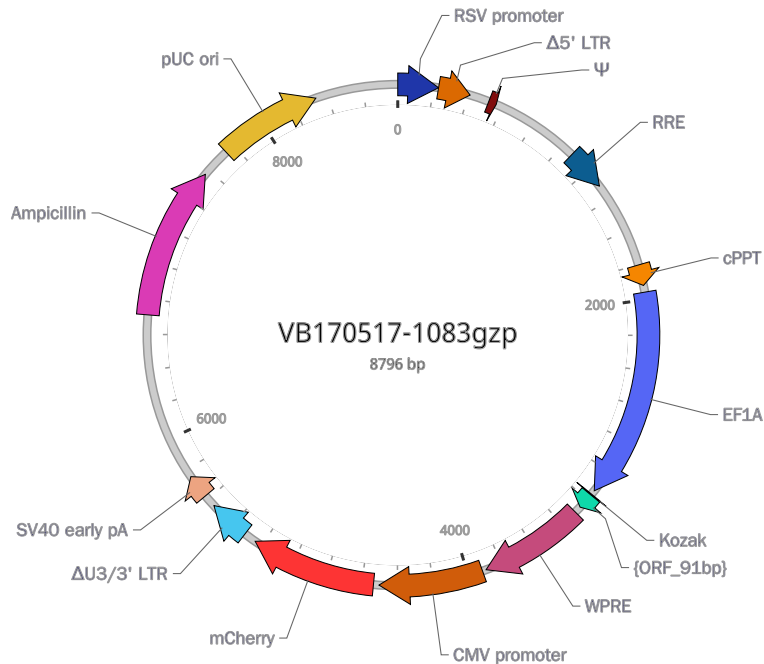


Vector Summary

Vector ID	VB170517-1083gzp
Vector Name	pLV[Exp]-mCherry-EF1A>{ORF_91bp}
Date Created (Pacific Time)	2017-05-17
Size	8796 bp
Vector Type	Lentivirus gene expression vector (3rd generation)
Inserted Promoter	EF1A
Inserted ORF	{ORF_91bp}
Inserted Marker	mCherry
Plasmid Copy Number	High
Antibiotic Resistance	Ampicillin
Cloning Host	Stbl3
Vector Description	<i>None</i>

Vector Map



Vector Components

Name	Position	Size (bp)	Type	Description	Application Notes
RSV promoter	■ 1-229	229	Promoter	Rous sarcoma virus enhancer/promoter	Strong promoter; drives transcription of viral RNA in packaging cells.
Δ5' LTR	■ 230-410	181	LTR	Truncated HIV-1 5' long terminal repeat	Allows transcription of viral RNA and its packaging into virus.
Ψ	■ 521-565	45	Miscellaneous	HIV-1 packaging signal	Allows packaging of viral RNA into virus.
RRE	■ 1075-1308	234	Miscellaneous	HIV-1 Rev response element	Rev protein binding site that allows Rev-dependent nuclear export of viral RNA during viral packaging.
cPPT	■ 1803-1920	118	Miscellaneous	Central polypurine tract	Facilitates the nuclear import of HIV-1 cDNA through a central DNA flap.
EF1A	■ 1959-3137	1179	Promoter	Human eukaryotic translation elongation factor 1 α1 promoter	Strong promoter.
Kozak	■ 3162-3167	6	Miscellaneous	Kozak translation initiation sequence	Facilitates translation initiation of ATG start codon downstream of the Kozak sequence.
{ORF_91bp}	■ 3168-3258	91	ORF	<i>None</i>	<i>None</i>
WPRE	■ 3297-3894	598	Miscellaneous	Woodchuck hepatitis virus posttranscriptional regulatory element	Enhances viral RNA stability in packaging cells, leading to higher titer of packaged virus.
CMV promoter	■ 3916-4503	588	Promoter	Human cytomegalovirus immediate early enhancer/promoter	Strong promoter; may have variable strength in some cell types.
mCherry	■ 4535-5245	711	ORF	Variant of mRFP1 generated by mutagenesis	Commonly used red fluorescent protein; fast maturation compared to its predecessor, mRFP1.
ΔU3/3' LTR	■ 5316-5550	235	LTR	Truncated HIV-1 3' long terminal repeat	Allows packaging of viral RNA into virus; self-inactivates the 5' LTR by a copying mechanism during viral genome integration; contains polyadenylation signal for transcription termination.
SV40 early pA	■ 5623-5757	135	PolyA_signal	Simian virus 40 early polyadenylation signal	Allows transcription termination and polyadenylation of mRNA transcribed by Pol II RNA polymerase.
Ampicillin	■ 6711-7571	861	ORF	Ampicillin resistance gene	Allows E. coli to be resistant to ampicillin.
pUC ori	■ 7742-8330	589	rep_origin	pUC origin of replication	Facilitates plasmid replication in E. coli; regulates high-copy plasmid number (500-700).

Note: Components added by user are listed in **bold red** text.

Vector Sequence

```

1  AATGTAGTCT TATGCAATAC TCTTGTAGTC TTGCAACATG GTAACGATGA GTTAGCAACA TGCCTTACAA GGAGAGAAAA AGCACCGTGC ATGCCGATTG
101 GTGGAAGTAA GGTGGTACGA TCGTGCCTTA TTAGGAAGGC AACAGACGGG TCTGACATGG ATTGGACGAA CCACTGAATT GCCGCATTGC AGAGATATTG
201 TATTTAAGTG CTAGACTCGA TACATAAAGC GGTCTCTCTG GTTAGACCAG ATCTGAGCCT GGGAGCTCTC TGGCTAACTA GGGAAACCCAC TGCTTAAGCC
301 TCAATAAAGC TTGCCTTGAG TGCTTCAAGT AGTGTGTGCC CGTCTGTTGT GTGACTCTGG TAACTAGAGA TCCCTCAGAC CCTTTTAGTC AGTGTGAAAA
401 ATCTCTAGCA GTGGCGCCCG AACAGGGACT TGAAGCGCAA AGGGAACCA GAGGAGCTCT CTCGACGCAG GACTCGGCTT GCTGAAGCGC GCACGGCAAG
501 AGGCGAGGGG CGGCGACTGG TGAGTACGCC AAAAAATTTG ACTAGCGGAG GCTAGAAGGA GAGAGATGGG TGCGAGAGCG TCAGTATTAA GCGGGGGAGA
601 ATTAGATCGC GATGGGAAAA AATTCGGTTA AGGCCAGGGG GAAAGAAAAA ATATAAATTA AAACATATAG TATGGGCAAG CAGGGAGCTA GAACGATTTC
701 CAGTTAATCC TGGCTGTGTA GAAACATCAG AAGGCTGTAG ACAAATACTG GGACAGCTAC AACCATCCCT TCAGACAGGA TCAGAAGAAC TTAGATCATT

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801	ATATAATACA	GTAGCAACCC	TCTATTGTGT	GCATCAAAGG	ATAGAGATAA	AAGACACCAA	GGAAGCTTTA	GACAAGATAG	AGGAAGAGCA	AAACAAAATG
901	AAGACCACCG	CACAGCAAGC	GGCCGCTGAT	CTTCAGACCT	GGAGGAGGAG	ATATGAGGGA	CAATTGGAGA	AGTGAATTAT	ATAAATATAA	AGTAGTAAAA
1001	ATTGAACCAT	TAGGAGTAGC	ACCCACCAAG	GCAAAGAGAA	GAGTGGTGCA	GAGAGAAAAA	AGAGCAGTGG	GAATAGGAGC	TTTGTTCCTT	GGGTCTTGGG
1101	GAGCAGCAGG	AAGCACTATG	GGCGCAGCGT	CAATGACGCT	GACGGTACAG	GCCAGACAAT	TATTTGCTGG	TATAGTGCAG	CAGCAGAACT	ATTTGTCTGAG
1201	GGCTATTGAG	GGCAACACAG	ATCTGTTGCA	ACTCACAGTC	TGGGGCATCA	AGCAGATCCA	GGCAAGAATC	CTGGCTGTGG	AAAGATACTT	AAAGGATCAA
1301	CAGCTCTGGG	GGATTTGGGG	TTGCTCTGGA	AAACTCATTT	GCACCACTGC	TGTGCCTTGG	AATGTAGTTC	GGAGTAAATA	ATCTCTGGAA	CAGATTTGGA
1401	ATCACACGAC	CTGGATGGAG	TGGGACAGAG	AAATTAACAA	TTACACAAGC	TTAATACACT	CCTTAATTGA	AGAATCGCAA	AACCAGCAAG	AAAAGAATGA
1501	ACAAGAATTA	TTGGAATTAG	ATAAATGGGC	AAGTTTGTGG	AATTTGGTTA	ACATAACAAA	TTGGCTGTGG	TATATAAAAT	TATTCATAAT	GATAGTAGGA
1601	GGCTTTGGTAG	GTTTTAAGAA	AGTTTTTGTCT	GTACTTTTCTA	TAGTGAATAG	AGTTAGGCAG	GGATATTCAC	CATTATTCGT	TCAGACCACCT	CTCCAACCC
1701	CGAGGGGACC	CGACAGGCC	GAAGGAATAG	AAGAAGAAGG	TGGAGAGAGA	GACAGAGACA	GATCCATTCC	ATTAGTGAAC	GGATCTCGAC	GGTATCGCTA
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1901	TTACAAAAAT	TCAAAATTTT	ACTAGTGATT	ATCGGATCAA	CTTTGTATAG	AAAAGTTGCG	CTCCGGTGCC	CGTCAGTGGG	CAGAGCGCAC	ATCCGCCACA
2001	GTCCCCGAGA	AGTTGGGGGG	AGGGGCTGCC	AATTTGAACCG	GTGCCTAGAG	AAAAGTTGCG	GGGTAAACTT	GGGTAAGTGA	TGTCGTGTAC	TGGCTCCGCC
2101	TTTTTCCCGA	GGGTGGGGGA	GAACCGTATA	TAAGTGCAGT	AGTCGCCGTG	AACGTTCTTT	TTCCGCAACGG	GTTTGGCCGC	AGAACACAGG	TAAGTGCCTT
2201	GTGTGGTTCG	CGCGGGCCTG	GGCTTCTTAC	GGGTTATGGC	CCTTGCCTGC	TTTGAATTAC	TTCCACCTGG	CTGCAGTACG	TGATTCTTGA	TCCCGAGCTT
2301	CGGTTGGAA	GTTGGTGGA	GAGTTCGAGG	CGCTTCCGCT	AAAAGGCCCC	CGTTGCTGTG	TTCCGCTTGC	AGGCCTGGCC	TGGGCGTGG	TGGGCGCGCC
2401	TGCGAATCTG	GTGGCACCTT	CGCGCTGTCT	TCGCTGCTTT	CGATAAGTCT	CTAGCCATTT	AAAAATTTTG	ATGACCTGCT	GCGACGTTT	TTTTCTGGCA
2501	AGATAGTCTT	GTAAATCGCG	GCCAAGATCT	GCACACTGGT	ATTTCCGTTT	TTGGGGCCGC	GGGCGGGCAG	GGGGCCCGTG	CGTCGCCAGG	CACATGTTCC
2601	CGAGGCGCGG	CCCTGCGAGC	GGCCACCCCG	AGAATCGGAC	GGGGTAGTCT	TCAAGTGGC	CGCCCTGTCT	CCGCTCTGG	TCTCCGCCCG	CCGTGTATCG
2701	CCCCGCCCTG	GGCGGCAAGG	CTGGCCCGGT	CGCCACCACT	TGCGTGAGCG	GAAAGATGGC	CGCTTCCCGG	CCCTGCTGCA	GGGAGCTCAA	AATGGAGGAC
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2901	TCGTCCAGG	ACCTCGATTA	GTTCTCGAGC	TTTTGGAGTA	CGTCGTTCTT	AGGTTGGGGT	GAGGGTTTTT	ATGCGTATGA	GTTTCCCCAC	ACTGAGTGGG
3001	CGGACAGTGA	AGTTAGGCCA	CTTTGGCACT	TGATGTAACT	CTCTTGTGAA	TTTTGCCCCTT	TTGAGTTTGG	ATCTTGGTTC	ATTTCTCAAGC	CTCAGCAGCT
3101	GGTCAAAGT	TTTTTTCTTC	CATTTGAGT	GTCGTGACAA	GTTTGTACAA	AAAAGCAGGC	TGCCACC AAT	TCGAATTCTT	AGCGGATCCA	ATTGCTCGAG
3201	CGAAGAGCGG	CGCGAAGGTT	GACAATTAAT	TAACGTTAAC	AAACCAGGTA	TCGATAAAC	CCAGCTTTCT	TGTAACAAGT	GGTGATAACT	GAATTTCCGAT
3301	AATCAACCTC	TGGATTACAA	AATTTGTGAA	AGATTGACTG	GTATTTCTAA	CTATGTGTCT	CCTTTTACGC	TATGTGGATA	TCTGTCTTTA	ATGCTTTTGT
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3601	ATTGCCACGG	CGGAACCTAT	CGCCGCTGCG	CTTCCCGCTC	GCTGGACAGG	GGCTCGGCTG	TTGGGCATCT	ACAATTCGGT	GGTGTGTGCG	GGGAAGCTGA
3701	CGTCCCTTTC	GTGGAGTCTT	GCCTGTGTTG	CCACCTGGAT	TCTGCCTGGG	ACGCTCTTCT	GCTACGCTCC	TTTCCGCCCTC	AATCCAGCGG	ACCTTCTTTC
3801	CGCGGCGCTG	CTCCGCGCTC	TGCGGCTCTT	TCCGCTGCTT	CGCCTTCGCC	CTCAGACGAG	TCGGATCTCC	CTTTGGCCCG	CCTCCCGCGA	TCGGGAATTC
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4101	TTCCATTGAC	GTCAATGGGT	GGAGTATTTA	CGGTAACAG	CCCAGCTGGC	AGTACATCAA	GTGTATCATA	TGCCAAGTAC	GCCCCCTATT	GACGTCAATG
4201	ACGGTAAAGT	GCCCCGCTGG	CATTATGCC	AGTACATGAC	CTTATGGGAC	TTTCTACTTT	GGCAGTACAT	CTACGTATTA	GTCATCGCTA	TTACCATGTT
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4401	CACCAAAATC	AACGGGACTT	TCCAATAATG	CGTAAACAG	CGGCCCTATT	GAGCAAAATG	GGCGGTAGGC	GTGTACGGTG	TGAAGTCTAT	ATAAGCAGAG
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4801	GCTGTCTTTC	CCCGAGGGCT	TCAAGTGGGA	GCGCGTGATG	AACTTCGAGG	ACGGCGCGGT	GGTGACCGTG	ACCCAGGACT	CCTCCCTGCA	GGACGGCGAG
4901	TTCATCTACA	AGGTGAAGCT	GCGCGGCACT	AACTTCCCCT	CCGACGGCCC	CGTAAATGCA	AAGAAAGCCA	TGGGTGGGA	GGCCTCCTCC	GAGCGGATGT
5001	ACCCCGAGGA	CGCCGCTGCG	AAGGGCGAGA	TCAAGCAGAG	GCTGAAGCTG	AAGACCGCGC	GCCACTACGA	CGCTGAGTGC	AAGACGCTCC	ACAAGGCTTA
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5601	TGAATATCAG	AGAGTGGAG	GAATCTGTTT	ATTGACGTT	ATAATGGTTA	CAAATAAAGC	AATAGCATCA	CAAATTTTCA	AAATAAAGCA	TTTTTTTTAC
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6001	AACCTGGCCG	TTACCAACT	TAATCGCTTT	CGCAGCATC	CCCCTTTCG	CAGCTGGCTG	AATAGCGAAG	AGGCCCGCAC	CGATCGCCCT	TCCCAACAGT
6101	TGCGCAGCGT	GAATGGGAAA	TGGGACGCGC	CCCTGTAGCG	CGCATATAAG	CGCGCGGGTG	TGTTGGTTAC	GCGCAGCGTG	ACCGCTACAC	TTGCCAGCGC
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6801	GTAAGAGATG	CTGAAGATCA	GTTGGGTGCA	GTCAGTGGTT	ACATCGAACT	GGATCTCAAC	AGCCTGAA	TCCTTGAGAG	TTTTCGCCCC	GAAGAACGTT
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7001	GAATGACTTG	GTTGAGTACT	CACCACTGTC	AGAAAAGCAT	CTTAGCGGAT	GCATGACAGT	AAGAAATTA	TGCAGTGCTG	CCATAACCCT	GAGTGATAAC
7101	ACTCGGCCA	ACTTACTTCT	GACAACGATC	GGAGGACCGA	AGGACCTAAC	CGCTTTTTTG	CACAAATG	GGATCATGT	AACTCGCCTT	GATCGTTGGG
7201	AACCGGAGCT	GAATGAAGCC	ATACCAAACG	ACGAGCGTGA	CACCACGATG	CCTGTAGCAA	TGGCAACAA	GTTGCGCAAA	CTATTAACCTG	GCGAACTACT
7301	TACTCTAGCT	TCCCGGCAAC	AATTAATAGA	CTGGATGGAG	GCGGATAAAG	TTGCAGGACC	ACTTTGCGC	TCGGCCCTTC	CGGCTGGCTG	GTTTATGGCT
7401	GATAAATCTG	GAGCGGGTGA	CGTGGGTCTG	CGGCTATCA	TGTCAGACT	GGGCCAGAT	GGTAAGCCCT	CCGCTATCGT	AGTTATCTAC	ACGACGGGGA
7501	GTCAGGCAAC	TATGGATGAA	CGAAAATGAC	AGATGCTGTA	GATAGGTGCC	TCACTGATTA	AGCATTGTTA	ACTGTACAGC	CAAGTTTTACT	CATATATACT
7601	TTAGATTGAT	TTAAAACCTC	ATTTTTAATT	TAAAAGGATC	TAGGTGAAGA	TCCTTTTTGA	TAATCTCATG	ACCAAAATCC	CTTAACGTGA	GTTTTCTGCT
7701	CACGTAGGCT	CAGACCCTGC	AGAAAAGATC	AAAGGATCTT	TTTTGAGATCC	TTTTTTTCTG	CGCGTAATCT	GCTGCTTGGA	AACAAAAGAA	CCACCCTTAC
7801	CAGCGGTGGT	TTGTTTGGCG	GATCAAGAGC	TACCAACTCT	TTTTCCGAA	GTAACTTGCT	TACAGCAGAG	GCTAGTACCA	AAACTGTCTT	TTCTAGTGT
7901	GCCGTAGTTA	GGCCACCACT	TCAAGAACTC	TGTAGCACCG	CCTACATACT	TCGCTCTGCT	AATCCTGTTA	CCAGTGGCTG	CTGCCAGTGG	CGATAAGTCG
8001	TGCTTACCG	GGTTGGACTC	AAGACGATAG	TTACCGGATA	AGGGGACGCG	GTGCGGCTGA	ACGGGGGTT	CGTGCACATA	GCCCAGTCTG	GAGCGAACGA
8101	CCTACACAGA	ACTGAGATAC	CTACAGCGTG	AGCTATGAGA	AAGGCCACG	CTGGCCGGA	AGAAAGAGG	GGACAGGATG	CCGGTAAAGC	GCAGGGCTCG
8201	AACAGGAGAG	CGCACGAGGG	AGCTTCCAGG	GGGAAACGCC	TGGTATCTTT	ATAGTCTGTG	CGGGTTTCCG	CACCTCTGAC	TTGAGCGTGC	ATTTTTGTGA
8301	TGCTCGTACG	GGGGCGGAG	CCTATGGAAA	AACGCGAGCA	ACGCGGCCCT	TTTACGGTTC	CTGGCCTTTT	GCTGGCCTTT	TGCTCACATG	TTCTTTCTGG
8401	CGTTATCCCC	TGATTTCTGT	GATAACCGTA	TTACTCCCTT	TGATGTGAGT	GATACGCTTC	GCCGACGCGC	AACGACCAGG	CGCACGAGT	CAGTGAGCGG
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8601	AGTGAGCGCA	ACGCAATTA	TGTGAGTTAG	CTCACTCATT	AGGCACCCA	GGCTTTACAC	TTTATGCTTC	CGGCTCGTAT	GTTGTGTGGA	ATTGTGAGCG
8701	GATAACAATT	TCACACAGGA	AACAGCTATG	ACCATGATTA	CGCCAAGCGC	GCAATTAACC	CTCACTAAAG	GGAAACAAA	CTGGAGCTGC	AAGCTT

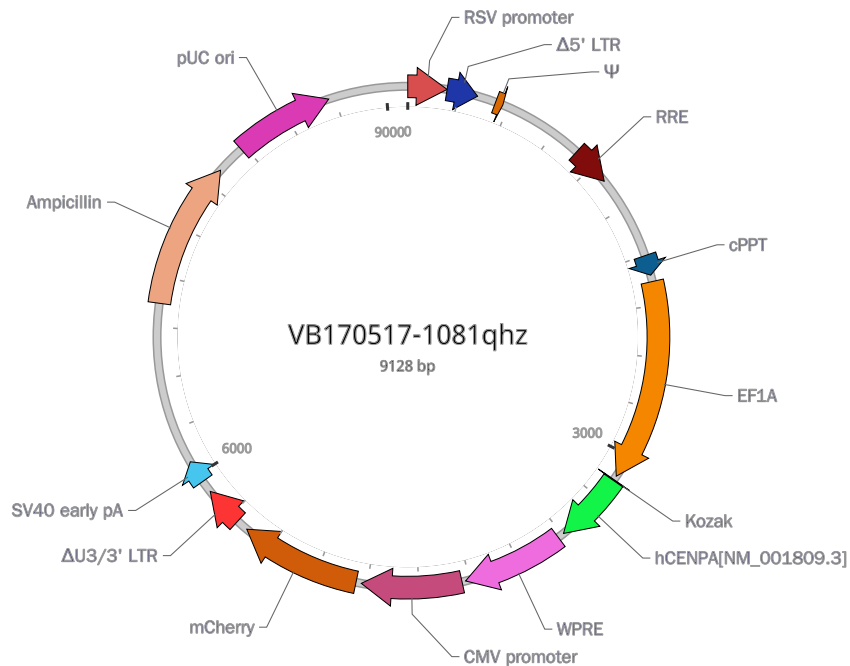
Validation by Restriction Enzyme Digestion

Cutters	Locations	Fragments (bp)
PacI	3231	8796
HpaI	3238	8796
ApaI	3511, 4596, 6827, 8073	1085, 2231, 1246, 4234
BamHI	3185	8796
EcoRI	3174, 3292, 3896	118, 604, 8074
ApaI+HpaI	3238, 3511, 4596, 6827, 8073	273, 1085, 2231, 1246, 3961
ApaI+PacI	3231, 3511, 4596, 6827, 8073	280, 1085, 2231, 1246, 3954
ApaI+BamHI	3185, 3511, 4596, 6827, 8073	326, 1085, 2231, 1246, 3908
ApaI+EcoRI	3174, 3292, 3511, 3896, 4596, 6827, 8073	118, 219, 385, 700, 2231, 1246, 3897

Vector Summary

Vector ID	VB170517-1081qhz
Vector Name	pLV[Exp]-mCherry-EF1A>hCENPA[NM_001809.3]
Date Created (Pacific Time)	2017-05-17
Size	9128 bp
Vector Type	Lentivirus gene expression vector (3rd generation)
Inserted Promoter	EF1A
Inserted ORF	hCENPA[NM_001809.3]
Inserted Marker	mCherry
Plasmid Copy Number	High
Antibiotic Resistance	Ampicillin
Cloning Host	Stbl3
Vector Description	<i>None</i>

Vector Map



Vector Components

Name	Position	Size (bp)	Type	Description	Application Notes
RSV promoter	■ 1-229	229	Promoter	Rous sarcoma virus enhancer/promoter	Strong promoter; drives transcription of viral RNA in packaging cells.
Δ5' LTR	■ 230-410	181	LTR	Truncated HIV-1 5' long terminal repeat	Allows transcription of viral RNA and its packaging into virus.
Ψ	■ 521-565	45	Miscellaneous	HIV-1 packaging signal	Allows packaging of viral RNA into virus.
RRE	■ 1075-1308	234	Miscellaneous	HIV-1 Rev response element	Rev protein binding site that allows Rev-dependent nuclear export of viral RNA during viral packaging.
cPPT	■ 1803-1920	118	Miscellaneous	Central polypurine tract	Facilitates the nuclear import of HIV-1 cDNA through a central DNA flap.
EF1A	■ 1959-3137	1179	Promoter	Human eukaryotic translation elongation factor 1 α1 promoter	Strong promoter.
Kozak	■ 3162-3167	6	Miscellaneous	Kozak translation initiation sequence	Facilitates translation initiation of ATG start codon downstream of the Kozak sequence.
hCENPA[NM_001809.3]	■ 3168-3590	423	ORF	<i>None</i>	<i>None</i>
WPRE	■ 3629-4226	598	Miscellaneous	Woodchuck hepatitis virus posttranscriptional regulatory element	Enhances viral RNA stability in packaging cells, leading to higher titer of packaged virus.
CMV promoter	■ 4248-4835	588	Promoter	Human cytomegalovirus immediate early enhancer/promoter	Strong promoter; may have variable strength in some cell types.
mCherry	■ 4867-5577	711	ORF	Variant of mRFP1 generated by mutagenesis	Commonly used red fluorescent protein; fast maturation compared to its predecessor, mRFP1.
ΔU3/3' LTR	■ 5648-5882	235	LTR	Truncated HIV-1 3' long terminal repeat	Allows packaging of viral RNA into virus; self-inactivates the 5' LTR by a copying mechanism during viral genome integration; contains polyadenylation signal for transcription termination.
SV40 early pA	■ 5955-6089	135	PolyA_signal	Simian virus 40 early polyadenylation signal	Allows transcription termination and polyadenylation of mRNA transcribed by Pol II RNA polymerase.
Ampicillin	■ 7043-7903	861	ORF	Ampicillin resistance gene	Allows E. coli to be resistant to ampicillin.
pUC ori	■ 8074-8662	589	rep_origin	pUC origin of replication	Facilitates plasmid replication in E. coli; regulates high-copy plasmid number (500-700).

Note: Components added by user are listed in **bold red** text.

Vector Sequence

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1  AATGTAGTCT TATGCAATAC TCTTGTAGTC TTGCAACATG GTAACGATGA GTTAGCAACA TGCCTTACAA GGAGAGAAAA AGCACCGTGC ATGCCGATTG
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201 TATTTAAGTG CCTAGCTCGA TACATAAACG GGTCTCTCTG GTTAGACCAG ATCTGAGCCT GGGAGCTCTC TGGCTAACTA GGAACCCAC TGCTTAAGCC
301 TCAATAAAGC TTGCCTTGAG TGCTTCAAGT AGTGTGTGCC CGTCTGTTGT GTGACTCTGG TAACTAGAGA TCCCTCAGAC CCTTTAGTC AGTGTGGAAA
401 ATCTCTAGCA GTGGCGCCCG AACAGGGACT TGAAAGCGAA AGGGAACCA GAGGAGCTCT CTCGACGCAG GACTCGGCTT GCTGAAGCGC GCACGGCAAG

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Table with 12 columns of DNA sequence data, numbered 501 to 8801. Each row contains a sequence of 12 nucleotide strings.


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8901 GGCACGACAG GTTTCCCGAC TGGAAAGCGG GCAGTGAGCG CAACGCAATT AATGTGAGTT AGCTCACTCA TTAGGCACCC CAGGCTTTAC ACTTTATGCT
9001 TCCGGCTCGT ATGTTGTGTG GAATTGTGAG CGGATAACAA TTTCACACAG GAAACAGCTA TGACCATGAT TACGCCAAGC GCGCAATTAA CCCTCACTAA
9101 AGGGAACAAA AGCTGGAGCT GCAAGCTT
  
```

Validation by Restriction Enzyme Digestion

Cutters	Locations	Fragments (bp)
XhoI	2925	9128
AgeI	2038	9128
SpeI	1922, 4266	2344, 6784
ApaLI	3843, 4928, 7159, 8405	1085, 2231, 1246, 4566
DraIII	2996, 6691	3695, 5433
ApaLI+XhoI	2925, 3843, 4928, 7159, 8405	918, 1085, 2231, 1246, 3648
ApaLI+AgeI	2038, 3843, 4928, 7159, 8405	1805, 1085, 2231, 1246, 2761
ApaLI+SpeI	1922, 3843, 4266, 4928, 7159, 8405	1921, 423, 662, 2231, 1246, 2645
ApaLI+DraIII	2996, 3843, 4928, 6691, 7159, 8405	847, 1085, 1763, 468, 1246, 3719