pRL-SV40 Vector

Promega

Technical Bulletin No. 239

INSTRUCTIONS FOR USE OF PRODUCT E2231. *PLEASE DISCARD PREVIOUS VERSIONS.*
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I. Description

The pRL-SV40 Vector[a,b] (Figure 1) is intended for use as an internal control reporter and may be used in combination with any experimental reporter vector to cotransfect mammalian cells. All of Promega's pRL Reporter Vectors contain a cDNA (R*luc*) encoding *Renilla* luciferase, which was originally cloned from the marine organism *Renilla reniformis* (sea pansy; 1). As described below, the *Renilla* luciferase cDNA[b] contained within the pRL Vectors has been modified slightly to provide greater utility.

The pRL-SV40 Vector contains the SV40 enhancer and early promoter elements to provide high-level expression of *Renilla* luciferase in cotransfected mammalian cells. *Renilla* luciferase is a 36kDa monomeric protein that does not require post-translational modification for activity (2). Therefore, like firefly luciferase, the enzyme may function as a genetic reporter immediately following translation. For information about the use of this plasmid in conjunction with a reporter vector containing the firefly luciferase gene, refer to the *Dual-Luciferase® Reporter Assay System*[c,d] *Technical Manual* (#TM040).

The pRL Vectors are isolated from a *dam*$^-$/*dcm*$^-$ *E. coli* K host strain, allowing digestion with restriction enzymes that are sensitive to dam and dcm methylation.

The GenBank®/EMBL Accession Number for the pRL-SV40 Vector is AF025845.

II. Product Components

Product	Size	Cat.#
pRL-SV40 Vector	20µg	E2231

All pRL Vectors are supplied in TE buffer (pH 7.4) and are provided with a glycerol stock of bacterial strain JM109. The JM109 cells do not contain vector and are not competent cells.

Storage Conditions: Store vector DNA at –20°C and the glycerol stock of JM109 cells at –70°C.

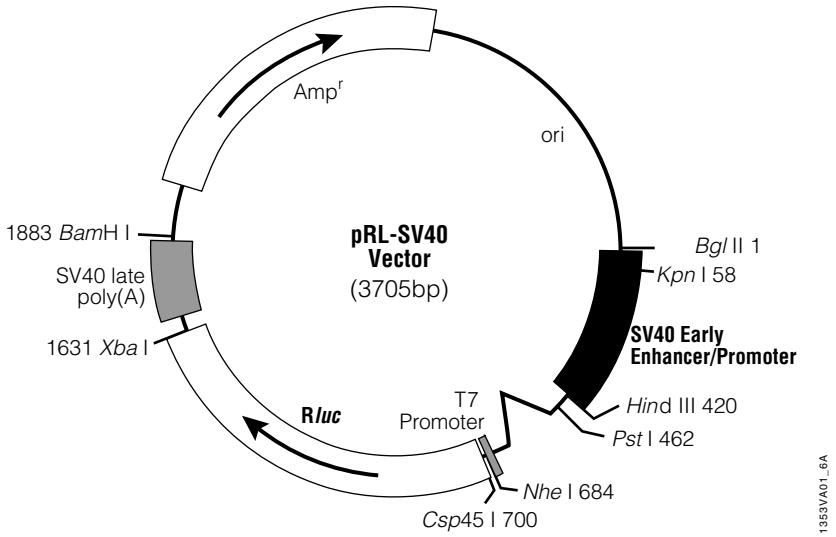

Figure 1. The pRL-SV40 Vector circle map and sequence reference points.

Sequence reference points:

SV40 enhancer and early promoter	7–418
chimeric intron	486–622
T7 RNA polymerase promoter (–17 to +2)	666–684
T7 RNA polymerase transcription initiation site	683
R*luc* reporter gene	694–1629
SV40 late polyadenylation signal	1671–1872
β-lactamase (Amp^r) coding region	2019–2879

In addition:

- –^– indicates the position of the intron.
- R*luc* is the cDNA encoding the *Renilla* luciferase enzyme.
- Amp^r indicates the gene encoding ampicillin resistance in *E. coli.*
- ori is the origin of replication in *E. coli.*
- The arrows within the R*luc* and Amp^r genes indicate the direction of transcription.

III. Features of the pRL-SV40 Vector

A. SV40 Enhancer/Promoter Regions

The pRL-SV40 Vector contains the SV40 enhancer/promoter region, which provides strong, constitutive expression of R*luc* in a variety of cell types. The vectors also contains the SV40 origin of replication, which allows transient, episomal replication in cells expressing the SV40 large T antigen, such as COS-1 or COS-7 cells (3).

B. Chimeric Intron

Downstream of the SV40 enhancer/promoter region of the pRL-SV40 Vector is a chimeric intron comprised of the 5´-donor splice site from the first intron of the human β-globin gene, and the branch and 3´-acceptor splice site from an intron preceding an immunoglobulin gene heavy chain variable region (4). The sequences of the donor and acceptor splice sites, along with the branchpoint site, have been modified to match the consensus sequences for optimal splicing (5).

Transfection studies have demonstrated that the presence of an intron flanking a cDNA insert frequently increases the level of gene expression (6–9). In the pRL-SV40 Vector, the intron is positioned 5´ to R*luc* to minimize the utilization of cryptic 5´-donor splice sites that may reside within the reporter gene sequence (10).

C. T7 Promoter

A T7 promoter is located downstream of the chimeric intron, immediately preceding the R*luc* reporter gene. This T7 promoter can be used to synthesize RNA transcripts in vitro using T7 RNA Polymerase (Cat.# P2075). T7 RNA Polymerase can also be used to synthesize active *Renilla* luciferase in a cell-free coupled eukaryotic in vitro transcription/translation reaction (e.g., Promega's TNT® Reticulocyte Lysate[c,e,f,g] [Cat.# L4610], Wheat Germ Extract[c,e,f,g] [Cat.# L4140] or TNT® T7 Quick Coupled Transcription/Translation[c,e,f,g,h] [Cat.# L1170] Systems).

Due to sequence differences between the T7 Promoter Primer offered by Promega (Cat.# Q5021) and the T7 promoter used in the pRL family of *Renilla* luciferase co-reporter vectors, this primer cannot be used for sequencing with this vector.

D. *Renilla* Luciferase Reporter Gene (R*luc*)

The *Renilla* luciferase cDNA inserted into all of the pRL Vectors is derived from the anthozoan coelenterate *Renilla reniformis* (1) but contains nucleotide changes that were engineered during the construction of the individual vectors. The following bases were altered in the pRL-SV40 Vector: base 924 (T→C) to eliminate an internal *Bam*H I site; base 1500 (C→T) to eliminate internal *Nar* I, *Kas* K, *Ban* K and *Acy* I sites. These nucleotide substitutions do not alter the amino acid sequence of the encoded *Renilla* luciferase reporter enzyme.

E. SV40 Late Polyadenylation Signal

Polyadenylation signals cause the termination of transcription by RNA polymerase II and signal the addition of approximately 200–250 adenosine residues to the 3´-end of the RNA transcript (11). Polyadenylation has been shown to enhance RNA stability and translation (12,13). The late SV40 polyadenylation signal, which is extremely efficient and has been shown to increase the steady-state level of RNA approximately five-fold more than the early SV40 polyadenylation signal (14), has been positioned 3´ to the R*luc* gene in the pRL-SV40 Vector to increase the level of *Renilla* luciferase expression.

IV. Transfection of Mammalian Cells with pRL-SV40

The pRL-SV40 Vector may be used in combination with any experimental reporter vector to cotransfect mammalian cells. However, it is important to realize that *trans* effects between promoters on cotransfected plasmids can potentially affect reporter gene expression (15). This is primarily of concern when either the control or experimental reporter vector, or both, contain very strong promoter/enhancer elements. The occurrence and magnitude of such effects will depend on several factors: i) the combination and activities of the genetic regulatory elements present on the cotransfected vectors, ii) the relative ratio of experimental vector to control vector introduced into the cells, and iii) the cell type transfected.

To help ensure independent genetic expression between experimental and control reporter genes, preliminary cotransfection experiments should be performed to optimize both the amount of vector DNA and the ratio of the coreporter vectors added to the transfection mixture. Similar to the firefly luciferase assay, the *Renilla* luciferase assay is extremely sensitive, providing accurate measurement of ≥10 femtograms of *Renilla* luciferase, with linearity over 7 orders of enzyme concentration. Therefore, it is possible to use relatively small quantities of pRL-SV40 Vector to provide low-level, constitutive coexpression of *Renilla* luciferase control activity. Ratios of 10:1 to 50:1 (or greater) for experimental vector:pRL-SV40 Vector combinations are feasible and may aid greatly in suppressing the occurrence of *trans* effects between promoter elements.

The pRL-SV40 Vector can be used for both transient and stable expression of genes. For stable expression, the pRL-SV40 Vector must be cotransfected with an expression vector containing a selectable gene in mammalian cells. Transfection of DNA into mammalian cells may be mediated by cationic lipids (16,17), calcium phosphate (18,19), DEAE-Dextran (20–22), polybrene-DMSO (23,24) or electroporation (25,26).

Transfection systems based on cationic lipid compounds (TransFast™ Reagent[i], Tfx™ Reagents[j] and Transfectam® Reagent[k]), calcium phosphate and DEAE-Dextran are available from Promega. For more information and a protocol for the Transfectam® Reagent, please request the *Transfectam® Reagent Technical Bulletin* (#TB116) and for the TransFast™ Reagent, please request the *TransFast™ Transfection Reagent Technical Bulletin* (#TB260). Protocols for the use of the Tfx™ Reagents can be found in the *Tfx™-10, Tfx™-20 and Tfx™-50 Reagent Technical Bulletin* (#TB216). For transfection procedures using calcium phosphate or DEAE-Dextran, please request the *ProFection® Mammalian Transfection Systems Technical Manual* (#TM012).

V. pRL-SV40 Vector Restriction Sites and Sequence

A. pRL-SV40 Vector Restriction Sites

The following restriction enzyme tables were constructed using DNASTAR® sequence analysis software. Please note that we have not verified this information by restriction digestion with each enzyme listed. The location given specifies the 3´ end of the cut DNA (the base to the left of the cut site). For more information on the cut sites of these enzymes, or if you identify a discrepancy, please contact your local Promega Branch Office or Distributor. In the U.S., contact Promega Technical Services at 800-356-9526.

Table 1. Restriction Enzymes That Cut the pRL-SV40 Vector Between 1 and 5 Times.

Enzyme	# of Sites	Location
***Acc*65 I**	1	54
***Acy* I**	1	2266
Afl II	2	452, 649
Afl III	1	876
***Alw*26 I**	5	449, 514, 539, 1964, 2740
***Alw*44 I**	2	2134, 3380
*Alw*N I	1	3285
*Asp*H I	3	2138, 2223, 3384
***Ava* II**	4	742, 1464, 2442 2664
Avr II	1	404
***Bam*H I**	1	1883
***Ban* I**	4	54, 575, 1498 2853
Bbs I	2	560, 1534
***Bbu* I**	2	152, 224
***Bcl* I**	2	978, 1187
***Bgl* I**	2	357, 2688
***Bgl* II**	1	1
Bsa I	2	514, 2740
***Bsa*O I**	4	1641, 2288, 2437, 3360
*Bsa*A I	1	1426
*Bsa*B I	1	1882
*Bsa*H I	1	2266
***Bsa*M I**	2	1702, 1795
Bsm I	2	1702, 1795
***Bsp*1286 I**	3	2138, 2223, 3384
*Bsp*H I	3	1262, 1966, 2974
*Bsp*M I	1	476
***Bsr*BR I**	1	1882
*Bsr*G I	1	1392
*Bss*S I	3	1352, 2137, 3521
***Bst*98 I**	2	452, 649
***Bst*Z I**	1	1638
*Cfr*10 I	1	2721
***Cla* I**	1	1876
***Csp*45 I**	1	700
***Dra* I**	4	1842, 2228, 2920, 2939
Drd I	2	441, 3592
Dsa I	2	15, 311
Eae I	3	1044, 1638, 2413

Enzyme	# of Sites	Location
Eag I	1	1638
Ear I	2	864, 2007
***Ecl*HK I**	1	2806
***Eco*52 I**	1	1638
Fsp I	2	8, 2583
***Hae* II**	1	3454
Hga I	3	2274, 3004, 3582
***Hinc* II**	1	1781
*Hin*d II	1	1781
***Hin*d III**	1	420
***Hpa* I**	1	1781
***Hsp*92 I**	1	2266
***Kpn* I**	1	58
Mae II	5	1388, 1425, 2204, 2577, 2993
***Msp*A1 I**	4	80, 2170, 3111, 3356
***Nci* I**	3	2270, 2621, 3317
***Nco* I**	2	15, 311
***Nhe* I**	1	684
***Not* I**	1	1638
***Nsi* I**	2	154, 226
Nsp I	4	152, 224, 820, 880
*Pae*R7 I	2	542, 3700
Ple I	4	550, 666, 2815, 3318
*Ppu*10 I	2	150, 222
***Pst* I**	1	462
***Pvu* I**	1	2437
***Pvu* II**	1	80
***Rsa* I**	4	56, 662, 1394, 2325
***Sca* I**	2	662, 2325
***Sfi* I**	1	357
***Sin* I**	4	742, 1464, 2442, 2664
***Sph* I**	2	152, 224
***Ssp* I**	1	2001
***Stu* I**	1	403
***Sty* I**	3	15, 311, 404
***Vsp* I**	2	794, 2631
***Xba* I**	1	1631
Xcm I	1	1343
***Xmn* I**	2	1228, 2206

Note: The enzymes listed in boldface type are available from Promega.

Table 2. Restriction Enzymes That Do Not Cut the pRL-SV40 Vector.

***Aat* II**	*Bbr*P I	*Dra* III	*Kas* I	*Pml* I	***Sma* I**
***Acc* B7 I**	*Blp* I	***Eco*47 III**	***Mlu* I**	*Ppu*M I	***Sna*B I**
***Acc* I**	*Bpu* 1102 I	*Eco*72 I	***Nae* I**	*Psh*A I	***Spe* I**
***Acc* III**	*Bsp*120 I	*Eco*81 I	***Nar* I**	*Psp*5 II	*Spl* I
***Age* I**	***Bss*H II**	***Eco*ICR I**	***Nde* I**	*Psp*A I	*Srf* I
***Apa* I**	*Bst*1107 I	*Eco*N I	***Ngo*M IV**	*Rsr* II	*Sse*8387 I
Asc I	***Bst*E II**	***Eco*R I**	***Nru* I**	***Sac* I**	*Swa* I
***Ava* I**	***Bst*X I**	***Eco*R V**	*Pac* I	***Sac* II**	***Tth*111 I**
***Bal* I**	***Bsu*36 I**	*Ehe* I	*Pfl*M I	***Sal* I**	***Xho* I**
***Ban* II**	***Csp* I**	*Fse* I	*Pin*A I	***Sgf* I**(I)	***Xma* I**
Bbe I	*Dra* II	**I-*Ppo* I**	*Pme* I	*Sgr*A I	

Table 3. Restriction Enzymes That Cut the pRL-SV40 Vector 6 or More Times.

Aci I	***Bst*O I**	***Fok* I**	*Mae* I	***Nde* II**	***Taq* I**
***Alu* I**	*Bst*U I	***Hae* III**	*Mae* III	*Nla* III	*Tfi* I
Bbv I	***Cfo* I**	***Hha* I**	***Mbo* I**	*Nla* IV	***Tru*9 I**
*Bsa*J I	***Dde* I**	***Hin*f I**	***Mbo* II**	***Sau*3A I**	***Xho* II**
Bsr I	***Dpn* I**	***Hpa* II**	*Mnl* I	***Sau*96 I**	
***Bsr* S I**	*Dpn* II	*Hph* I	*Mse* I	*Scr*F I	
***Bst*71 I**	*Fnu*4H I	***Hsp*92 II**	***Msp* I**	*Sfa*N I	

Note: The enzymes listed in boldface type are available from Promega.

B. pRL-SV40 Vector Sequence

The sequence shown corresponds to the mRNA synthesized from the *Renilla* luciferase gene from the SV40 promoter. The vector sequence is also available on the Internet at www.promega.com/vectors. The GenBank®/EMBL Accession number for the pRL-SV40 Vector is AF025845.

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  1  AGATCTGCGC AGCACCATGG CCTGAAATAA CCTCTGAAAG AGGAACTTGG
 51  TTAGGTACCT TCTGAGGCGG AAAGAACCAG CTGTGGAATG TGTGTCAGTT
101  AGGGTGTGGA AAGTCCCCAG GCTCCCCAGC AGGCAGAAGT ATGCAAAGCA
151  TGCATCTCAA TTAGTCAGCA ACCAGGTGTG GAAAGTCCCC AGGCTCCCCA
201  GCAGGCAGAA GTATGCAAAG CATGCATCTC AATTAGTCAG CAACCATAGT
251  CCCGCCCCTA ACTCCGCCCA TCCCGCCCCT AACTCCGCCC AGTTCCGCCC
301  ATTCTCCGCC CCATGGCTGA CTAATTTTTT TTATTTATGC AGAGGCCGAG
351  GCCGCCTCGG CCTCTGAGCT ATTCCAGAAG TAGTGAGGAG GCTTTTTTGG
401  AGGCCTAGGC TTTTGCAAAA AGCTTGATTC TTCTGACACA ACAGTCTCGA
451  ACTTAAGCTG CAGAAGTTGG TCGTGAGGCA CTGGGCAGGT AAGTATCAAG
501  GTTACAAGAC AGGTTTAAGG AGACCAATAG AAACTGGGCT TGTCGAGACA
551  GAGAAGACTC TTGCGTTTCT GATAGGCACC TATTGGTCTT ACTGACATCC
601  ACTTTGCCTT TCTCTCCACA GGTGTCCACT CCCAGTTCAA TTACAGCTCT
651  TAAGGCTAGA GTACTTAATA CGACTCACTA TAGGCTAGCC ACCATGACTT
701  CGAAAGTTTA TGATCCAGAA CAAAGGAAAC GGATGATAAC TGGTCCGCAG
751  TGGTGGGCCA GATGTAAACA AATGAATGTT CTTGATTCAT TTATTAATTA
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B. Sequence of the pRL-SV40 Vector (continued)

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 801  TTATGATTCA GAAAAACATG CAGAAAATGC TGTTATTTTT TTACATGGTA
 851  ACGCGGCCTC TTCTTATTTA TGGCGACATG TTGTGCCACA TATTGAGCCA
 901  GTAGCGCGGT GTATTATACC AGACCTTATT GGTATGGGCA AATCAGGCAA
 951  ATCTGGTAAT GGTTCTTATA GGTTACTTGA TCATTACAAA TATCTTACTG
1001  CATGGTTTGA ACTTCTTAAT TTACCAAAGA AGATCATTTT TGTCGGCCAT
1051  GATTGGGGTG CTTGTTTGGC ATTTCATTAT AGCTATGAGC ATCAAGATAA
1101  GATCAAAGCA ATAGTTCACG CTGAAAGTGT AGTAGATGTG ATTGAATCAT
1151  GGGATGAATG GCCTGATATT GAAGAAGATA TTGCGTTGAT CAAATCTGAA
1201  GAAGGAGAAA AAATGGTTTT GGAGAATAAC TTCTTCGTGG AAACCATGTT
1251  GCCATCAAAA ATCATGAGAA AGTTAGAACC AGAAGAATTT GCAGCATATC
1301  TTGAACCATT CAAAGAGAAA GGTGAAGTTC GTCGTCCAAC ATTATCATGG
1351  CCTCGTGAAA TCCCGTTAGT AAAAGGTGGT AAACCTGACG TTGTACAAAT
1401  TGTTAGGAAT TATAATGCTT ATCTACGTGC AAGTGATGAT TTACCAAAAA
1451  TGTTTATTGA ATCGGACCCA GGATTCTTTT CCAATGCTAT TGTTGAAGGT
1501  GCCAAGAAGT TTCCTAATAC TGAATTTGTC AAAGTAAAAG GTCTTCATTT
1551  TTCGCAAGAA GATGCACCTG ATGAAATGGG AAAATATATC AAATCGTTCG
1601  TTGAGCGAGT TCTCAAAAAT GAACAATAAT TCTAGAGCGG CCGCTTCGAG
1651  CAGACATGAT AAGATACATT GATGAGTTTG GACAAACCAC AACTAGAATG
1701  CAGTGAAAAA AATGCTTTAT TTGTGAAATT TGTGATGCTA TTGCTTTATT
1751  TGTAACCATT ATAAGCTGCA ATAAACAAGT TAACAACAAC AATTGCATTC
1801  ATTTTATGTT TCAGGTTCAG GGGGAGGTGT GGGAGGTTTT TTAAAGCAAG
1851  TAAAACCTCT ACAAATGTGG TAAAATCGAT AAGGATCCAG GTGGCACTTT
1901  TCGGGGAAAT GTGCGCGGAA CCCCTATTTG TTTATTTTTC TAAATACATT
1951  CAAATATGTA TCCGCTCATG AGACAATAAC CCTGATAAAT GCTTCAATAA
2001  TATTGAAAAA GGAAGAGTAT GAGTATTCAA CATTTCCGTG TCGCCCTTAT
2051  TCCCTTTTTT GCGGCATTTT GCCTTCCTGT TTTTGCTCAC CCAGAAACGC
2101  TGGTGAAAGT AAAAGATGCT GAAGATCAGT TGGGTGCACG AGTGGGTTAC
2151  ATCGAACTGG ATCTCAACAG CGGTAAGATC CTTGAGAGTT TTCGCCCCGA
2201  AGAACGTTTT CCAATGATGA GCACTTTTAA AGTTCTGCTA TGTGGCGCGG
2251  TATTATCCCG TATTGACGCC GGGCAAGAGC AACTCGGTCG CCGCATACAC
2301  TATTCTCAGA ATGACTTGGT TGAGTACTCA CCAGTCACAG AAAAGCATCT
2351  TACGGATGGC ATGACAGTAA GAGAATTATG CAGTGCTGCC ATAACCATGA
2401  GTGATAACAC TGCGGCCAAC TTACTTCTGA CAACGATCGG AGGACCGAAG
2451  GAGCTAACCG CTTTTTTGCA CAACATGGGG GATCATGTAA CTCGCCTTGA
2501  TCGTTGGGAA CCGGAGCTGA ATGAAGCCAT ACCAAACGAC GAGCGTGACA
2551  CCACGATGCC TGTAGCAATG GCAACAACGT TGCGCAAACT ATTAACTGGC
2601  GAACTACTTA CTCTAGCTTC CCGGCAACAA TTAATAGACT GGATGGAGGC
2651  GGATAAAGTT GCAGGACCAC TTCTGCGCTC GGCCCTTCCG GCTGGCTGGT
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B. Sequence of the pRL-SV40 Vector (continued)

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2701  TTATTGCTGA TAAATCTGGA GCCGGTGAGC GTGGGTCTCG CGGTATCATT
2751  GCAGCACTGG GGCCAGATGG TAAGCCCTCC CGTATCGTAG TTATCTACAC
2801  GACGGGGAGT CAGGCAACTA TGGATGAACG AAATAGACAG ATCGCTGAGA
2851  TAGGTGCCTC ACTGATTAAG CATTGGTAAC TGTCAGACCA AGTTTACTCA
2901  TATATACTTT AGATTGATTT AAAACTTCAT TTTTAATTTA AAAGGATCTA
2951  GGTGAAGATC CTTTTTGATA ATCTCATGAC CAAAATCCCT TAACGTGAGT
3001  TTTCGTTCCA CTGAGCGTCA GACCCCGTAG AAAAGATCAA AGGATCTTCT
3051  TGAGATCCTT TTTTTCTGCG CGTAATCTGC TGCTTGCAAA CAAAAAAACC
3101  ACCGCTACCA GCGGTGGTTT GTTTGCCGGA TCAAGAGCTA CCAACTCTTT
3151  TTCCGAAGGT AACTGGCTTC AGCAGAGCGC AGATACCAAA TACTGTTCTT
3201  CTAGTGTAGC CGTAGTTAGG CCACCACTTC AAGAACTCTG TAGCACCGCC
3251  TACATACCTC GCTCTGCTAA TCCTGTTACC AGTGGCTGCT GCCAGTGGCG
3301  ATAAGTCGTG TCTTACCGGG TTGGACTCAA GACGATAGTT ACCGGATAAG
3351  GCGCAGCGGT CGGGCTGAAC GGGGGGTTCG TGCACACAGC CCAGCTTGGA
3401  GCGAACGACC TACACCGAAC TGAGATACCT ACAGCGTGAG CTATGAGAAA
3451  GCGCCACGCT TCCCGAAGGG AGAAAGGCGG ACAGGTATCC GGTAAGCGGC
3501  AGGGTCGGAA CAGGAGAGCG CACGAGGGAG CTTCCAGGGG GAAACGCCTG
3551  GTATCTTTAT AGTCCTGTCG GGTTTCGCCA CCTCTGACTT GAGCGTCGAT
3601  TTTTGTGATG CTCGTCAGGG GGGCGGAGCC TATGGAAAAA CGCCAGCAAC
3651  GCGGCCTTTT TACGGTTCCT GGCCTTTTGC TGGCCTTTTG CTCACATGGC
3701  TCGAC
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VI. Related Products

pRL Family of *Renilla* Luciferase Vectors for Co-Reporter Applications

Product	Size	Cat.#
pRL-TK Vector[a,b]	20µg	E2241
pRL-CMV Vector[a,b,m]	20µg	E2261
pRL-null Vector[a,b]	20µg	E2271

To inquire about the availability of bulk packaging and pricing for pRL Vectors, please contact Promega. For inquiries on the availability of new promoter variations within the pRL family of co-reporter vectors, contact Technical Services or visit our web site at www.promega.com.

pGL-3 Vectors

Product	Size	Cat.#
pGL3 Control Vector[a,f,n]	20µg	E1741
pGL3 Basic Vector[a,f,n]	20µg	E1751
pGL3 Promoter Vector[a,f,n]	20µg	E1761
pGL3 Enhancer Vector[a,f,n]	20µg	E1771

VI. Related Products (continued)

Luciferase Assay Systems

Product	Size	Cat.#
Dual-Luciferase® Reporter Assay System	100 assays	E1910
Dual-Luciferase® Reporter Assay System 10-pack(c,d)	1,000 assays	E1960
Dual-Luciferase® Reporter 1000 Assay System(c,d)	1,000 assays	E1980

Transfection Systems

Product	Size	Cat.#
TransFast™ Transfection Reagent	1.2mg	E2431
Transfectam® Reagent for the Transfection of Eukaryotic Cells	1mg	E1231
	0.5mg	E1232
Tfx™-50 Reagent	2.1mg	E1811
Tfx™-10 Reagent	9.3mg	E2381
Tfx™-20 Reagent	4.8mg	E2391
Tfx™ Reagents Transfection Trio	5.4mg	E2400
ProFection® Mammalian Transfection System - Calcium Phosphate	80 transfections	E1200
ProFection® Mammalian Transfection System - DEAE-Dextran	80 transfections	E1210

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