SUPPORTING INFORMATION

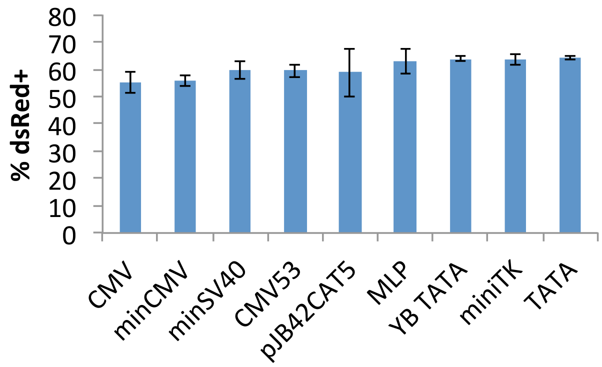

Figure S1. The panel of core promoter constructs has similar transfection efficiencies in HEK 293T cells. Plasmids encoding different core promoters as shown in Figure 1 were transiently transfected into HEK 293T cells. DsRed-Express fluorescence was quantified by flow cytometry, and the percent of viable singlets that express dsRed-Express were determined by population gating. Values shown are the means of triplicates with error bars indicating ± 1 s.d.

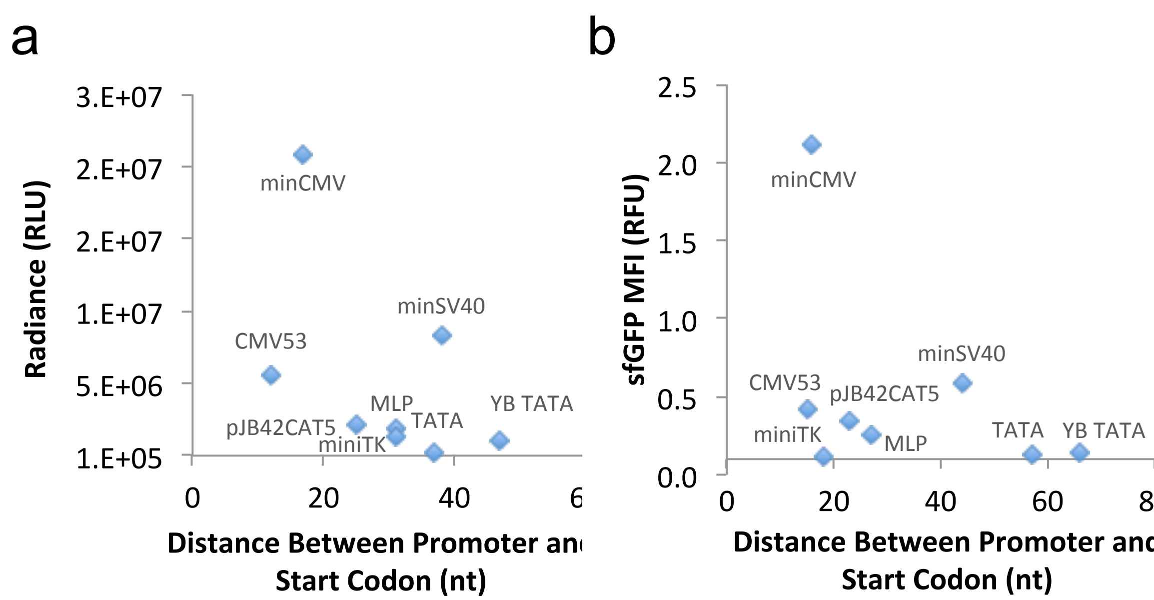

Figure S2. Variation in basal expression level from core promoters is not an artifact of plasmid cloning. Each core promoter was cloned into the same plasmid backbone, but the cloning process resulted in variations in the number of nucleotides between the end of each promoter and the start codon. Plasmids encoding (a) Gluc or (b) sfGFP show basal expression levels that do not correlate with the distance between the promoter and the start codon on each plasmid.

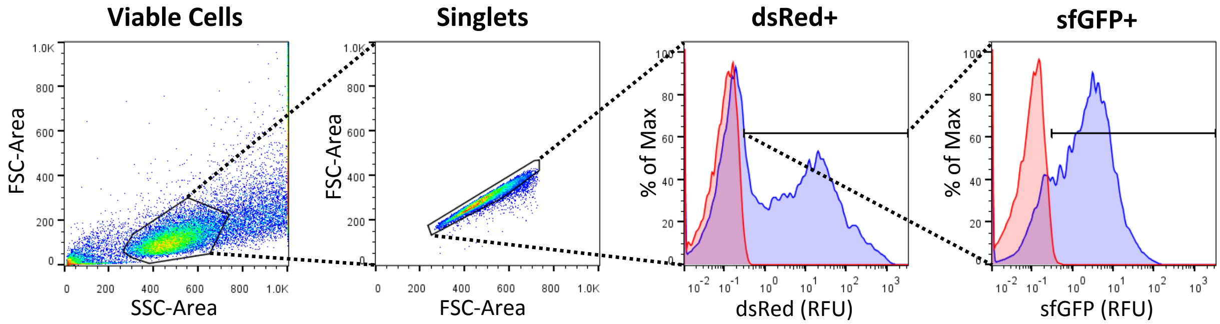

Figure S3. Population gating strategy for flow cytometry data. Cells were first gated for viability based on side scatter (SSC) and forward scatter (FSC). The singlet gate removed cell clusters. Transfected cells were gated based on dsRed expression, since all plasmids used in transient transfection experiments in this study contained dsRed expressed from a constitutive CMV promoter. Finally, reporter-expressing cells among transfected cells were identified within the sfGFP+ gate among viable/singlet/dsRed+ cells.

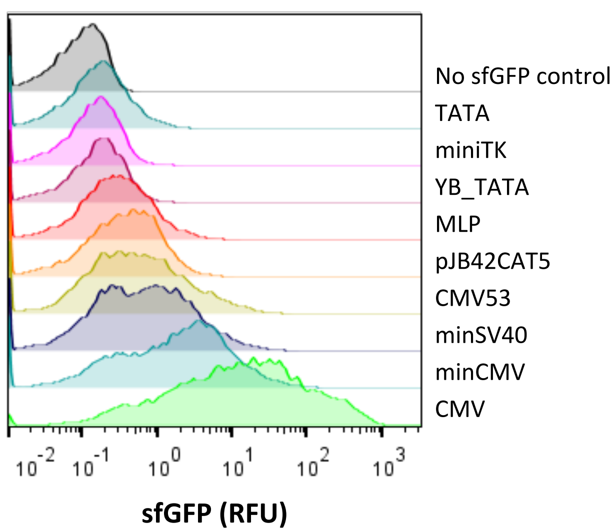

Figure S4. Gene expression by core promoters in the uninduced state. HEK 293T cells transiently transfected with plasmids encoding sfGFP expressed from various core promoters without response elements were analyzed by flow cytometry. The intensity of sfGFP fluorescence is shown for the viable/singlet/dsRed+ population.

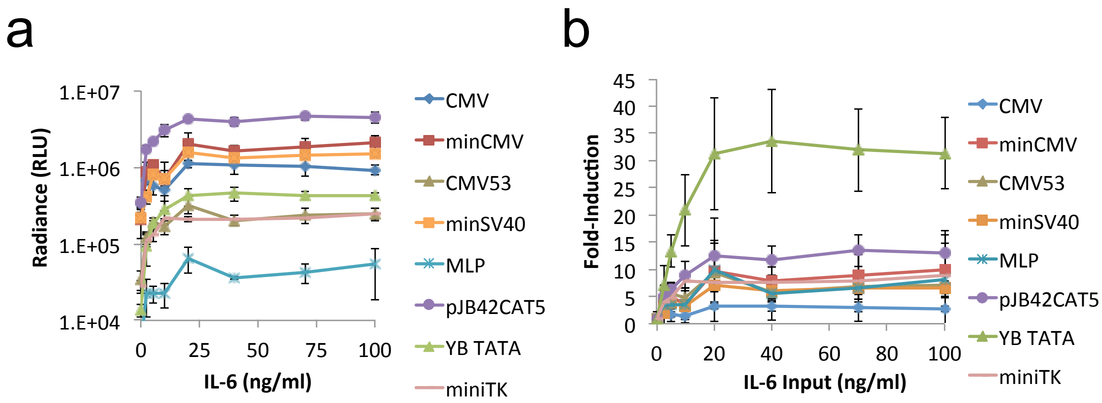

Figure S5. Gluc output and fold-induction of IL-6–responsive transcription systems in transiently transfected HEK 293T cells. The panel of core promoters was coupled to four copies of the IL-6–responsive JRE-IL6 response element to drive the expression of Gluc. (a) Gluc activity in the supernatant of cells cultured with various concentrations of IL-6. (b) Fold-induction in Gluc activity (normalized to 0 ng/ml IL-6 input). Values shown are the means of triplicates with error bars indicating ± 1 s.d.

Table S1. Core Promoter Sequences

Promoter	Sequence
minCMV	GTAGGCGTGTACGGTGGGAGGTC**TATATAA**GCAGAGCTCGTTTAGTGAACCGTCAGATC[a]
CMV53	CAACAAAATGTCGTAACAAGGGCGGTAGGCGTGTACGGTGGGAGGTC**TATATAA**GCAGAGCTCGTTTAGTGAACCG[b]
minSV40	TGCATCTCAATTAGTCAGCAACCATAGTCCCGCCCCTAACTCCGCCCATCCCGCCCCTAACTCCGCCCAGTTCCGCCCATTCTCCGCCCCATCGCTGACTAATTTTTTT**TATTTAT**GCAGAGGCCGAGGCCGCCTCGGCCTCTGAGCTATTCCAGAAGTAGTGAGGAGGCTTTTTTGGAGGCCTAGGCTTTTGCAAAAAGCTT
miniTK	TTCGC**ATATTAA**GGTGACGCGTGTGGCCTCGAACACCGAGCGACCCTGCAGCGACCCGCTTAA
MLP	GGGGGGC**TATAAAA**GGGGGTGGGGGCGTTCGTCCTCACTCT
pJB42CAT5	CTGACAAATTCAG**TATAAAA**GCTTGGGGCTGGGGCCGAGCACTGGGGACTTTGAGGGTGGCCAGGCCAGCGTAGGAGGCCAGCGTAGGATCCTGCTGGGAGCGGGGAACTGAGGGAAGCGACGCCGAGAAAGCAGGCGTACCACGGAGGGAGAGAAAAGCTCCGGAAGCCCAGCAGCG[c]
YB_TATA	TCTAGAGGG**TATATAAT**GGGGGCCA
TATA	**TATAAAA**G

[a]Bold letters indicate the TATA box consensus sequence.
[b]Underlined letters indicate the GC box consensus sequence.
[c]Blue letters indicate an additional B-recognition element found in pJB42CAT5.[1]

Reference:

[1] Lagrange, T., Kapanidis, A. N., Tang, H., Reinberg, D., and Ebright, R. H. (1998) New core promoter element in RNA polymerase II-dependent transcription: sequence-specific DNA binding by transcription factor IIB, *Genes Dev 12*, 34-44.

Supplementary Text 1. Plasmid Sequence for YB_TATA-Gluc

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Supplementary Text 2. Plasmid Sequence for HREx4-YB_TATA- Gluc

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4681 GTTACAAATA AAGCAATAGC ATCACAAATT TCACAAATAA AGCATTTTTT TCACTGCATT
4741 CTAGTTGTGG TTTGTCCAAA CTCATCAATG TATCTTATCA TGTCTGTATA CCGTCGACCT
4801 CTAGCTAGAG CTTGGCGTAA TCATGGTCAT AGCTGTTTCC TGTGTGAAAT TGTTATCCGC
4861 TCACAATTCC ACACAACATA CGAGCCGGAA GCATAAAGTG TAAAGCCTGG GGTGCCTAAT
4921 GAGTGAGCTA ACTCACATTA ATTGCGTTGC GCTCACTGCC CGCTTTCCAG TCGGGAAACC
4981 TGTCGTGCCA GCTGCATTAA TGAATCGGCC AACGCGCGGG GAGAGGCGGT TTGCGTATTG
5041 GGCGCTCTTC CGCTTCCTCG CTCACTGACT CGCTGCGCTC GGTCGTTCGG CTGCGGCGAG
5101 CGGTATCAGC TCACTCAAAG GCGGTAATAC GGTTATCCAC AGAATCAGGG GATAACGCAG
5161 GAAAGAACAT GTGAGCAAAA GGCCAGCAAA AGGCCAGGAA CCGTAAAAAG GCCGCGTTGC
5221 TGGCGTTTTT CCATAGGCTC CGCCCCCCTG ACGAGCATCA CAAAAATCGA CGCTCAAGTC
5281 AGAGGTGGCG AAACCCGACA GGACTATAAA GATACCAGGC GTTTCCCCCT GGAAGCTCCC
5341 TCGTGCGCTC TCCTGTTCCG ACCCTGCCGC TTACCGGATA CCTGTCCGCC TTTCTCCCTT
5401 CGGGAAGCGT GGCGCTTTCT CATAGCTCAC GCTGTAGGTA TCTCAGTTCG GTGTAGGTCG
5461 TTCGCTCCAA GCTGGGCTGT GTGCACGAAC CCCCCGTTCA GCCCGACCGC TGCGCCTTAT
5521 CCGGTAACTA TCGTCTTGAG TCCAACCCGG TAAGACACGA CTTATCGCCA CTGGCAGCAG
5581 CCACTGGTAA CAGGATTAGC AGAGCGAGGT ATGTAGGCGG TGCTACAGAG TTCTTGAAGT

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5641 GGTGGCCTAA CTACGGCTAC ACTAGAAGAA CAGTATTTGG TATCTGCGCT CTGCTGAAGC
5701 CAGTTACCTT CGGAAAAAGA GTTGGTAGCT CTTGATCCGG CAAACAAACC ACCGCTGGTA
5761 GCGGTTTTTT TGTTTGCAAG CAGCAGATTA CGCGCAGAAA AAAAGGATCT CAAGAAGATC
5821 CTTTGATCTT TTCTACGGGG TCTGACGCTC AGTGGAACGA AAACTCACGT TAAGGGATTT
5881 TGGTCATGAG ATTATCAAAA AGGATCTTCA CCTAGATCCT TTTAAATTAA AAATGAAGTT
5941 TTAAATCAAT CTAAAGTATA TATGAGTAAA CTTGGTCTGA CAGTTACCAA TGCTTAATCA
6001 GTGAGGCACC TATCTCAGCG ATCTGTCTAT TTCGTTCATC CATAGTTGCC TGACTCCCCG
6061 TCGTGTAGAT AACTACGATA CGGGAGGGCT TACCATCTGG CCCCAGTGCT GCAATGATAC
6121 CGCGAGACCC ACGCTCACCG GCTCCAGATT TATCAGCAAT AAACCAGCCA GCCGGAAGGG
6181 CCGAGCGCAG AAGTGGTCCT GCAACTTTAT CCGCCTCCAT CCAGTCTATT AATTGTTGCC
6241 GGGAAGCTAG AGTAAGTAGT TCGCCAGTTA ATAGTTTGCG CAACGTTGTT GCCATTGCTA
6301 CAGGCATCGT GGTGTCACGC TCGTCGTTTG GTATGGCTTC ATTCAGCTCC GGTTCCCAAC
6361 GATCAAGGCG AGTTACATGA TCCCCCATGT TGTGCAAAAA AGCGGTTAGC TCCTTCGGTC
6421 CTCCGATCGT TGTCAGAAGT AAGTTGGCCG CAGTGTTATC ACTCATGGTT ATGGCAGCAC
6481 TGCATAATTC TCTTACTGTC ATGCCATCCG TAAGATGCTT TTCTGTGACT GGTGAGTACT
6541 CAACCAAGTC ATTCTGAGAA TAGTGTATGC GGCGACCGAG TTGCTCTTGC CCGGCGTCAA
6601 TACGGGATAA TACCGCGCCA CATAGCAGAA CTTTAAAAGT GCTCATCATT GGAAAACGTT
6661 CTTCGGGGCG AAAACTCTCA AGGATCTTAC CGCTGTTGAG ATCCAGTTCG ATGTAACCCA
6721 CTCGTGCACC CAACTGATCT TCAGCATCTT TTACTTTCAC CAGCGTTTCT GGGTGAGCAA
6781 AAACAGGAAG GCAAAATGCC GCAAAAAAGG GAATAAGGGC GACACGGAAA TGTTGAATAC
6841 TCATACTCTT CCTTTTTCAA TATTATTGAA GCATTTATCA GGGTTATTGT CTCATGAGCG
6901 GATACATATT TGAATGTATT TAGAAAAATA AACAAATAGG GGTTCCGCGC ACATTTCCCC
6961 GAAAAGTGCC ACCTGACGTC
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13..179	4xHRE
32..62	HREv2 consensus #1
71..101	HREv2 consensus #2
110..140	HREv2 consensus #3
149..179	HREv2 consensus #4
197..221	Minimal Promoter – YB_TATA
269..826	Gaussia Luciferase
871..1095	bGHpA
1195..1752	CMV
1871..2548	dsRed Express
2580..2804	bGHpA
2850..3278	f1 ori
3283..3653	SV40 Early Promoter
3688..4482	NeoR
4656..4787	SV40 PA
5840..5169	pUC
6844..5984	AmpR
6943..6845	Bla Promoter

Supplementary Text 3. Plasmid Sequence for JREIL6x4-YB_TATA-Gluc

1 GACGGATCGG GAGATCTTCG CGATTAATTA AGCGCTTCCT GACAGTGACG CGAGCCGGCG

61 ATTAAGCGCT TCCTGACAGT GACGCGAGCC GGCGATTAAG CGCTTCCTGA CAGTGACGCG

121 AGCCGGCGAT TAAGCGCTTC CTGACAGTGA CGCGAGCCGG CGATTAATCC ATATGCTCTA

181 GAGGGTATAT AATGGGGGCC ACTAGTCTAC TACCAGAAAG CTTGGTACCG AGCTCGGATC

241 CAGCCACCAT GGGAGTCAAA GTTCTGTTTG CCCTGATCTG CATCGCTGTG GCCGAGGCCA

301 AGCCCACCGA GAACAACGAA GACTTCAACA TCGTGGCCGT GGCCAGCAAC TTCGCGACCA

361 CGGATCTCGA TGCTGACCGC GGGAAGTTGC CCGGCAAGAA GCTGCCGCTG GAGGTGCTCA

421 AAGAGATGGA AGCCAATGCC CGGAAAGCTG GCTGCACCAG GGGCTGTCTG ATCTGCCTGT

481 CCCACATCAA GTGCACGCCC AAGATGAAGA AGTTCATCCC AGGACGCTGC CACACCTACG

541 AAGGCGACAA AGAGTCCGCA CAGGGCGGCA TAGGCGAGGC GATCGTCGAC ATTCCTGAGA

601 TTCCTGGGTT CAAGGACTTG GAGCCCATGG AGCAGTTCAT CGCACAGGTC GATCTGTGTG

661 TGGACTGCAC AACTGGCTGC CTCAAAGGGC TTGCCAACGT GCAGTGTTCT GACCTGCTCA

721 AGAAGTGGCT GCCGCAACGC TGTGCGACCT TTGCCAGCAA GATCCAGGGC CAGGTGGACA

781 AGATCAAGGG GGCCGGTGGT GACTAAGCGG CCGCCTAGAG GGCCCGTTTA AACCCGCTGA

841 TCAGCCTCGA CTGTGCCTTC TAGTTGCCAG CCATCTGTTG TTTGCCCCTC CCCCGTGCCT

901 TCCTTGACCC TGGAAGGTGC CACTCCCACT GTCCTTTCCT AATAAAATGA GGAAATTGCA

961 TCGCATTGTC TGAGTAGGTG TCATTCTATT CTGGGGGGTG GGGTGGGGCA GGACAGCAAG

1021 GGGGAGGATT GGGAAGACAA TAGCAGGCAT GCTGGGGATG CGGTGGGCTC TATGGCCGCG

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1141 GCGCTGCTTC GCGATGTACG GGCCAGATAT ACGCGTTGAC ATTGATTATT GACTAGTTAT

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1381 GAGTATTTAC GGTAAACTGC CCACTTGGCA GTACATCAAG TGTATCATAT GCCAAGTACG

1441 CCCCCTATTG ACGTCAATGA CGGTAAATGG CCCGCCTGGC ATTATGCCCA GTACATGACC

1501 TTATGGGACT TTCCTACTTG GCAGTACATC TACGTATTAG TCATCGCTAT TACCATGGTG

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1621 AGTCTCCACC CCATTGACGT CAATGGGAGT TTGTTTTGGC ACCAAAATCA ACGGGACTTT

1681 CCAAAATGTC GTAACAACTC CGCCCCATTG ACGCAAATGG GCGGTAGGCG TGTACGGTGG

1741 GAGGTCTATA TAAGCAGAGC TCTCTGGCTA ACTAGAGAAC CCACTGCTTA CTGGCTTATC

1801 GAAATTAATA CGACTCACTA TAGGGAGACC CAAGCTGGCT AGCCGCCACC ATGGCCTCCT

1861 CCGAGGACGT CATCAAGGAG TTCATGCGCT TCAAGGTGCG CATGGAGGGC TCCGTGAACG

1921 GCCACGAGTT CGAGATCGAG GGCGAGGGCG AGGGCCGCCC CTACGAGGGC ACCCAGACCG

1981 CCAAGCTGAA GGTGACCAAG GGCGGCCCCC TGCCCTTCGC CTGGGACATC CTGTCCCCCC

2041 AGTTCCAGTA CGGCTCCAAG GTGTACGTGA AGCACCCCGC CGACATCCCC GACTACAAGA

2101 AGCTGTCCTT CCCCGAGGGC TTCAAGTGGG AGCGCGTGAT GAACTTCGAG GACGGCGGCG

2161 TGGTGACCGT GACCCAGGAC TCCTCCCTGC AGGACGGCTC CTTCATCTAC AAGGTGAAGT

2221 TCATCGGCGT GAACTTCCCC TCCGACGGCC CCGTAATGCA GAAGAAGACT ATGGGCTGGG

2281 AGGCCTCCAC CGAGCGCCTG TACCCCCGCG ACGGCGTGCT GAAGGGCGAG ATCCACAAGG

2341 CCCTGAAGCT GAAGGACGGC GGCCACTACC TGGTGGAGTT CAAGTCCATC TACATGGCCA

2401 AGAAGCCCGT GCAGCTGCCC GGCTACTACT ACGTGGACTC CAAGCTGGAC ATCACCTCCC

2461 ACAACGAGGA CTACACCATC GTGGAGCAGT ACGAGCGCGC CGAGGGCCGC CACCACCTGT

2521 TCCTGTAGAC GGCTGTTTAA ACCCGCTGAT CAGCCTCGAC TGTGCCTTCT AGTTGCCAGC

2581 CATCTGTTGT TTGCCCCTCC CCCGTGCCTT CCTTGACCCT GGAAGGTGCC ACTCCCACTG

2641 TCCTTTCCTA ATAAAATGAG GAAATTGCAT CGCATTGTCT GAGTAGGTGT CATTCTATTC

2701 TGGGGGGTGG GGTGGGGCAG GACAGCAAGG GGGAGGATTG GGAAGACAAT AGCAGGCATG

2761 CTGGGGATGC GGTGGGCTCT ATGGCTTCTG AGGCGGAAAG AACCAGCTGG GGCTCTAGGG
2821 GGTATCCCCA CGCGCCCTGT AGCGGCGCAT TAAGCGCGGC GGGTGTGGTG GTTACGCGCA
2881 GCGTGACCGC TACACTTGCC AGCGCCCTAG CGCCCGCTCC TTTCGCTTTC TTCCCTTCCT
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3181 TTGATTTATA AGGGATTTTG CCGATTTCGG CCTATTGGTT AAAAAATGAG CTGATTTAAC
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3361 TGGAAAGTCC CCAGGCTCCC CAGCAGGCAG AAGTATGCAA AGCATGCATC TCAATTAGTC
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3481 CCATTCTCCG CCCCATGGCT GACTAATTTT TTTTATTTAT GCAGAGGCCG AGGCCGCCTC
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3721 GCTATTCGGC TATGACTGGG CACAACAGAC AATCGGCTGC TCTGATGCCG CCGTGTTCCG
3781 GCTGTCAGCG CAGGGGCGCC CGGTTCTTTT TGTCAAGACC GACCTGTCCG GTGCCCTGAA
3841 TGAACTGCAG GACGAGGCAG CGCGGCTATC GTGGCTGGCC ACGACGGGCG TTCCTTGCGC
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4021 TGCAATGCGG CGGCTGCATA CGCTTGATCC GGCTACCTGC CCATTCGACC ACCAAGCGAA
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5221 CGCCCCCCTG ACGAGCATCA CAAAAATCGA CGCTCAAGTC AGAGGTGGCG AAACCCGACA
5281 GGACTATAAA GATACCAGGC GTTTCCCCCT GGAAGCTCCC TCGTGCGCTC TCCTGTTCCG
5341 ACCCTGCCGC TTACCGGATA CCTGTCCGCC TTTCTCCCTT CGGGAAGCGT GGCGCTTTCT
5401 CATAGCTCAC GCTGTAGGTA TCTCAGTTCG GTGTAGGTCG TTCGCTCCAA GCTGGGCTGT
5461 GTGCACGAAC CCCCCGTTCA GCCCGACCGC TGCGCCTTAT CCGGTAACTA TCGTCTTGAG
5521 TCCAACCCGG TAAGACACGA CTTATCGCCA CTGGCAGCAG CCACTGGTAA CAGGATTAGC
5581 AGAGCGAGGT ATGTAGGCGG TGCTACAGAG TTCTTGAAGT GGTGGCCTAA CTACGGCTAC

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5641 ACTAGAAGAA CAGTATTTGG TATCTGCGCT CTGCTGAAGC CAGTTACCTT CGGAAAAAGA
5701 GTTGGTAGCT CTTGATCCGG CAAACAAACC ACCGCTGGTA GCGGTTTTTT TGTTTGCAAG
5761 CAGCAGATTA CGCGCAGAAA AAAAGGATCT CAAGAAGATC CTTTGATCTT TTCTACGGGG
5821 TCTGACGCTC AGTGGAACGA AAACTCACGT TAAGGGATTT TGGTCATGAG ATTATCAAAA
5881 AGGATCTTCA CCTAGATCCT TTTAAATTAA AAATGAAGTT TTAAATCAAT CTAAAGTATA
5941 TATGAGTAAA CTTGGTCTGA CAGTTACCAA TGCTTAATCA GTGAGGCACC TATCTCAGCG
6001 ATCTGTCTAT TTCGTTCATC CATAGTTGCC TGACTCCCCG TCGTGTAGAT AACTACGATA
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6121 GCTCCAGATT TATCAGCAAT AAACCAGCCA GCCGGAAGGG CCGAGCGCAG AAGTGGTCCT
6181 GCAACTTTAT CCGCCTCCAT CCAGTCTATT AATTGTTGCC GGGAAGCTAG AGTAAGTAGT
6241 TCGCCAGTTA ATAGTTTGCG CAACGTTGTT GCCATTGCTA CAGGCATCGT GGTGTCACGC
6301 TCGTCGTTTG GTATGGCTTC ATTCAGCTCC GGTTCCCAAC GATCAAGGCG AGTTACATGA
6361 TCCCCCATGT TGTGCAAAAA AGCGGTTAGC TCCTTCGGTC CTCCGATCGT TGTCAGAAGT
6421 AAGTTGGCCG CAGTGTTATC ACTCATGGTT ATGGCAGCAC TGCATAATTC TCTTACTGTC
6481 ATGCCATCCG TAAGATGCTT TTCTGTGACT GGTGAGTACT CAACCAAGTC ATTCTGAGAA
6541 TAGTGTATGC GGCGACCGAG TTGCTCTTGC CCGGCGTCAA TACGGGATAA TACCGCGCCA
6601 CATAGCAGAA CTTTAAAAGT GCTCATCATT GGAAAACGTT CTTCGGGGCG AAAACTCTCA
6661 AGGATCTTAC CGCTGTTGAG ATCCAGTTCG ATGTAACCCA CTCGTGCACC CAACTGATCT
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6781 GCAAAAAAGG GAATAAGGGC GACACGGAAA TGTTGAATAC TCATACTCTT CCTTTTTCAA
6841 TATTATTGAA GCATTTATCA GGGTTATTGT CTCATGAGCG GATACATATT TGAATGTATT
6901 TAGAAAAATA AACAAATAGG GGTTCCGCGC ACATTTCCCC GAAAAGTGCC ACCTGACGTC
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32..159	4xJRE-IL6
32..57	JRE-IL6 Response Element #1
66..91	JRE-IL6 Response Element #2
100..125	JRE-IL6 Response Element #3
134..159	JRE-IL6 Response Element #4
177..201	Minimal Promoter – YB_TATA
249..806	Gaussia Luciferase
851..1075	bGHpA
1175..1732	CMV
1851..2528	dsRed Express
2560..2784	bGHpA
2830..3258	f1 ori
3263..3633	SV40 Early Promoter
3668..4462	NeoR
4636..4767	SV40 PA
5820..5149	pUC ori
6824..5964	AmpR
6923..6825	Bla Promoter