pVITRO1-blasti-GFP/SEAP

An expression plasmid coding for the GFP and SEAP reporter genes

Catalog code: pvitro1-bgfpsp

https://www.invivogen.com/pvitro1-gfpseap

For research use only

Version 20F23-MM

PRODUCT INFORMATION

Contents:

- 20 µg of pVITRO1-blasti-GFP/SEAP provided as lyophilized DNA
- 2 x 1 ml blasticidin at 10 mg/ml

Storage and stability

- Product is shipped at room temperature.
- Upon receipt, store lyophilized DNA at -20°C.
- Resuspended DNA should be stored at -20°C.
- Store blasticidin at 4°C or -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 and lyophilized.

GENERAL PRODUCT USE

pVITRO is a family of vectors that allow the co-expression of two or more genes from two different transcription units. pVITRO plasmids can be stably transfected in mammalian cells and are expressed at high levels.

pVITRO1-GFP/SEAP contains the reporter genes GFP and SEAP and can be used as a control vector. pVITRO1-GFP/SEAP also can be used for cloning of open reading frames (ORF). Both reporter genes are flanked by unique sites (NcoI/AvrII for GFP and BspHI/NheI for SEAP) that allow for convenient cloning of ORFs.

PLASMID FEATURES

- **rEF1 and mEF1 prom:** pVITRO1-blasti-GFP/SEAP plasmid carries two elongation factor 1 alpha (EF-1α) promoters, from rat and mouse origins. Similarly to their human counterpart[1], both promoters display a strong activity that yield similar levels of expression. EF-1α promoters are expressed at high levels in all cell cycles and lower levels during G0 phase. EF-1α promoters are also non-tissue specific; they are highly expressed in all cell types.
- **SV40 enhancer** which is comprised of a 72-base-pair repeat allows the enhancement of gene expression in a large host range. The enhancement varies from 2-fold in non-permissive cells to 20-fold in permissive cells. Furthermore, the SV40 enhancer is able to direct nuclear localization of plasmids[2].
- **CMV enhancer:** The major immediate early enhancer of the human cytomegalovirus (HCMV) is composed of unique and repeated sequence motifs. The HCMV enhancer can substitute for the 72-bp repeats of SV40 and is several-fold more active than the SV40 enhancer[3].
- **SV40 pAn:** The Simian Virus 40 late polyadenylation signal enables efficient cleavage and polyadenylation reactions resulting in high levels of steady-state mRNA. The efficiency of this signal was first described by Carswell et al.[4]
- **pMB1 Ori** is a minimal *E. coli* origin of replication to limit vector size, but with the same activity as the longer Ori.
- **FMDV IRES:** The internal ribosome entry site of the Foot and Mouth Disease Virus enables the translation of two open reading frames from one mRNA with high levels of expression[5].
- **EM7** is a bacterial promoter that enables the constitutive expression of the antibiotic resistance gene in *E. coli*.
- ***Bsr* gene** confers resistance to Blasticidin both in *E. coli* and mammalian cells. In bacteria, *bsr* is expressed from the constitutive *E. coli* EM7 promoter. In mammalian cells, bsr is transcribed from the rat EF-1α promoter as a polycistronic mRNA and translated via the FMDV IRES.
- **EF1 pAn** is a strong polyadenylation signal. InvivoGen uses a sequence starting after the stop codon of the EF1 cDNA and finishing after a bent structure rich in GT.
- **GFP gene:** This red-shifted variant of the jellyfish GFP gene encodes a green fluorescent protein that absorbs blue light (major peak at 480 nm) and emits green light (major peak at 505 nm).
- **SEAP** is a secreted form of human embryonic alkaline phosphatase. Unlike endogenous alkaline phosphatases, SEAP is extremely heat stable and resistant to the inhibitor L-homoarginine. It catalyses the hydrolysis of pNitrophenyl phosphate (pNpp) producing a yellow end product. SEAP expression can be readily quantified by collecting samples of culture medium and measuring the hydrolysis of pNpp with a spectrophometer at 405 nm. SEAP activity that can be readily assessed qualitatively and quantitatively using HEK-Blue™ Detection or QUANTI-Blue™.

1. Kim DW. *et al.*, 1990. Use of the human elongation factor 1α promoter as a versatile and efficient expression system Gene 91(2):217-23. 2. Dean DA. *et al.*, 1999. Sequence requirements for plasmid nuclear import. Exp. Cell. Res. 253:713-22. 3. Boshart M. *et al.*, 1985. A very strong enhancer is located upstream of an immediate early gene of human cytomegalovirus. Cell 41(2):521-30. 4. 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. 5. Ramesh N. *et al.*, 1996. High-riter bicistronic retroviral vectors employing foot-and-mouth disease virus internal ribosome entry site. Nucleic Acids Res. 24(14):2697-700.

METHODS

Plasmid resuspension:

Quickly spin the tube containing the lyophilized plasmid to pellet the DNA. To obtain a plasmid solution at 1 µg/µl, resuspend the DNA in 20 µl of sterile water. Store resuspended plasmid at -20°C.

Plasmid amplification and cloning:

Plasmid amplification and cloning can be performed in *E. coli* GT116 or other commonly used laboratory *E. coli* strains, such as DH5α.

Blasticidin usage

Blasticidin should be used at 25-100 µg/ml in bacteria and 1-30 µg/ml in mammalian cells. Blasticidin is supplied at 10 mg/ml in HEPES buffer.

TECHNICAL SUPPORT
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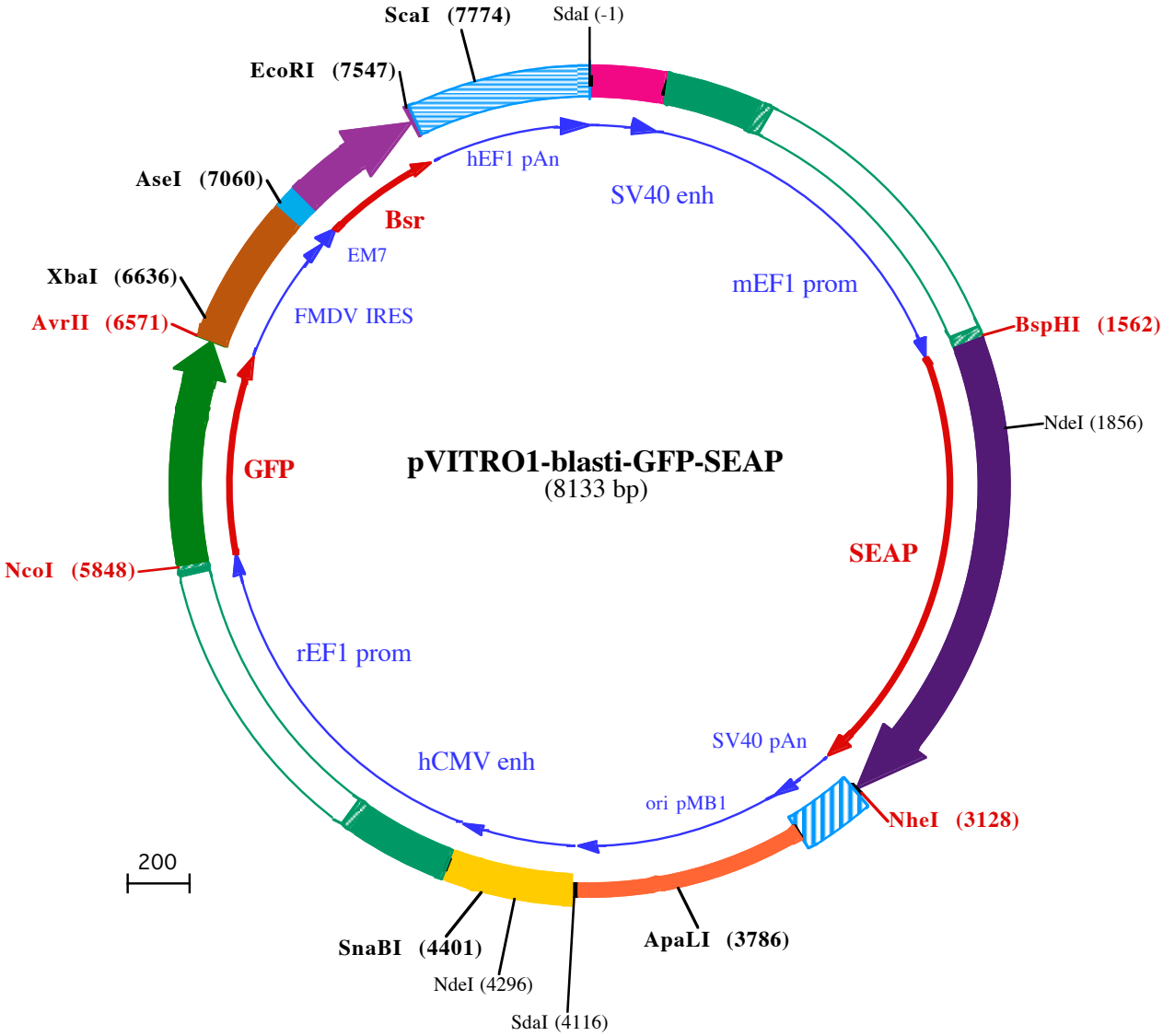
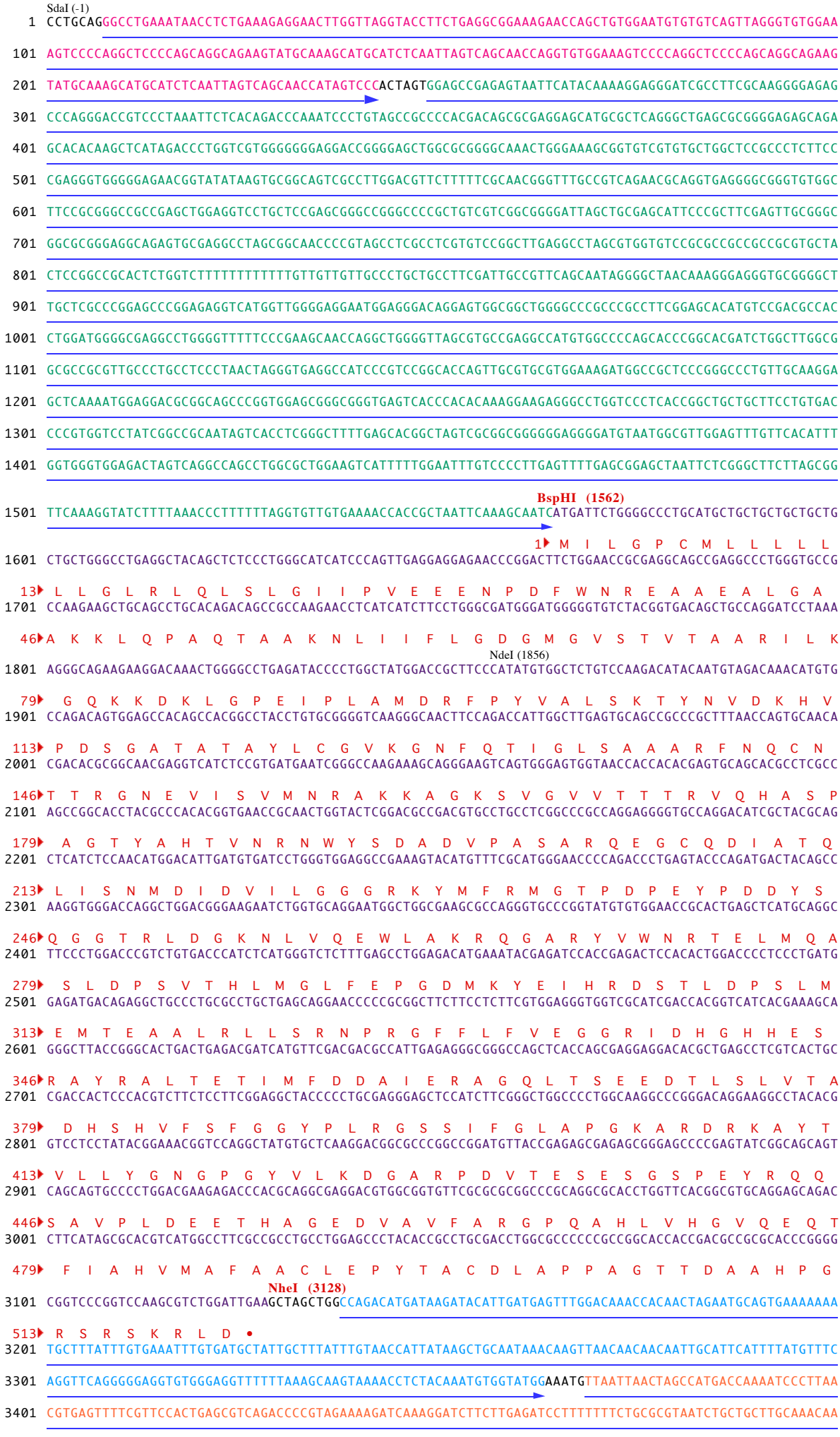
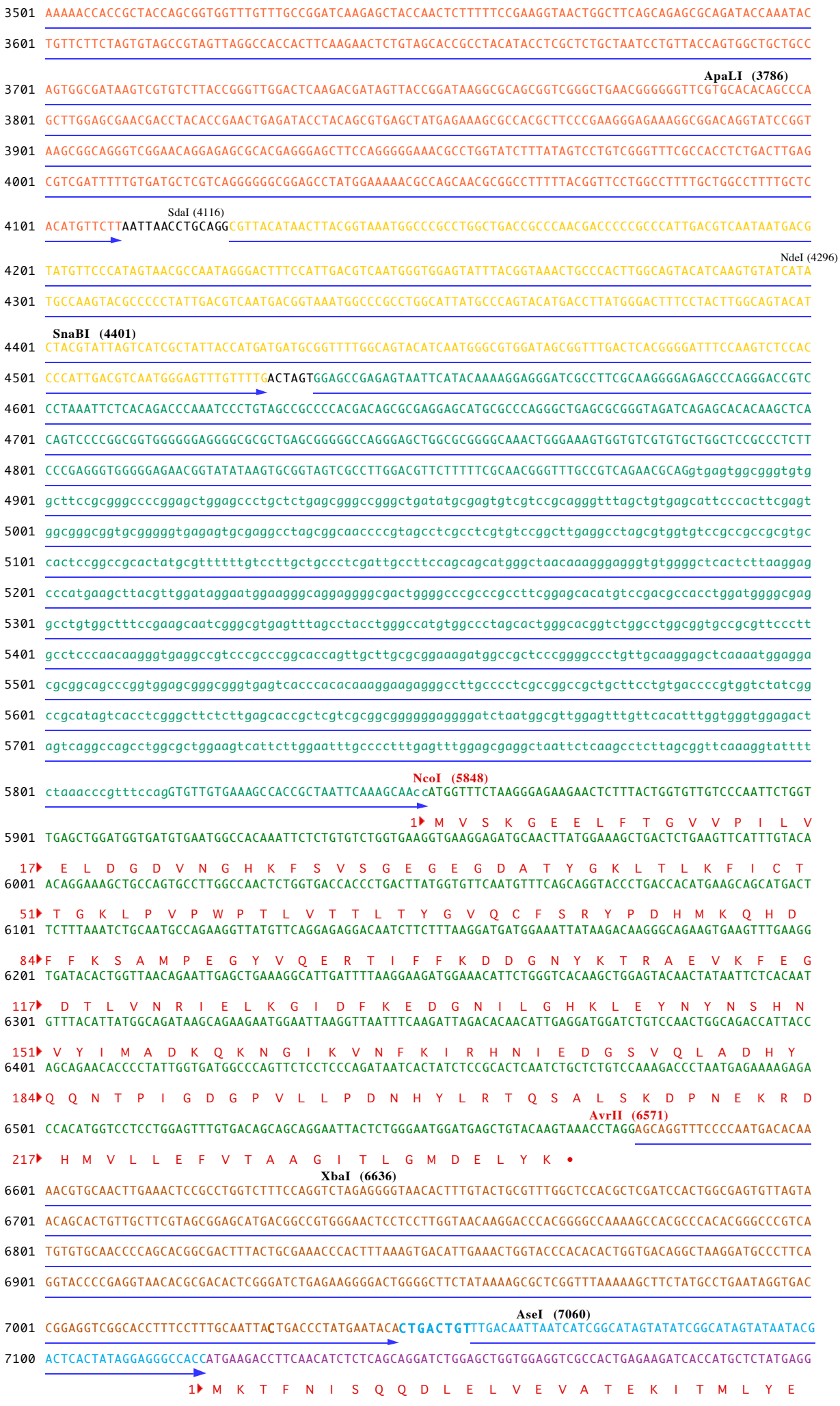

ScaI (7774)
SdaI (-1)
EcoRI (7547)
AseI (7060)
Bsr
EM7
hEF1 pAn
SV40 enh
mEF1 prom
XbaI (6636)
AvrII (6571)
FMDV IRES
BspHI (1562)
NdeI (1856)
GFP
pVITRO1-blasti-GFP-SEAP
(8133 bp)
SEAP
NcoI (5848)
rEF1 prom
SV40 pAn
hCMV enh
ori pMB1
NheI (3128)
200
SnaBI (4401)
NdeI (4296)
SdaI (4116)
ApaLI (3786)


SdaI (-1)
BspHI (1562)
NdeI (1856)
NheI (3128)


ApaLI (3786)
SdaI (4116)
NdeI (4296)
SnaBI (4401)
NcoI (5848)
AvrII (6571)
XbaI (6636)
AseI (7060)


7200 ACAACAAGCACCATGTCGGGGCGGCCATCAGGACCAAGACTGGGGAGATCATCTCTGCTGTCCACATTGAGGCCTACATTGGCAGGGTCACTGTCTGTGC
27 D N K H H V G A A I R T K T G E I I S A V H I E A Y I G R V T V C A
7300 TGAAGCCATTGCCATTGGGTCTGCTGTGAGCAACGGGCAGAAGGACTTTGACACCATTGTGGCTGTCAGGCACCCCTACTCTGATGAGGTGGACAGATCC
60 E A I A I G S A V S N G Q K D F D T I V A V R H P Y S D E V D R S
7400 ATCAGGGTGGTCAGCCCCTGTGGCATGTGCAGAGAGCTCATCTCTGACTATGCTCCTGACTGCTTTGTGCTCATTGAGATGAATGGCAAGCTGGTCAAAA
94 I R V V S P C G M C R E L I S D Y A P D C F V L I E M N G K L V K
EcoRI (7547)
7500 CCACCATTGAGGAACTCATCCCCCTCAAGTACACCAGGAACTAAACCTGAATTCGCTAGGATTATCCCTAATACCTGCCACCCCACTCTTAATCAGTGGT
127 T T I E E L I P L K Y T R N •
7600 GGAAGAACGGTCTCAGAACTGTTTGTTTCAATTGGCCATTTAAGTTTAGTAGTAAAAGACTGGTTAATGATAACAATGCATCGTAAAACCTTCAGAAGGA
ScaI (7774)
7700 AAGGAGAATGTTTTGTGGACCACTTTGGTTTTCTTTTTTGCGTGTGGCAGTTTTAAGTTATTAGTTTTTAAAATCAGTACTTTTTAATGGAAACAACTTG
7800 ACCAAAAATTTGTCACAGAATTTTGAGACCCATTAAAAAAGTTAAATGAGAAACCTGTGTGTTCCTTTGGTCAACACCGAGACATTTAGGTGAAAGACAT
7900 CTAATTCTGGTTTTACGAATCTGGAAACTTCTTGAAAATGTAATTCTTGAGTTAACACTTCTGGGTGGAGAATAGGGTTGTTTTCCCCCCACATAATTGG
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8100 CAAAAACTGAGTCCTTGGGTTGCATAGAAAGCTG