

# pFUSE-CHlg-rhG2

Plasmid featuring the constant region of rhesus monkey (*Macaca mulatta*) IgG2 heavy chain

Catalog # pfuse-rhchg2

For research use only

Version 20J28-MMv41

## PRODUCT INFORMATION

### Content:

- 20 µg of pFUS E-CHlg-rhG2 plasmid provided as lyophilized DNA.
- 1 ml of Zeocin™ (100 mg/ml)

### Storage and Stability:

- Product is shipped at room temperature.
- Lyophilized DNA should be stored at -20°C.
- Resuspended DNA should be stored at -20°C and is stable up to 1 year.
- Store Zeocin™ at 4 °C or at -20 °C. The expiry date is specified on the product label.

### Quality control:

- Plasmid construct has been confirmed by restriction analysis and sequencing.
- Plasmid DNA was purified by ion exchange chromatography.

### Materials required for antibody generation & isotype switching

- pFUSE2-CLlg plasmid that features the constant region of a rhesus monkey light chain. pFUSE2-CLlg plasmids are selectable with blasticidin (sold separately, see RELATED PRODUCTS).
- pFUSE-CHlg plasmid for the constant region of the heavy chain, this plasmid is selectable with Zeocin™.

## GENERAL PRODUCT USE

pFUSE-CLlg and pFUSE-CHlg plasmids are designed to change a monoclonal antibody from one isotype to another, therefore, enabling the generation of antibodies with the same antigen affinity but with different effector functions (increased or reduced ADCC and CDC). Furthermore, they can be used to produce entire IgG antibodies from Fab or scFv fragments.

pFUSE-CHlg and pFUSE2-CLlg express the constant regions of the heavy (CH) and light (CL) chains, respectively. They contain a multiple cloning site (MCS) upstream of these constant regions to enable the cloning of the variable (VH and VL) regions of a given antibody. Transfection of mammalian cell lines with the recombinant pFUSE-CHlg and pFUSE2-CLlg pair allows to generate an IgG antibody that can be purified from the supernatant using the appropriate Protein A, Protein G or Protein L affinity chromatography.

## Features of pFUSE-CHlg and pFUSE2-CLlg plasmids

- **hEF1-HTLV prom** is a composite promoter comprising the Elongation Factor-1α (EF-1α) core promoter<sup>1</sup> and the R segment and part of the U5 sequence (R-U5') of the Human T-Cell Leukemia Virus (HTLV) Type 1 Long Terminal Repeat<sup>2</sup>. The EF-1α promoter exhibits a strong activity and yields long lasting expression of a transgene *in vivo*. The R-U5' has been coupled to the EF-1α core promoter to enhance stability of RNA.
- **MCS:** The multiple cloning site contains several restriction sites that are compatible with many other enzymes, thus facilitating cloning.
- **SV40 pAn:** the Simian Virus 40 late polyadenylation signal enables efficient cleavage and polyadenylation reactions resulting in high levels of steady-state mRNA<sup>3</sup>.
- **ori:** a minimal *E. coli* origin of replication to limit vector size, but with the same activity as the longer Ori.
- **CMV enh / hFerL prom:** This composite promoter combines the human cytomegalovirus immediate-early gene 1 enhancer and the core promoter of the human ferritin light chain gene. This ubiquitous promoter drives the expression of the Zeocin™-resistance gene in mammalian cells.
- **EM2KC** is a bacterial promoter that enables the constitutive expression of the antibiotic resistance gene in *E. coli*. EM2KC is located within an intron and is spliced out in mammalian cells.
- **βGlo pAn:** The human beta-globin 3'UTR and polyadenylation sequence allows efficient arrest of the transgene transcription<sup>4</sup>.

## pFUSE-CHlg-rhG2 specific features

- **Rhesus monkey IGHG2 (IgG2 heavy chain constant region):** When cloning your heavy chain variable region of choice in the MCS, care must be taken to insert the gene in-frame and to preserve the integrity of the heavy chain constant region.
- **Zeo:** Resistance to Zeocin™ is conferred by the *Sh ble* gene from *Streptoaloteichus hindustanus*. The same resistance gene confers selection in both mammalian cells and *E. coli*.

### References:

1. Kim DW. *et al.* 1990. Use of the human elongation factor 1 alpha promoter as a versatile and efficient expression system. *Mol Cell Biol.* 10(2):217-23.
2. Takebe Y. *et al.* 1988. SR alpha promoter: an efficient and versatile mammalian cDNA expression system composed of the simian virus 40 early promoter and the R-U5 segment of human T-cell leukemia virus type 1 long terminal repeat. *Mol Cell Biol.* 8(1):466-72.
3. Carswell S. & Alwine JC. 1989. Efficiency of utilization of the simian virus 40 late polyadenylation site: effects of upstream sequences. *Mol Cell Biol.* 9(10):4248-58.
4. Yu J. & Russell JE. 2001. Structural and functional analysis of an mRNP complex that mediates the high stability of human beta-globin mRNA. *Mol Cell Biol.* 21(17):5879-88.

### TECHNICAL SUPPORT

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## PROTOCOL

### Obtaining VH and VL sequences

To obtain the cDNA sequence of the VH and VL regions from an antibody producing hybridoma, total RNA or mRNA is extracted and reverse transcribed to cDNA. PCR is performed with 5' degenerate primers to anneal to the unknown VH and VL regions and the 3' primers designed to anneal to the "known" CH and CL regions. Alternatively 5' RACE can be used. The resulting amplicons must be sequenced.

### Plasmid resuspension

Quickly spin the tube containing the lyophilized plasmid to pellet the DNA. To obtain a plasmid solution at 1  $\mu\text{g}/\mu\text{l}$ , resuspend the DNA in 20  $\mu\text{l}$  of sterile H<sub>2</sub>O. Store resuspended plasmid at -20°C.

### Cloning into pFUSE-CHIg and pFUSE2-CLiG

Once the VH and VL sequences are known, inserts for cloning into the plasmids can be generated. In pFUSE-CHIg-rhG2, the constant region of rhesus monkey IgG2 heavy chain is preceded by a multiple cloning site containing six unique restriction sites: AgeI, EcoRI, EcoRV, XhoI, Eco47III, and NheI. The first 4 restriction sites can be used for insertion of the 5' end of the variable region including the native signal sequence. If the immunoglobulin signal sequence is unknown, pFUSEs plasmids containing a signal sequence should be used.

In pFUSE-CHIg-rhG2, use NheI as the VH 3' cloning site in order to preserve the IgG2 constant domain amino acid sequence. Alternatively, Eco47III can be used as 3' site.

NB: Care must be taken to preserve the reading frame.

When generating the insert for V $\kappa$  (pFUSE2-CLiG-rhK), a BstAPI site must be introduced at the 3' end. There is a choice of restriction sites at the 5' end.

*Note: The 5' end of the variable region should encompass the native ATG initiation codon and the region immediately after which corresponds to the signal sequence. For proper initiation of translation, make sure that your insert contains a Kozak translation initiation sequence upstream of the ATG, such as (G/A)NNATGG.*

### Antibody production

Cotransfect mammalian cells, such as 293 and CHO cells, with the recombinant plasmids pFUSE2-CLiG encoding the light chain and pFUSE-CHIg encoding the heavy chain. Antibody production depends greatly on the ratio of heavy chain and light chain expression. Typically, pFUSE-CHIg to pFUSE2-CLiG ratio of 2:3 is used to cotransfect mammalian cells. Since both plasmids share the same plasmid backbone, the appropriate heavy chain to light chain ratio can be easily determined by varying the quantities of plasmids.

OR

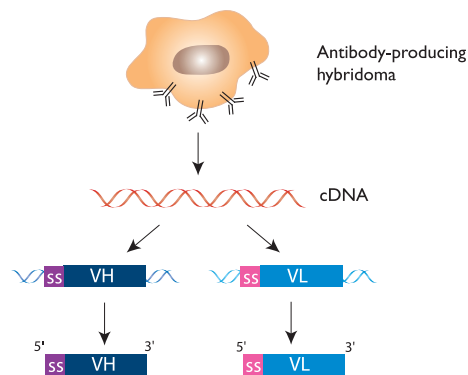
Transfect cells using a transfection agent, such as LyoVec™, with the plasmid coding for light chain and select the best clone. Following selection of the best clone, the plasmid coding for the heavy chain clone can be transfected into this clone.

Use blasticidin and Zeocin™ to select pFUSE2-CLiG and pFUSE-CHIg respectively.

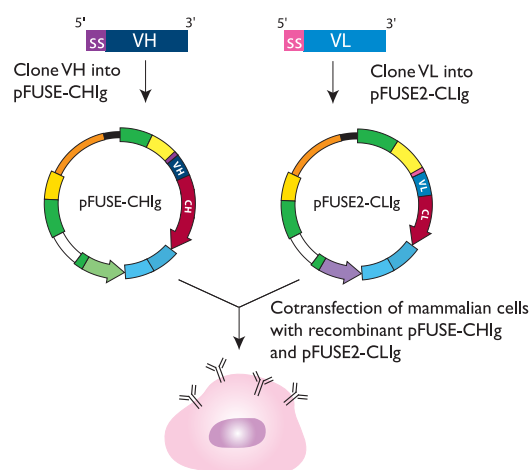
Antibody production can be analyzed by different techniques including SDS-PAGE, flow cytometry, ELISA, or a bioactivity assay.

## Antibody generation using pFUSE-CHIg & pFUSE2-CLiG

### 1- Obtention of VH and VL sequences



### 2- Cloning into pFUSE-CHIg and pFUSE2-CLiG



### Antibody purification

The resulting IgG antibody can be purified from the supernatant using the appropriate Protein A, Protein G or Protein L affinity chromatography.

## RELATED PRODUCTS

Product	Catalog Code
pFUSE2-CLiG-rhK	pfuse2-rhclk
pFUSE-CHIg-rhG1	pfuse-rhchg1
pFUSE-CHIg-rhG3	pfuse-rhchg3
pFUSE-CHIg-rhG4	pfuse-rhchg4
LyoVec™	lyec-12
Protein L / Agarose	gel-protl-2
Protein G / Agarose	gel-agg-5
Zeocin™	ant-zn-1

### TECHNICAL SUPPORT

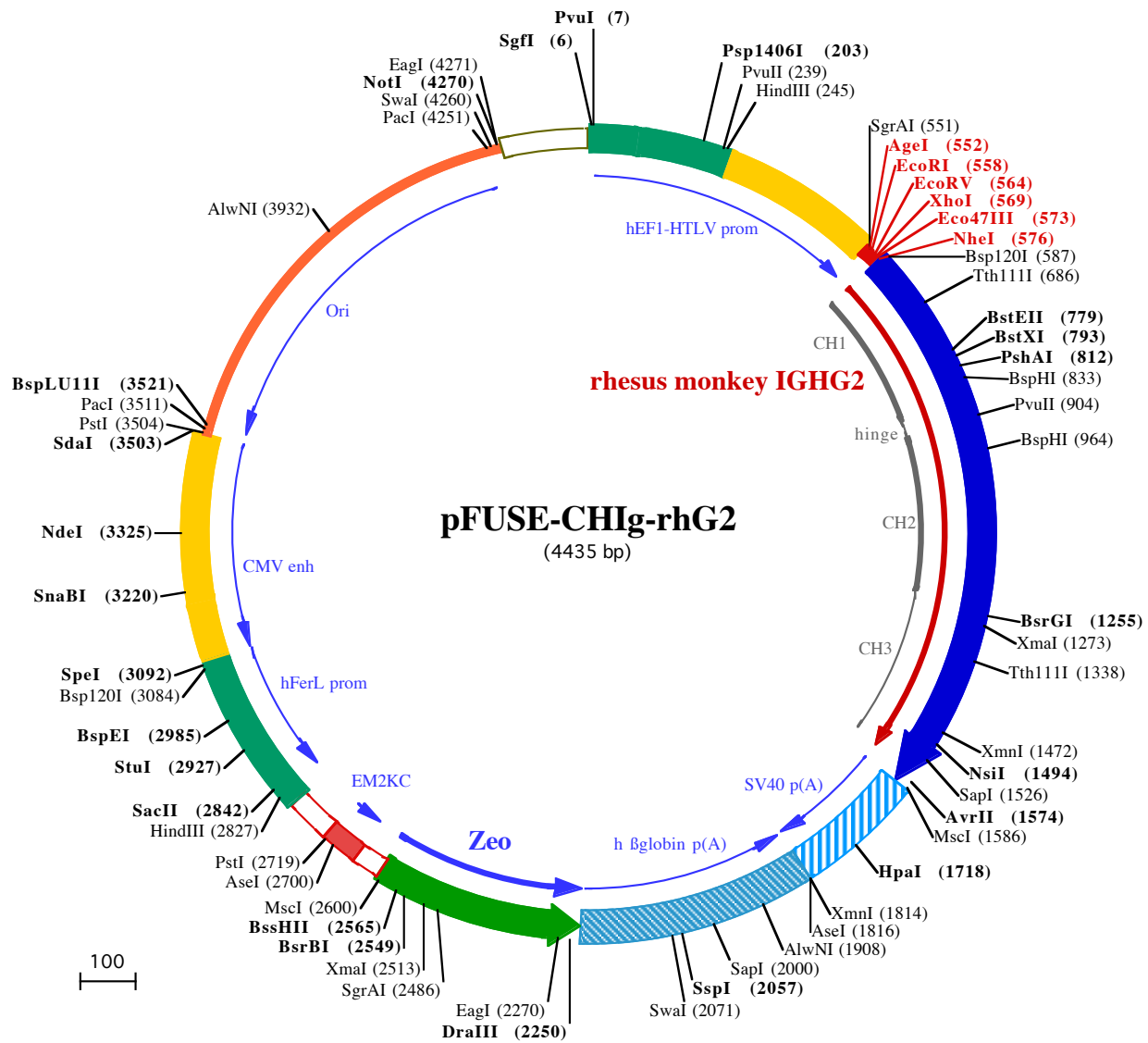
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**PvuI (7)**  
**SgfI (6)**  
1 GGATCTGCATCGCTCCGGTGCCCGTCAGTGGGAGAGCGCACATCGCCACAGTCCCCGAGAAGTTGGGGGAGGGGTGGCAATTGAACGGGTGCCTA  
101 GAGAAGGTGGCGCGGGTAAACTGGAAAGTGATGTCGTGTAAGTGGCTCCGCCTTTTCCGAGGGTGGGGGAGAACCGTATATAAGTGCAGTAGTCGCC

**HindIII (245)**  
**Psp1406I (203)** **PvuII (239)**  
201 GTGAACGTTCTTTTTCGCAACGGGTTTCCGCCAGAACACAGCTGAAGCTTCAGAGGGGCTCGCATCTCTCTTACACGCCGCCGCCCTACCTGAGGCC  
301 GCCATCCACGCCGGTTGAGTCGCGTTTCTGCCGCTCCCGCCTGTGGTGCCTCCTGAAGTGCCTCCGCCGTCTAGGTAAGTTTAAAGCTCAGGTCGAGACC  
401 GGGCCTTTGTCCGGGCTCCCTTGGAGCCTACCTAGACTCAGCCGGCTCTCCACGCTTTGCTGACCCTGCTTGTCTCAACTCTACGCTTTTGTTCGTTT

**EcoRI (558)** **Eco47III (573)**  
**AgeI (552)** **XhoI (569)**  
**SgrAI (551)** **EcoRV (564)** **NheI (576)** **Bsp120I (587)**  
501 TCTGTTTCTGCGCGGTTACAGATCCAAGCTGTGACCGGGCGCTACCTGAGATCACCGTGAATTCGATATCTCGAGCGCTAGCACCAAGGGCCATCGGTC  
1 A S T K G P S V

**Tth11II (686)**  
601 TTCCCCTGGCGCCTCCTCCAGGAGCACCTCCGAGAGCACAGCGGCCCTGGGCTGCCTGGTCAAGGACTACTTCCCTGAACCCGTGACCGTGCCTGGGA  
9 F P L A P S S R S T S E S T A A L G C L V K D Y F P E P V T V S W

**BstEII (779)** **BstXI (793)**  
701 ACTCAGGCGCCCTGACCAGCGCGTGCACACCTTCCGGCTGTCTACAGTCTCAGGGCTCTACTCCCTCAGCAGCGTGGTACCGTGCCTCCAGCAG  
42 N S G A L T S G V H T F P A V L Q S S G L Y S L S S V V T V P S S S

**PshAI (812)** **BspHI (833)**  
801 CTTGGGCACCCAGACCTACGCTCGCAACGTCGTTTCATGAGCCAGCAACACCAAGGTGGACAAGACAGTCGGGCTCCCATGTCGTTCCACGTGCCACCG  
75 L G T Q T Y V C N V V H E P S N T K V D K T V G L P C R S T C P P

**PvuII (904)** **BspHI (964)**  
901 TGCCAGCTGAACCTCGGGGGACCGTCAGTCTTCTCTTCCCCCAAACCAAGGACACCCTCATGATTTCCCGACCCCTGAGGTCACGTGCGTGG  
109 C P A E L L G G P S V F L F P P K P K D T L M I S R T P E V T C V

1001 TGGTAGACGTGAGCCAGGAAGAACCCGATGCAAGTTCAACTGGTACGTGGACGGCGTGGAGGTGCACAAATGCCAGACGAAGCCACGGGAGGAGCAGTT  
142 V V D V S Q E E P D V K F N W Y V D G V E V H N A Q T K P R E E Q F

1101 CAACAGCAGTACCGCGTGGTACGCGTCTCACCGTCACACACAGGACTGGCTGAACGGCAAGGAGTACACGTGCAAGTCTCAACAAAGCCCTCCCG  
175 N S T Y R V V S V L T V T H Q D W L N G K E Y T C K V S N K A L P

**BsrGI (1255)** **XmaI (1273)**  
1201 GCCCCAAGGCAGAAAAGTCTCCAAAACCAAGGGCAGCCCGAGAGCCACAGGTGTACACCCTGCCCGTCCCGGGAGGAGCTGACCAAGAACCAGG  
209 A P R Q K T V S K T K G Q P R E P Q V Y T L P P S R E E L T K N Q

**Tth11II (1338)**  
1301 TCAGCCTGACCTGCCTGGTCAACGGCTTACCCAGCGACATCGTCTGGAGTGGGCGAGCAACGGGAGCCGGAGAACACCTACAAGACCACGCCGC  
242 V S L T C L V N G F Y P S D I V V E W A S N G Q P E N T Y K T T P P

**XmnI (1472)** **NsiI (1494)**  
1401 CGTGCTGGACTCCGACGGCTCCTACTTCTCTACAGCAAGCTCACCGTGGACAAGAGCAGGTGGCAGCAGGGGAAACGCTCTCTCATGCTCCGTGATGCAT  
275 V L D S D G S Y F L Y S K L T V D K S R W Q Q G N V F S C S V M H

**SapI (1526)** **AvrII (1574)** **MscI (1586)**  
1501 GAGGCTCTGCACAACCACTACACCAGAAGAGCCTCTCCGTGTCTCCGGTAAATGAGTGCACACCCGGCAAGCCTAGTCTAGCTGGCAGACATGAT  
309 E A L H N H Y T Q K S L S V S P G K

1601 AAGATACATTGATGAGTTTGACAAACCACAACCTAGAATGCAGTGAAAAAATGCTTTATTTGTGAAATTTGTGATGCTATTGCTTTATTTGTAACCATT

**HpaI (1718)**  
1701 ATAAGCTGCAATAAACAAGTTAAACAACAACAAATTCATTTCATTTATGTTTCAGGTTCCAGGGGAGGTGTGGGAGGTTTTTAAAGCAAGTAAAACTCT

**AseI (1816)** **XmnI (1814)**  
1801 ACAAATGTGGTATGGAATTAATTCTAAAATACAGCATAGCAAACTTTAACCTCCAAATCAAGCCTCTACTTGAATCCTTTTCTGAGGGATGAATAAGGC

**AlwNI (1908)**  
1901 ATAGGCATCAGGGGCTGTTGCCAATGTGCATTAGCTGTTTGCAGCCTCACCTTCTTTCATGGAGTTTAAAGATATAGTGTATTTTCCCAAGTTTGAACCTA

**SapI (2000)** **SspI (2057)** **SwaI (2071)**  
2001 GCTCTTCATTTCTTTATGTTTTAAATGCACTGACCTCCACATTCCTTTTATAGTAAAAATTCAGAAATAATTTAAATACATCATTGCAATGAAAATAA  
2101 ATGTTTTTATTAGGCAGAAATCCAGATGCTCAAGGCCCTCATAATATCCCCAGTTTAGTAGTTGGACTTAGGGAACAAAGGAACCTTAAATAGAAAT

2201 GGACAGCAAGAAAGCGAGCTTCTAGCTTATCTCAGTCTGCTCTCTGCCACAAAGTGCACGCAGTTGCCGGCCGGGTGCGCAGGGCGAACTCCCGCC  
 125 • D Q E E A V F H V C N G A P D R L A F E R G  
 2301 CCCACGGCTGCTCGCCGATCTCGGTCATGGCCGGCCCGAGGGCTCCCGAAAGTTCGTGGACACGACCTCCGACCACTCGGCGTACAGCTCGTCCAGGCC  
 102 W P Q E G I E T M A P G S A D R F N T S V V E S W E A Y L E D L G  
 SgrAI (2486)  
 2401 GCGCACCCACACCAGGCCAGGGTGTGTCCGGCACCCTGGTCTGGACCGCGTGTGATGAACAGGGTCACGTCGTCGCCGACCACACCGGGCGAAGTCG  
 69 R V W V W A L T N D P V V Q D Q V A S I F L T V D D R V V G A F D  
 XmaI (2513) BsrBI (2549) BssHII (2565)  
 2501 TCCTCCACGAAGTCCCGGAGAACCAGCCGGTGGTCCAGAAGTTCGACCGCTCCGGCGACGTCGCGCGGGTGAGCACCGGAACGGCACTGGTCAACT  
 35 D E V F D R S F G L R D T W F E V A G A V D R A T L V P V A S T L K  
 MseI (2600)  
 2601 TGGCCATGATGGCTCCTCctgtcaggagaggaagagaagaaggttagtacaattgCTATAGTGAGTTGTATTATACTATGCAGATATACTATGCCAATG  
 2 A M  
 AseI (2700) PstI (2719)  
 2701 ATTAATTGTCAAAC TAGGCTGC Agggttcatagtgccacttttctgcactgccccatctctgccccaccctttccaggcatagacagt cagt gactt  
 HindIII (2827) SacII (2842)  
 2801 acCAAACACAGGAGGGAGAAGGCAGAAGCTTGAGACAGACCCGCGGACCGCCGAAGTGCAGGGGACGTGGCTAGGGCGGCTCTTTTATGGTGCC  
 StuI (2927) BspEI (2985)  
 2901 CGGCCCTCGGAGGCAGGGCGCTCGGGGAGGCCTAGCGCCAATCTGCGGTGGCAGGAGCGGGGCCGAAGCCGTGCCTGACCAATCCGGAGCACATAGG  
 SpeI (3092)  
 3001 AGTCTCAGCCCCCGCCCAAAGCAAGGGAAGTCACGC GCCTGTAGCGCCAGCGTGTGTGAAATGGGGGCTTGGGGGGTGGGGCCCTACTAGTCA  
 Bsp120I (3084)  
 3101 AAACAACTCCATTGACGTCAATGGGGTGGAGACTTGAAATCCCGTGAGTCAAACCGCTATCCACGCCATTGATGTACTGCCAAAACCGCATCATC  
 SnaBI (3220)  
 3201 ATGGTAATAGCGATGACTAATACGTAGATGTACTGCCAAGTAGGAAAGTCCCATAAAGGTATGTACTGGGCATAATGCCAGGCGGGCCATTTACCGTCAT  
 NdeI (3325)  
 3301 TGACGTCAATAGGGGGCTACTTGGCATATGATACACTTGATGTACTGCCAAGTGGGCAGTTTACCGTAAATACTCCACCCATTGACGTCAATGGAAAGT  
 3401 CCCTATTGGCGTTACTATGGGAACATACGTCATTATTGACGTCAATGGGCGGGGTCGTTGGGCGTCAAGCCAGGCGGGCCATTTACCGTAAGTTATGTA  
 PacI (3511)  
 3501 ACGCCTGCAGTTAATTAAGAACATGTGAGCAAAGGCCAGCAAAGGCCAGGAACCGTAAAAAGCCGCGTTGCTGGCGTTTTTCCATAGGCTCCGCC  
 PstI (3504) SdaI (3503) BspLU11I (3521)  
 3601 CCCTGACGAGCATCACAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATAAAGATACCAGGCGTTTCCCCCTGGAAGCTCCCTCGTG  
 3701 CGTCTCCTGTTCCGACCTGCCGTTACCGGATACCTGTCCGCTTTCTCCCTTCGGGAAGCGTGGCGCTTTCTCATAGCTCACGCTGTAGGTATCTCA  
 3801 GTTCCGGTGTAGGTCGTTCCGCTCCAAGCTGGGCTGTGTGCACGAACCCCGTTCAGCCGACCGCTGCGCCTTATCCGGTAACTATCGTCTTGAGTCCAA  
 AlwNI (3932)  
 3901 CCCGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCGGTGCTACAGAGTCTTGAAGTGGTGG  
 4001 CCTAACTACGGCTACACTAGAAGAACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGAAAAAGATTGGTAGCTCTTGATCCGGCAAAC  
 4101 AAACCACCGCTGGTAGCGGTGGTTTTTTTGGTTCGCAAGCAGCAGATTACGCGCAGAAAAAAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGGGGTC  
 EagI (4271)  
 4201 TGACGCTCAGTGGAACGAAAACACGTTAAGGGATTTTGGTCATGGCTAGTTAATTAACATTTAAATCAGCGGCCGCAATAAAATATCTTTATTTTCAT  
 PacI (4251) SmaI (4260) NotI (4270)  
 4301 TACATCTGTGTGGTTTTTTTGTGTGAATCGTAACTAACATACGCTCTCCATCAAACAAAACGAAACAAAACAACTAGCAAAATAGGCTGTCCCGAG  
 4401 TGCAAGTGCAGGTGCCAGAACATTTCTCTATCGAA

# Zeocin™

## Selection antibiotic for the *Sh ble* gene; cell culture tested

Catalog code: ant-zn-05, ant-zn-1, ant-zn-5, ant-zn-5b

<http://www.invivogen.com/zeocin>

For research use only

Version 20J14-MM

## PRODUCT INFORMATION

### Contents

Zeocin™ is supplied as a sterile filtered blue solution at 100 mg/ml in HEPES buffer.

- ant-zn-05: 5 x 1 ml (500 mg)
- ant-zn-1: 10 x 1 ml (1 g)
- ant-zn-5: 50 x 1 ml (5 g)
- ant-zn-5b: 1 x 50 ml (5 g)

### Storage and stability

- Zeocin™ is shipped at room temperature. Upon receipt it should be stored at 4 °C or at -20 °C. Avoid repeated freeze-thaw cycles.
- The expiry date is specified on the product label.
- Zeocin™ is sensitive to high concentrations of acids and bases but a short-term exposure to dilute acids can be tolerated.

**Note:** Zeocin™ is stable for 1 month at room temperature.

## QUALITY CONTROL

Each lot is thoroughly tested to ensure the absence of lot-to-lot variation.

- Endotoxin level: < 1 EU/mg
- Physicochemical characterization (including HPLC, pH, appearance)
- Cell culture tested: potency validated in Zeocin™-sensitive and Zeocin™-resistant mammalian cell lines
- Non-cytotoxicity of trace contaminants: absence of long-term effects confirmed in Zeocin™-resistant cells

## BACKGROUND

Zeocin™ is a selection antibiotic that acts on both eukaryotic and prokaryotic cells. Resistance to Zeocin™ is conferred by the *Sh ble* gene from *Streptoalloteichus hindustanus*<sup>1-3</sup>.

Zeocin™ is the commercial name for a special formulation containing Phleomycin, a copper-chelated glycopeptide antibiotic isolated from a mutant strain of *Streptomyces verticillus*. This antibiotic of the bleomycin family exhibits activity against bacteria, eukaryotic microorganisms, plant and animal cells. Although bleomycin antibiotics perturb plasma membranes, their activity is generally believed to be related to their ability to bind and intercalate DNA thus destroying the integrity of the double helix.

## GENERAL GUIDELINES

Successful transfection is influenced by many factors. The health and viability of the cell line, the quality of the nucleic acid used, the transfection reagent, the duration of transfection, and the presence or absence of serum can all play a part.

## SAFETY CONSIDERATIONS

Zeocin™ is a harmful compound. Refer to safety data sheet for handling instructions.

## CHEMICAL PROPERTIES

Zeocin™ is a mixture of structurally related antibiotics which differ by their terminal amine residues. The antibiotics are in a copper chelated form giving the solution a blue color. Zeocin™ is a labile compound which undergoes irreversible denaturation at high and low pH or in presence of a weak oxidant.

## CONDITIONS OF SELECTION

Most cells growing aerobically are killed by 0.5 to 1000 µg/ml Zeocin™. However, the sensitivity of cells is pH dependent, i.e. the higher the pH of culture medium, the greater the sensitivity. Thus the concentration of Zeocin™ required for complete growth inhibition of given cells can be reduced by increasing the pH of the medium. In addition, the activity of Zeocin™ is reduced by a factor of 2 to 3 in hypertonic media, such as those used for protoplast regeneration. Hence, using low salt medium when possible decreases the amount of Zeocin™ needed.

### - *Escherichia coli*

The *Sh ble* gene and the hybrid genes in vectors provided by InvivoGen are driven by synthetic *E. coli* promoters (i.e. EM7). The cells of the common *E. coli* recipient strains (i.e. HB101, DH5α, MC1061) transformed by these vectors are resistant to Zeocin™.

**Note:** Do not use an *E. coli* recipient strain that contains the *Tn5* transposable element (i.e. MC1066). *Tn5* encodes a bleomycin-resistance gene that will confer resistance to Zeocin™.

Zeocin-resistant transformants are selected in Low Salt LB agar medium (yeast extract 5 g/L, Tryptone 10 g/L, NaCl 5 g/L, Agar 15 g/L, pH 7.5) supplemented with 25 µg/ml of Zeocin™. Plates containing Zeocin™ are stable for 1 month when stored at 4 °C.

### - Mammalian cells

The working concentration of Zeocin™ for mammalian cell lines varies from 50 to 400 µg/ml, in a few cases can be as low as 20 µg/ml or as high as 1000 µg/ml. In a starting experiment we recommend to determine the optimal concentration of Zeocin™ required to kill your host cell line. The killing and the detachment of dead cells from the plate, especially at high cell density, may require a longer time compared to G418. Foci of Zeocin-resistant stable transfectants are usually individualized after 5 days to 3 weeks incubation, depending on the cell line. Suggested concentrations of Zeocin™ for selection in mammalian cells are listed on the next page.

## TECHNICAL SUPPORT

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## WORKING CONCENTRATIONS

Zeocin™ is normally used at a concentration of 100 µg/ml, a 1000-fold dilution from the stock solution. However, the optimal concentration needs to be determined for your cells. Suggested concentrations of Zeocin™ for selection in some examples of mammalian cells are listed below.

Cell line	Medium	Zeocin™ conc	References
B16 (Mouse melanocytes)	RPMI	20-250 µg/ml	4-6
CHO (Chinese hamster ovarian cells)	DMEM	100-500 µg/ml	4, 7, 8
COS (Monkey kidney cells)	DMEM	100-400 µg/ml	9, 10
HEK293 (Human embryonic kidney cells)	DMEM	100-400 µg/ml	11, 12
HeLa (Human uterine cells)	DMEM	50-100 µg/ml	13, 14
J558L (Mouse melanocytes)	RPMI	400 µg/ml	15
MCF-7 (Human breast adenocarcinoma cells)	DMEM	100-400 µg/ml	16, 17
MEFs (Mouse embryonic fibroblasts)	DMEM	200-400 µg/ml	18, 19
THP-1 (Human monocytes)	RPMI	200 µg/ml	20

## REFERENCES

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