

## Green fluorescent protein TagGFP

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

### Description

TagGFP is an enhanced mutant of wild-type GFP-like protein from jellyfish *Aequorea macrodactyla* (Xia *et al.*, 2002). 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.

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.

### 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 <sup>-1</sup> cm <sup>-1</sup>
Brightness*	34.3
Brightness % of EGFP	104
pKa	4.7
Structure	monomer
Aggregation	no
Maturation rate at 37°C	fast
Photostability	high

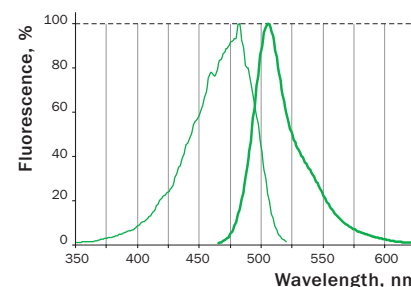
\*Brightness is a product of extinction coefficient and quantum yield, divided by 1000.

### Performance and use

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.

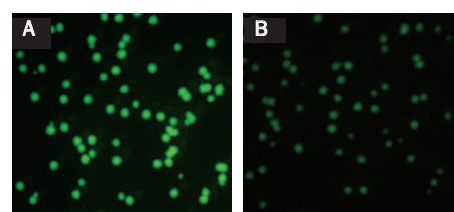
Mammalian cells transiently transfected with TagGFP expression vectors give bright fluorescent signals in 10-12 hrs after transfection. No cell toxic effects and visible protein aggregation are observed.

TagGFP performance in fusions has been demonstrated in the beta-actin and alpha-tubulin models.

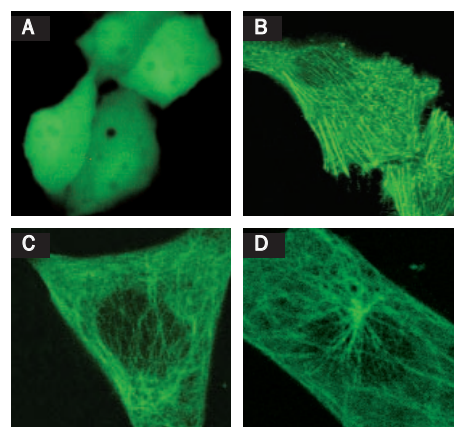


**TagGFP normalized excitation (thin line) and emission (thick line) spectra.**

Complete TagGFP spectra in Excel format can be downloaded from the Evrogen Web site at [www.evrogen.com/TagGFP.shtml](http://www.evrogen.com/TagGFP.shtml)



**TagGFP (A) and EGFP (B) expression in *E. coli*, 10 hrs after transformation.**



**TagGFP use for cell and protein labeling in transiently transfected mammalian cells (HeLa).**

A — Whole-cell expression; B — expression of TagGFP fusion with human beta-actin; C, D — expression of TagGFP fusion with human alpha-tubulin.

TagGFP suitability to generate stably transfected cells has been proven by Marinpharm company ([www.marinpharm.com](http://www.marinpharm.com)). Cell lines expressing TagGFP fusion with beta-actin and alpha-tubulin are commercially available. TagGFP can be used in multicolor labeling applications with cyan, yellow, red, and far-red fluorescent dyes.

### Available variants and fusions

TagGFP codon usage is optimized for high expression in mammalian cells (Haas *et al.*, 1996), but it can be successfully expressed in many other heterologous systems.

#### TagGFP-mito fusion

A mitochondrial targeting sequence (MTS) is linked to the TagGFP N-terminus. MTS was derived from the subunit VIII of human cytochrome C oxidase (Rizzuto *et al.*, 1989; Rizzuto *et al.*, 1995). When expressed in mammalian cells, this variant provides green fluorescent labeling of mitochondria.

#### TagGFP-actin fusion

Human beta-actin is linked to the TagGFP C-terminus. When expressed in mammalian cells, this fusion provides green fluorescent labeling of actin filaments.

#### TagGFP-tubulin fusion

Human alpha-tubulin is linked to the TagGFP C-terminus. When expressed in mammalian cells, this fusion provides green fluorescent labeling of tubulin filaments.

### Recommended filter sets and antibodies

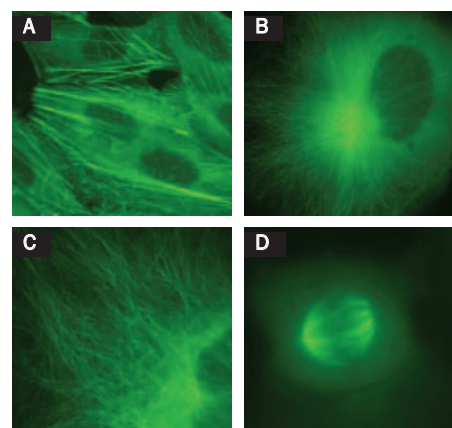
TagGFP and its fusions can be detected using common fluorescence filter sets for EGFP, FITC, and other green dyes. Recommended Omega Optical filter sets are QMAX-Green, XF100-2, XF100-3, XF115-2, and XF116-2.

The protein can be recognized using Anti-Tag(CGY)FP antibody (Cat.# AB121-AB122) 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](mailto: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*.



### TagGFP expression in stably transfected mammalian cells.

A — U-205 human osteosarcoma cells expressing TagGFP fusion with beta-actin; B — T24 cells expressing TagGFP fusion with alpha-tubulin; C, D — MDCK canine kidney epithelial cells expressing TagGFP fusion with alpha-tubulin; interphase (C) and metaphase (D). Photographs of stably transfected cell lines were provided by Dr. Christian Petzelt (Marinpharm).

### References

- Haas *et al.* (1996) *Curr. Biol.* 6: 315–324.
- Rizzuto *et al.* (1989) *J. Biol. Chem.* 264: 10595–10600.
- Rizzuto *et al.* (1995) *Curr. Biol.* 5: 635–642.
- Xia *et al.* (2002) *Mar. Biotechnol.* 4(2): 155-162.

## TagGFP-related products

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

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

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### Notice to Purchaser:

TagGFP-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 (available at [www.evrogen.com/11.shtml](http://www.evrogen.com/11.shtml)).  
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