein TurboYFP	100 µg	A-52
rTurboRFP	FP252	Purified recombinant red fluorescent protein TurboRFP	100 µg	A-59
rTurboFP602	FP751	Purified recombinant red fluorescent protein TurboFP602	100 µg	A-65
rPhiYFP	FP651	Purified recombinant yellow fluorescent protein PhiYFP	100 µg	A-79

Please contact your local distributor for exact prices and delivery information.

Antibodies against Evrogen basic FPs

For updated product information, please visit the Evrogen Web site (www.evrogen.com/AB.shtml).

Product	Cat.#	Description	Size	Page
Anti-TurboGFP antibody	AB511 AB512	Rabbit polyclonal antibody against non-denatured TurboGFP; it also recognizes denatured TurboGFP but with lesser affinity than Anti-TurboGFP(d) antibody	100 µg 200 µg	D-3
Anti-TurboGFP(d) antibody	AB513 AB514	Rabbit polyclonal antibody against denatured TurboGFP and CopGFP; it also recognizes non-denatured TurboGFP but with lesser affinity than Anti-TurboGFP antibody	100 µg 200 µg	D-4
Anti-PhiYFP antibody	AB601 AB602	Rabbit polyclonal antibody against non-denatured PhiYFP, PhiYFP-m, and TurboYFP	100 µg 200 µg	D-7
Anti-PhiYFP(d) antibody	AB603 AB604	Rabbit polyclonal antibody against denatured PhiYFP, PhiYFP-m, and TurboYFP; it also recognizes non-denatured TurboYFP and Phi-Yellow proteins, but with lesser affinity than Anti-PhiYFP antibody	100 µg 200 µg	D-8
Anti-tRFP antibody	AB231 AB232	Rabbit polyclonal antibody against TagRFP, TagFP635 TurboRFP, TurboFP602, and TurboFP635 proteins	100 µg 200 µg	D-9
Anti-Tag(CGY)FP antibody	AB121 AB122	Rabbit polyclonal antibody against TagGFP, TagCFP, TagYFP and PS-CFP2	100 µg 200 µg	D-6
Anti-KillerRed antibody	AB961 AB962	Rabbit polyclonal antibody against KillerRed and JRed	100 µg 200 µg	D-11

Please contact your local distributor for exact prices and delivery information.

Third party products: stably transfected cell lines

Cell line	Reporter	Description
Whole cell labeling		
M3-TG	green	M3 mouse melanoma cells expressing TurboGFP in cytosol
M3-PY	yellow	M3 mouse melanoma cells expressing PhiYFP in cytosol
M3-JR	red	M3 mouse melanoma cells expressing JRed in cytosol
PC-TG	green	PC-12 rat pheochromocytoma expressing TurboGFP in cytosol
PC-PY	yellow	PC-12 rat pheochromocytoma expressing PhiYFP in cytosol
PC-JR	red	PC-12 rat pheochromocytoma expressing JRed in cytosol
CHO-TG	green	Chinese hamster ovary cells CHO-K1 expressing TurboGFP in cytosol
CHO-JR	red	Chinese hamster ovary cells CHO-K1 expressing JRed in cytosol
H460-TG	green	H460 human lung carcinoma expressing TurboGFP in cytosol
Ut7-TG	green	UT7 human leukemia cells expressing TurboGFP in cytosol
H-TG	green	HeLa human cervical carcinoma expressing TurboGFP in cytosol
H-JR	red	HeLa human cervical carcinoma expressing JRed in cytosol
C2-TG	green	C2C12 mouse myoblast cells expressing TurboGFP in cytosol
C2-JR	red	C2C12 mouse myoblast cells expressing JRed in cytosol
W-TG	green	WALKER 256 rat tumor expressing TurboGFP in cytosol
W-PY	yellow	WALKER 256 rat tumor expressing PhiYFP in cytosol
W-JR	red	WALKER 256 rat tumor cells expressing JRed in cytosol
3T3-TG	green	3T3 mouse fibroblasts expressing TurboGFP in cytosol
3T3-TG-D	green	T3-mouse fibroblasts expressing destabilized TurboGFP in cytosol
T406-PY	yellow	T406 human glioma expressing PhiYFP in cytosol
T406-JR	red	T406 human glioma expressing JRed in cytosol
BC3-PY	yellow	BC3H1 myoblast cells expressing PhiYFP in cytosol
T24-TG	green	T24 human bladder carcinoma expressing TurboGFP in cytosol
T24-PY	yellow	T24 human bladder carcinoma expressing PhiYFP in cytosol
T24-JR	red	T24 human bladder carcinoma expressing JRed in cytosol
T24-PY-dest	yellow	Rat kangaroo kidney epithelium PtK2 cells expressing destabilized PhiYFP-m in cytosol
ARPE19-JR	red	ARPE19 human retina pigment cells expressing JRed in cytosol
Mitochondria labeling		
H-TG-Mito	green	HeLa human cervical carcinoma expressing TurboGFP in mitochondria
H-JR-Mito	red	HeLa human cervical carcinoma expressing JRed in mitochondria
T24-TG-Mito	green	T24 human bladder carcinoma expressing TurboGFP in mitochondria
T24-JR-Mito	red	T24 human bladder carcinoma expressing JRed in mitochondria
M3-TG-Mito	green	M3 mouse melanoma cells expressing TurboGFP in mitochondria
M3-JR-Mito	red	Mouse melanoma M3 cells expressing JRed in mitochondria
M3-JR-PY-Mito	yellow and red	Doubly transfected mouse melanoma M3 cells expressing PhiYFP in mitochondria and JRed in cytosol
C2C12-PY-Mito	yellow	Mouse myoblast cells expressing PhiYFP in mitochondria
3T3-PY-Mito	yellow	Mouse fibroblasts 3T3 expressing PhiYFP in mitochondria
P-PY-Mito	yellow	Rat kangaroo kidney epithelium PtK2 expressing PhiYFP in mitochondria
P-JR-Mito	red	Rat kangaroo kidney epithelium PtK2 expressing JRed in mitochondria
ARPE19-JR-Mito	red	ARPE19 human retina pigment cells expressing JRed in mitochondria
Peroxisome labeling		
T24-PY-P	yellow	T24 human bladder carcinoma cells expressing PhiYFP-m in peroxisomes
Beta-actin labeling		
HeLa-TurboGreen-Actin	green	HeLa human cervical carcinoma expressing TurboGFP fusion with beta-actin
H-PY-A	yellow	HeLa human cervical carcinoma expressing PhiYFP-m fusion with beta-actin

Cell line	Reporter	Description
P-PY-A	yellow	Rat kangaroo kidney epithelium PtK2 expressing PhiYFP-m fusion with beta-actin
T47-PY-A	yellow	T47-D T47-D human breast cancer cells expressing PhiYFP-m fusion with beta-actin
MDCK-PY-A	yellow	MADIN-DARBY-canine kidney epithelial cells expressing PhiYFP-m fusion with beta-actin
3T3-PY-A	yellow	Mouse fibroblasts 3T3 expressing PhiYFP-m fusion with beta-actin
U205-TAG-GFP-Actin	green	Human osteosarcoma line U205 expressing TagGFP fusion with beta-actin
U205-TAG-YFP-Actin	yellow	Human osteosarcoma line U205 expressing TagYFP fusion with beta-actin
U205-TAG-RFP-Actin	red	Human osteosarcoma line U205 expressing TagRFP fusion with beta-actin
Alpha-tubulin labeling		
MDCK-TAG-Tu	green	MDCK canine kidney epithelial cells expressing TagGFP fusion with alpha-tubulin
T24-TG-TAG-Tu	green	T24 human bladder carcinoma expressing TagGFP fusion with alpha-tubulin
U205-TAG-RFP-Tubulin	red	Human osteosarcoma line U205 expressing TagRFP fusion with beta-actin
Other constructs		
Fluorescent BID-apoptotic protein	red and green	Doubly transfected T24 human carcinoma cells expressing JRed in mitochondria and TurboGFP-BID fusion
Fluorescent fibrillarin	green	HeLa human cervical carcinoma expressing TurboGFP fusion with fibrillarin

Cell lines are manufactured by Marinpharm GmbH (Berlin, Germany) under the Evrogen license.