

Appendix for:

Characterizing chemical signaling between engineered "microbial sentinels" in porous microplates

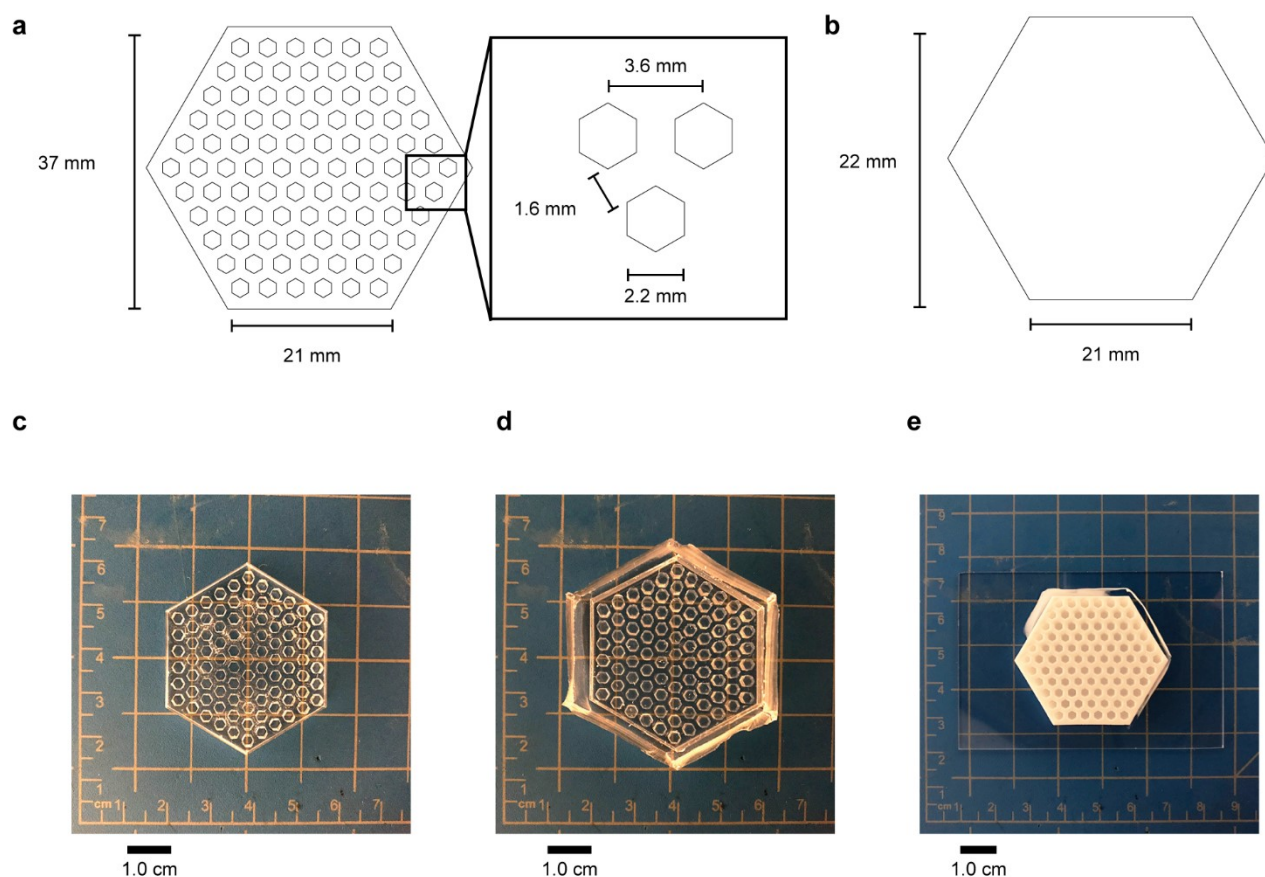
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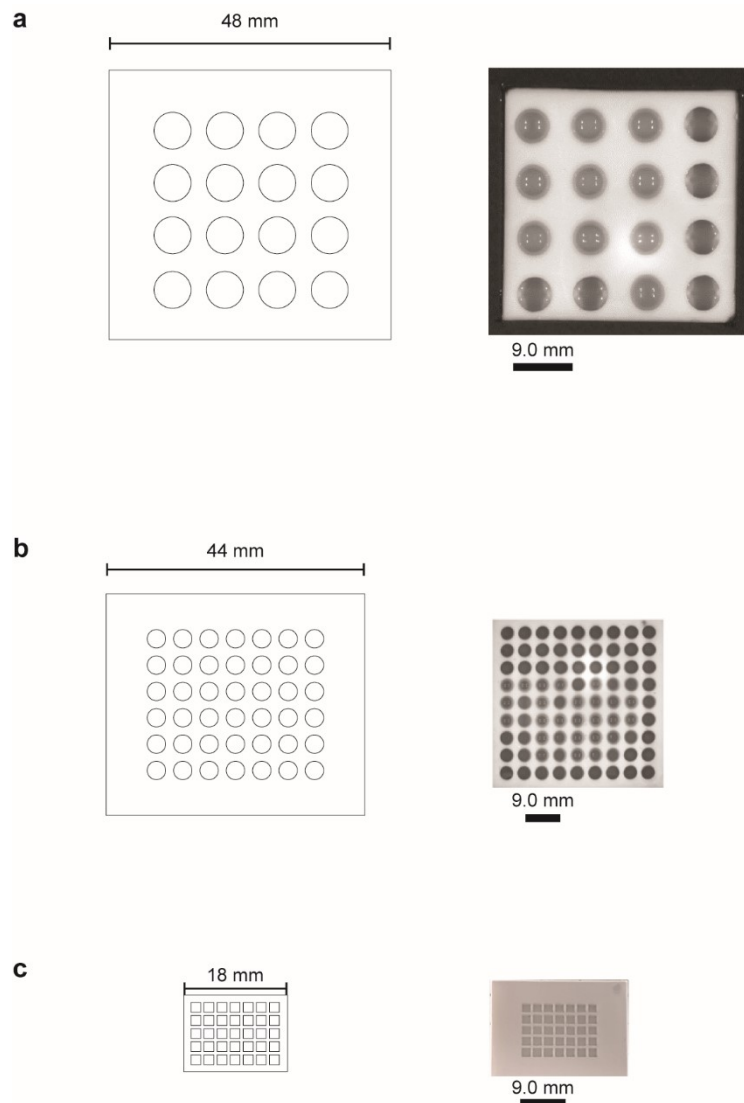
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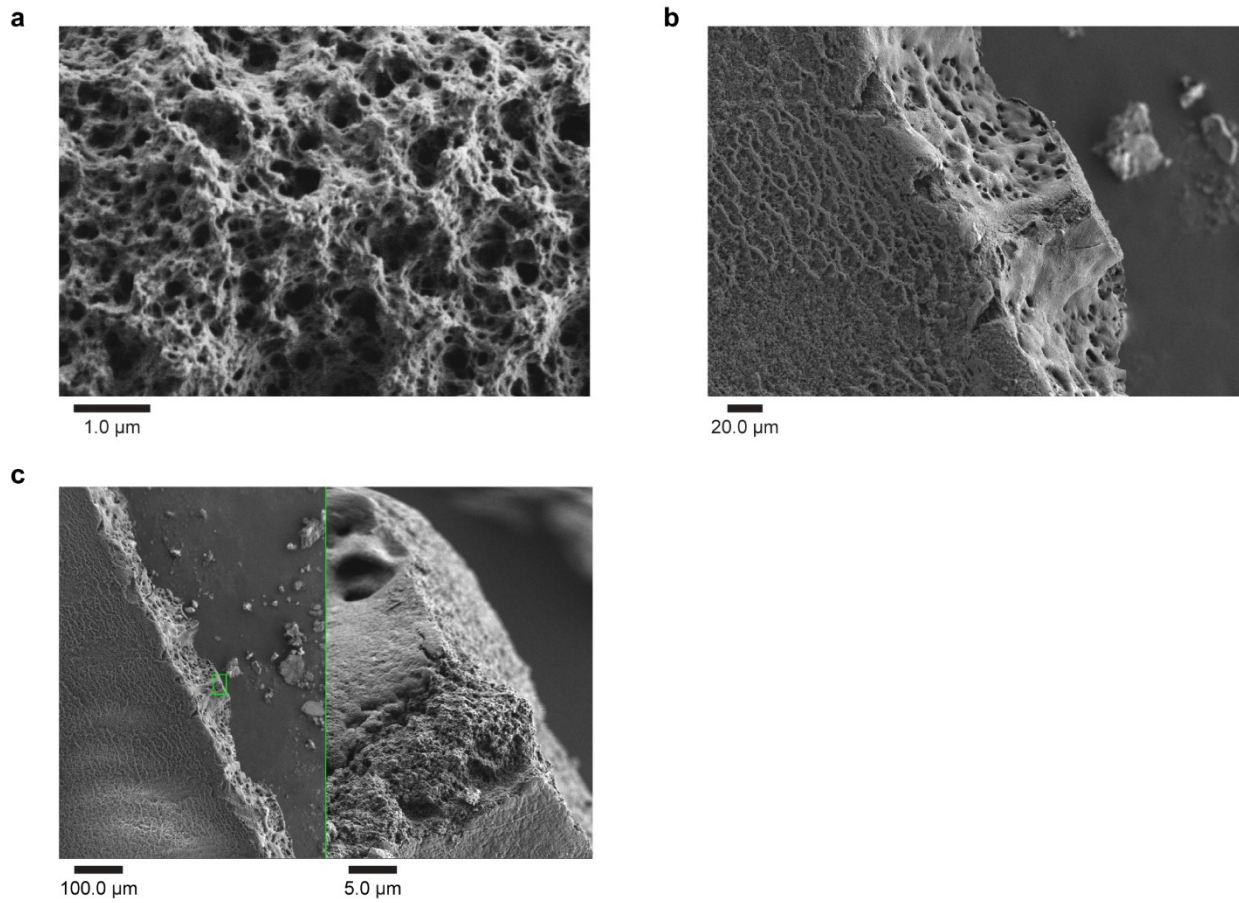
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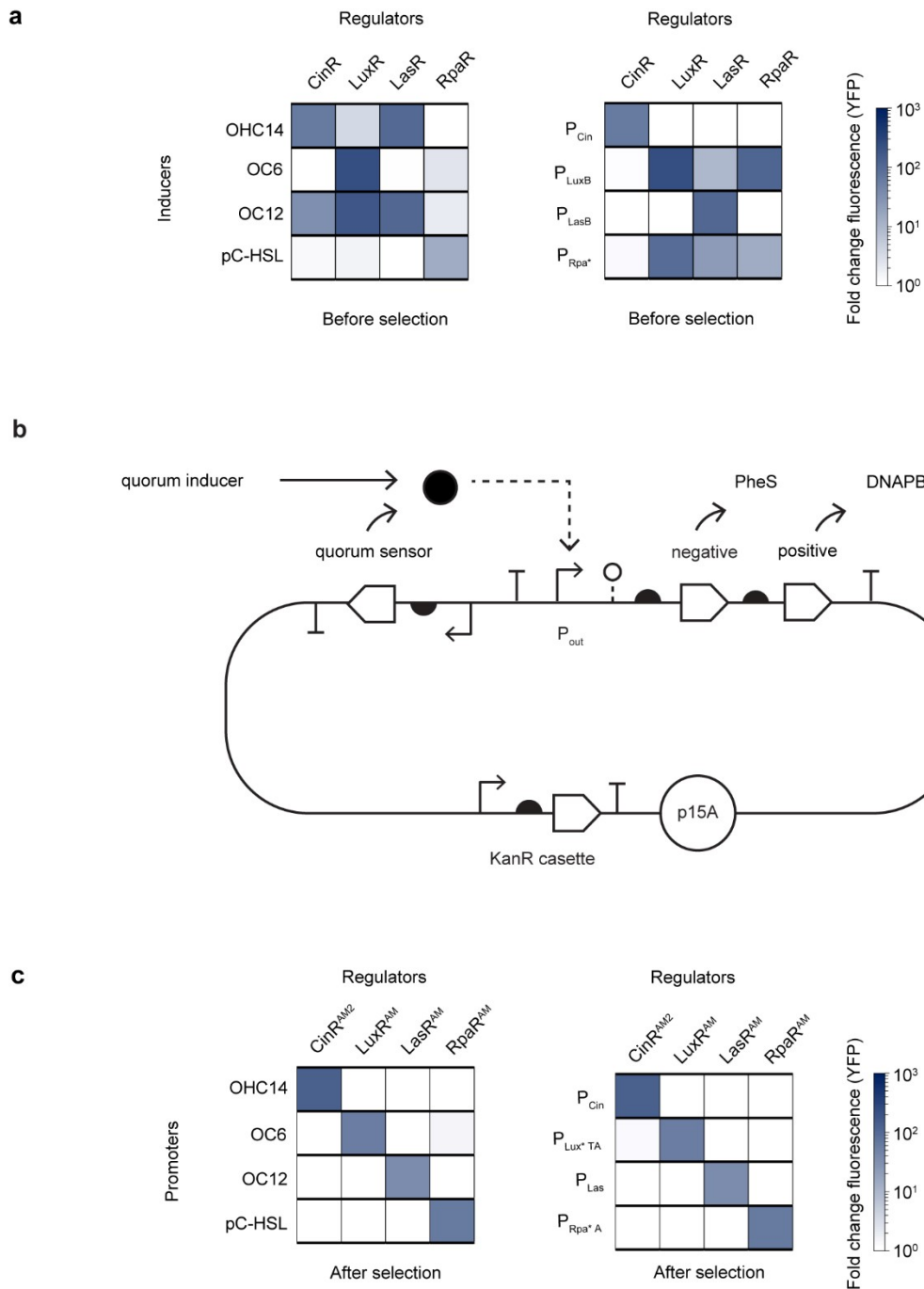
Appendix Figure S1: Hexagonal microplate fabrication. (a) The dimensions of the hexagonal plate wells are shown overlaid on a 1x scaled vector image template used for laser cutting the acrylic mold. Inset show the well center-to-center distance, well diameter, and the wall thickness between wells. (b) A vector image template of the hexagonal plate bottom used for lased cutting an acrylic mold. (c) Photograph of the final acrylic mold. (d) Photograph of the PDMS master. (e) The final cross-linked microplate affixed to an activated 2" x 3" glass slide. Scale bar dimensions are noted in the figure.



Appendix Figure S2: Alternate microplate designs. Vector image templates and photographs of corresponding microplates with the dimensions of a 96-well **(a)**, 384-well **(b)**, and 1536-well standard plate **(c)**. Scale bar dimensions are noted in the figure.

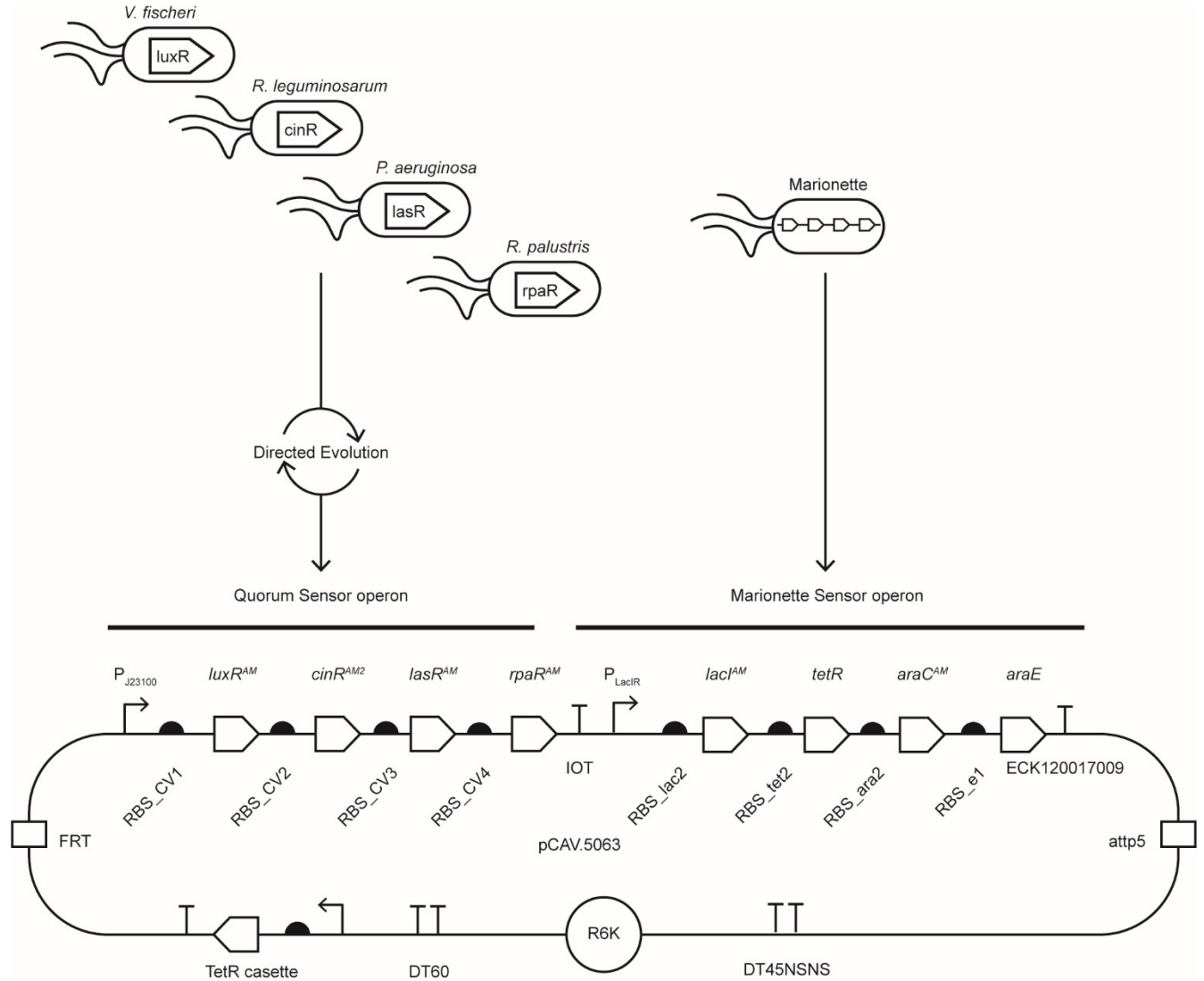


Appendix Figure S3: Scanning electron micrographs. Magnification: 116 270 x magnification **(a)**; 372 x magnification **(b)**; 100 x magnification (left), 2 000x (right) **(c)**.

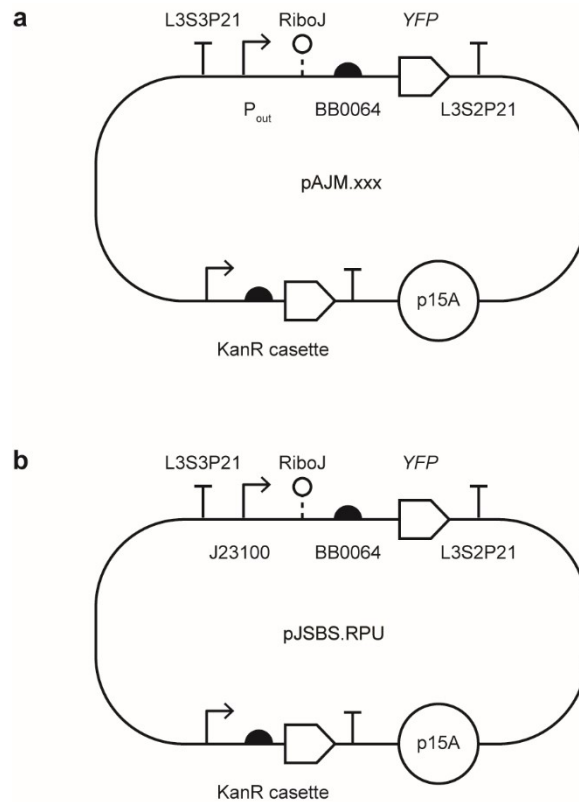


Appendix Figure S4: Quorum sensor evolution. (a) Chemical (left) and promoter (right) cross reactivity of *cinR*, *luxR*, *lasR*, and *rpaR* before evolution. (b) Selection plasmid map. (c) Chemical (left) and promoter (right) cross reactivity of the final sensors after evolution, denoted as *cinR*^{AM}, *luxR*^{AM}, *lasR*^{AM}, and *rpaR*^{AM}. Fold change equals the fluorescence signal of a strain bearing an output plasmid (Appendix

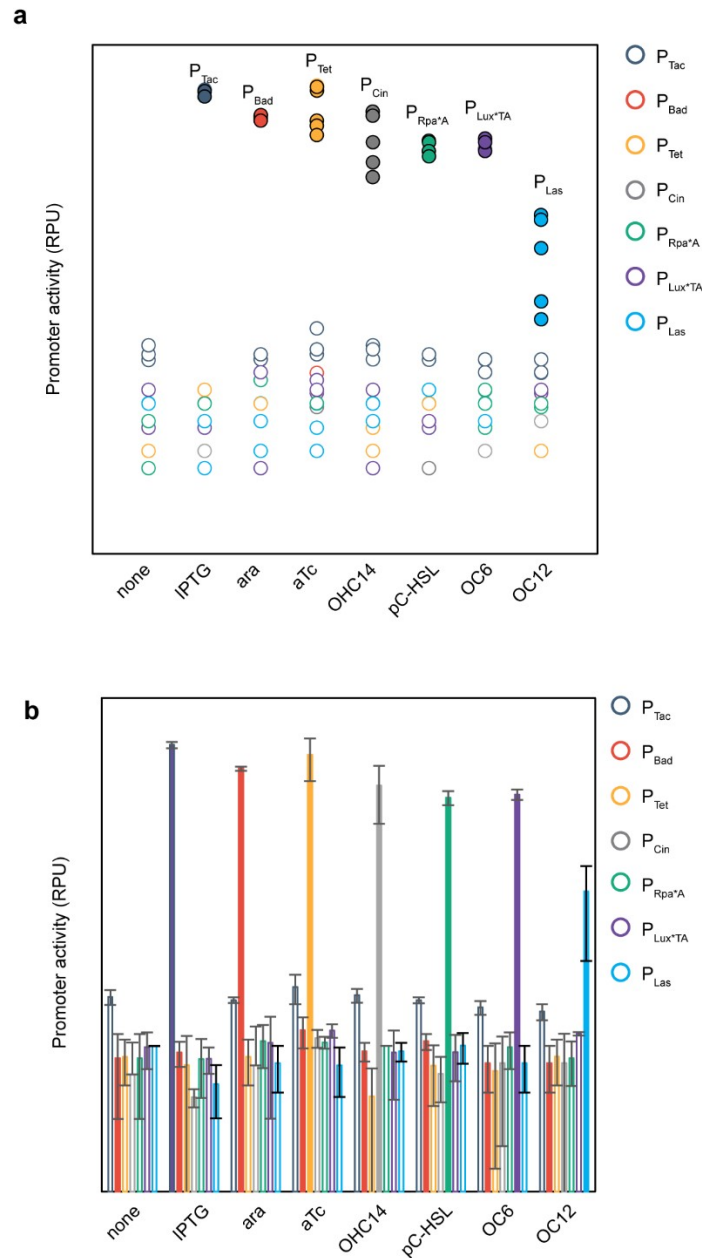
Figure 6) with YFP under the control of P_{out} cultured with its cognate inducer divided by the fluorescence signal of that strain with no inducer present.



Appendix Figure S5: Sensor array construction and plasmid map. The evolved quorum sensors $LuxR^{AM}$, $CinR^{AM2}$, $LasR^{AM}$, and $RpaR^{AM}$ were cloned from their respective plasmids into a single operon controlled by the constitutive promoter J23100 and rationally designed synthetic RBS sequences. The sensor block $LacI^{AM}$, $TetR^{AM}$, and $AraC^{AM}$ were cloned directly from the Marionette-wild strain and remained under control of the constitutive promoter LacI and rationally designed synthetic RBS sequences. The entire sensor block was cloned onto an R6K genomic integration plasmid with a tetracycline resistance cassette.

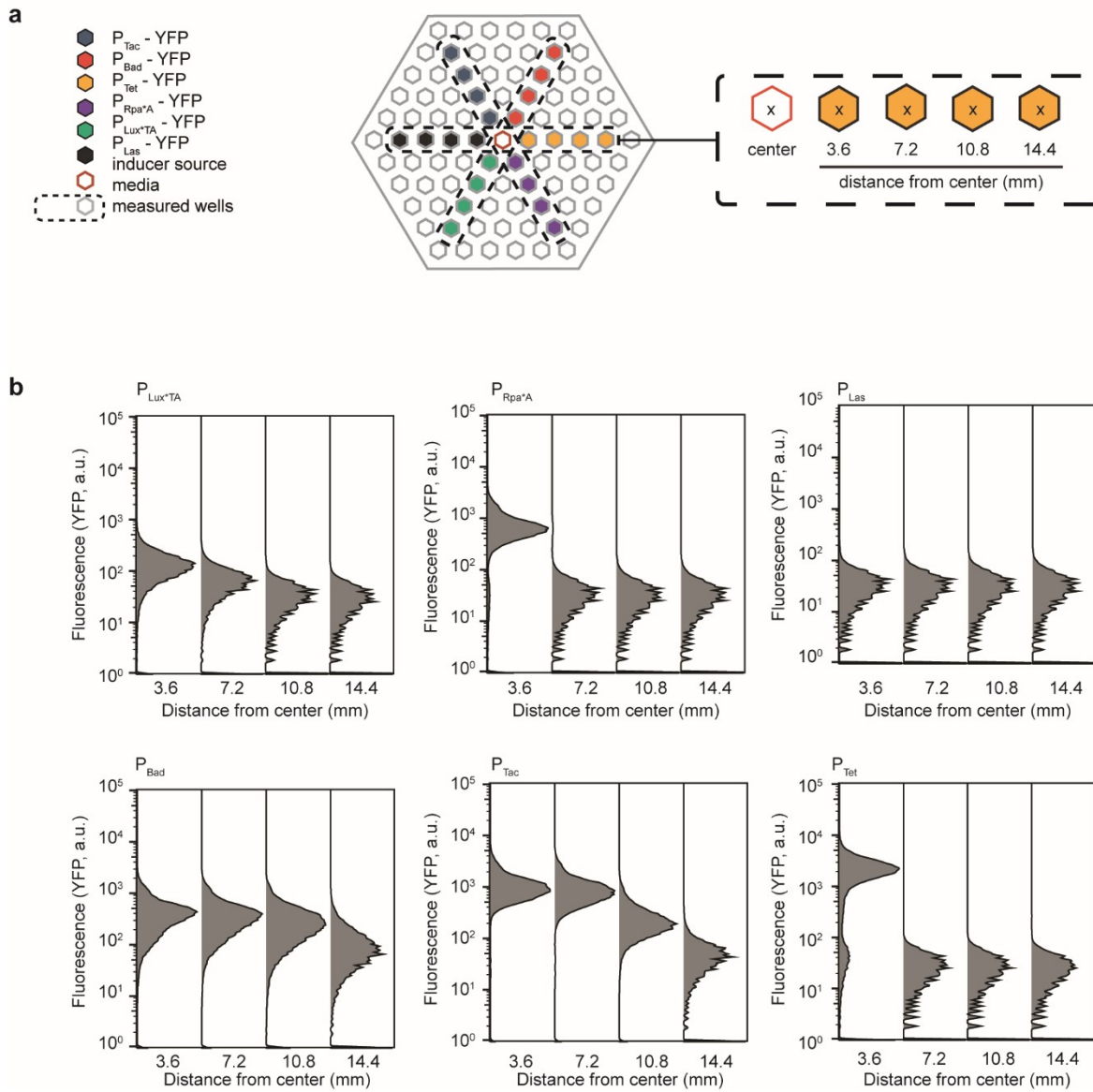


Appendix Figure S6: Output and RPU standard plasmid maps. (a) Output plasmids were used for dose-response characterization and for inducer gradient detection within the porous microplate. All outputs are assembled onto the same architecture and the promoter P_{out} represents a single output promoter that corresponds with each of the sensors in the Sensor strain. Sequences of each P_{out} can be found in Supplementary Table 1. The complete sequence of the following plasmids have been published prior: pAJM.715 (P_{Tac}), pAJM.716 (P_{Bad}), pAJM.717 (P_{Tet}) (Meyer *et al*, 2019). The complete sequences of the following plasmids can be found in Supplementary Table 2: pAJM.944 (P_{Cin}); pAJM.947 (P_{Rpa}); pAJM.1246 (p_{Lux}); pAJM.1349 (P_{Las}); pAJM.947 (P_{Rpa}). **(b)** The RPU plasmid was used for normalizing the YFP fluorescent outputs into standardized units, and the full sequences has been previously published (Meyer *et al*, 2019).



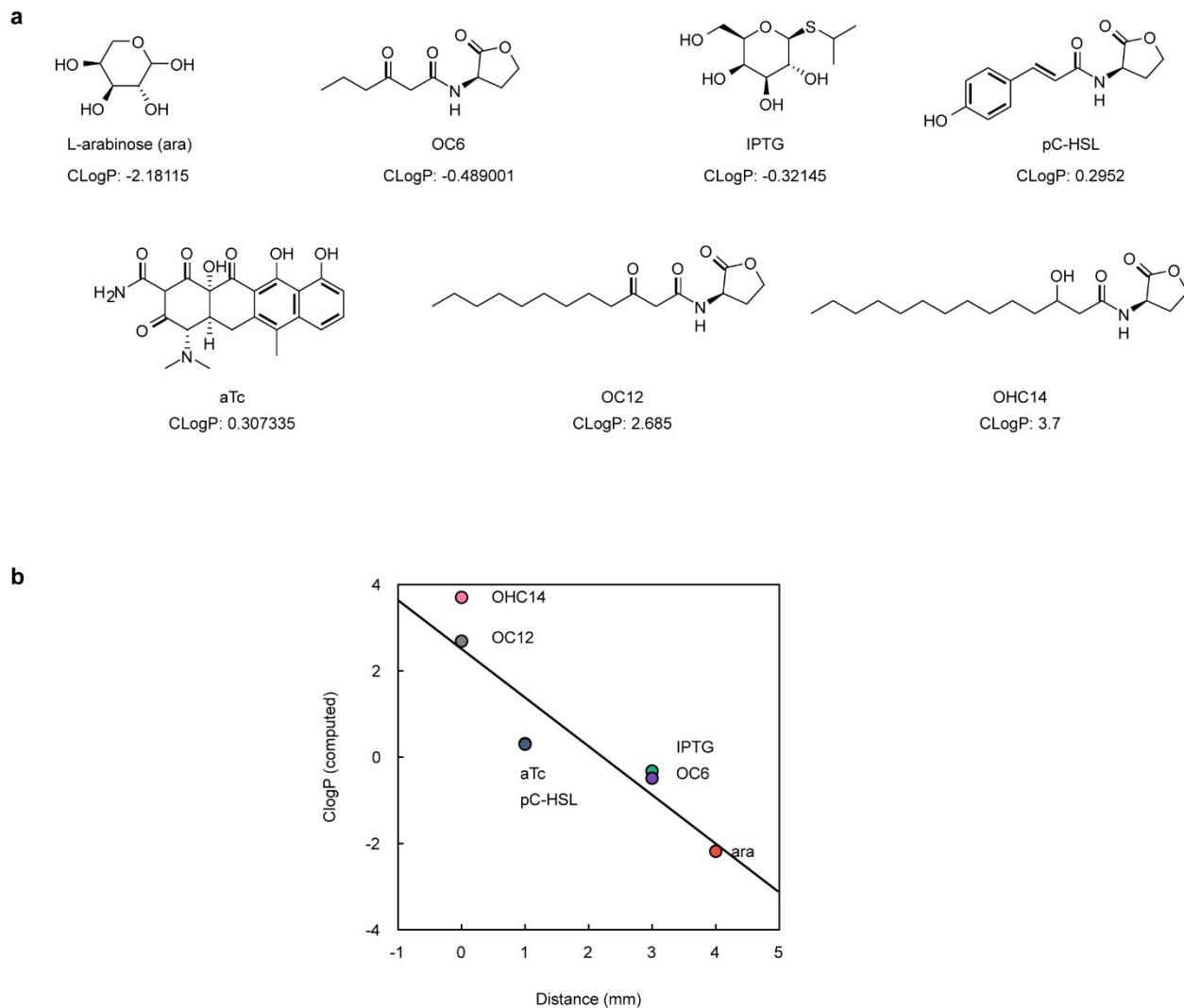
Appendix Figure S7: Sensor orthogonality screen. Each output strain was cultured with each of the seven small molecule inducers. **(a)** All data points are plotted with inducer on the X axis and promoter activity (RPU) on the Y axis for each combination of output strain and inducer. The open circles indicate data for mis-matched output strain – inducer pairs. The labeled closed circles indicate data for the proper output strain – inducer pair. At least three data points were taken for each condition. Data that were negative (and suggests no signal was present) after normalization into RPU units were not included. **(b)** The compiled data from part **(a)** as the average signal for each output strain – inducer pair.

Data bars are the average of at least three independent culture wells of each output-inducer pair tested on different days. The error bars represent the standard deviation. Data that were negative (and suggests no signal was present) after normalization into RPU units were not included.

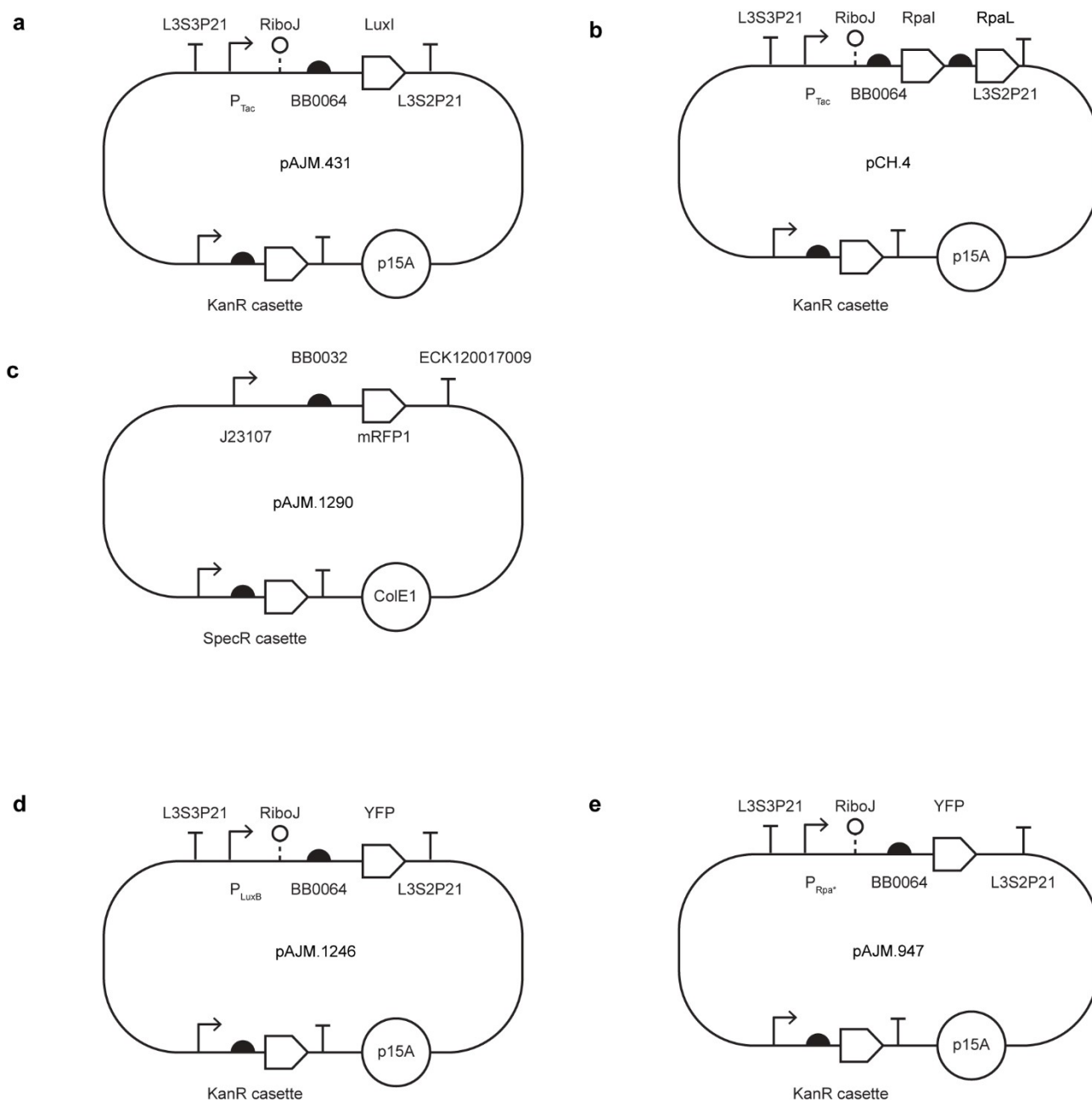


Appendix Figure S8: Representative inducer diffusion cytometry data. (a) Schematic depiction of the porous microplate setup for inducer diffusion experiments. The center well was loaded with an inducer cocktail (red open hexagon; (20.0 mM IPTG, 0.0004 mM aTc, 160.0 mM L-arabinose, 0.1 mM OC6, 0.1 mM pC-HSL, 0.4 mM OC12). The neighboring wells were loaded with output strains as pictured (filled colored hexagons, clockwise from the top left: pAJM.715 (P_{Tac}); pAJM.716 (P_{Bad}); pAJM.717 (P_{Tet}); pAJM.947 (P_{RpaA}); pAJM.1246 (P_{Lux*TA}); pAJM.1349 (P_{Las}). The output strain pAJM.944 (P_{Cin}) was tested separately and yielded no signal (data not shown). The remaining wells contained growth medium (open black hexagons). The inset illustrates the sampled wells and their respective distance from the center source well. **(b)** Single representative cytometry data set after a five hour incubation time. The median

fluorescence signal was recorded and normalized for data analysis, and the experiment was repeated three times on different days.



Appendix Figure S9: Inducer molecule ClogP analysis. (a) Chemical structures of the inducers tested. Annotated ClogP values were calculated using ChemDraw Professional (Perkin Elmer). **(b)** A plot of calculated ClogP as a function of distance traveled through the microplate for each inducer. The data were fit to a linear equation using Microsoft Excel; $y = -1.1x + 2.5$; $R^2 = 0.82$.



Appendix Figure S10: Quorum sender and receiver plasmid maps. (a) The OC6 quorum sender expresses the synthase *luxI* under control of the inducible promoter P_{Tac} . **(b)** The pC-HSL quorum sender expresses the synthase *rpaI* and the transporter *rpaL* under control of the inducible promoter P_{Tac} . **(c)** Sender strains were also transformed with a plasmid expressing red fluorescent protein (mRFP1) under control of the constitutive promoter J23107. **(d)** P_{LuxB} output strain plasmid. **(e)** P_{Rpa^*} output plasmid. Sequences of individual parts can be found in Supplementary Table 1.

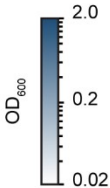
a

Carbenicillin										
Distance	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Student's T-Test
3.6	0.02	0.04	0.03	0.17	0.10	0.19	0.01	0.07	0.03	1.52E-06
7.2	0.00	0.01	0.00	0.08	0.09	0.17	0.04	0.04	0.06	2.43E-08
10.8	0.06	0.02	0.01	0.10	0.10	0.18	0.04	0.06	0.12	1.05E-06
14.4	0.41	0.89	0.69	0.97	1.03	0.79	0.63	0.67	0.33	1.35E-01

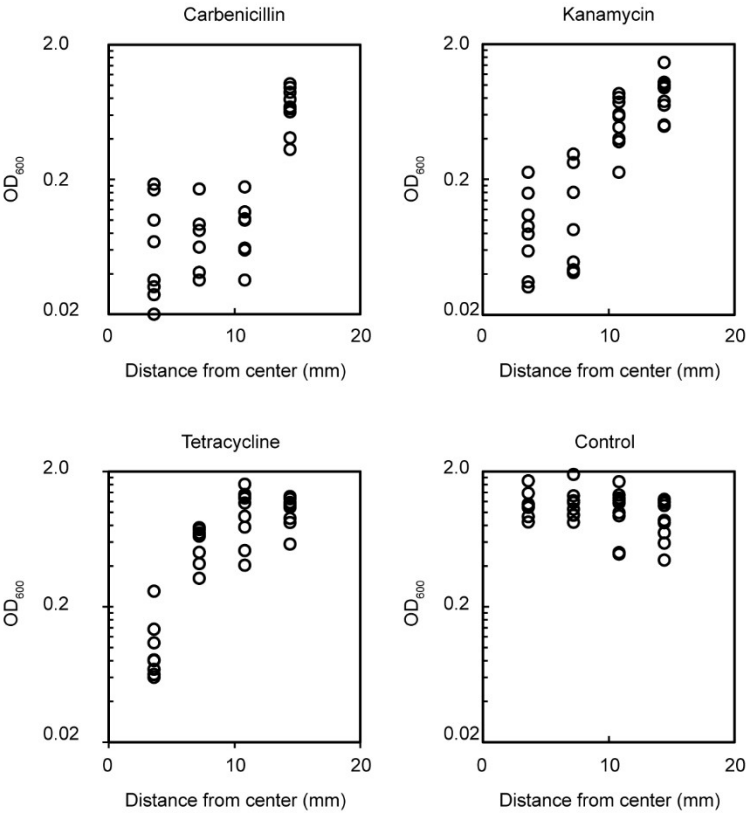
Kanamycin										
Distance	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	
3.6	0.06	0.16	0.23	0.09	0.08	0.11	0.04	0.00	0.03	1.81E-06
7.2	0.04	0.05	0.04	0.16	0.31	0.27	0.01	0.09	0.04	8.62E-08
10.8	0.86	0.49	0.61	0.59	0.81	0.74	0.38	0.40	0.23	3.66E-03
14.4	1.46	0.98	1.00	0.71	1.04	0.95	0.75	0.49	0.50	8.33E-01

Tetracycline										
Distance	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	
3.6	0.11	0.26	0.14	0.06	0.08	0.06	0.07	0.06	0.08	2.07E-06
7.2	0.66	0.74	0.77	0.70	0.51	0.42	0.32	0.68	0.68	3.24E-04
10.8	1.17	1.35	1.27	1.30	1.61	0.77	0.41	0.52	0.93	8.78E-01
14.4	1.30	1.18	1.26	1.25	1.13	0.84	0.58	1.08	0.90	2.48E-01

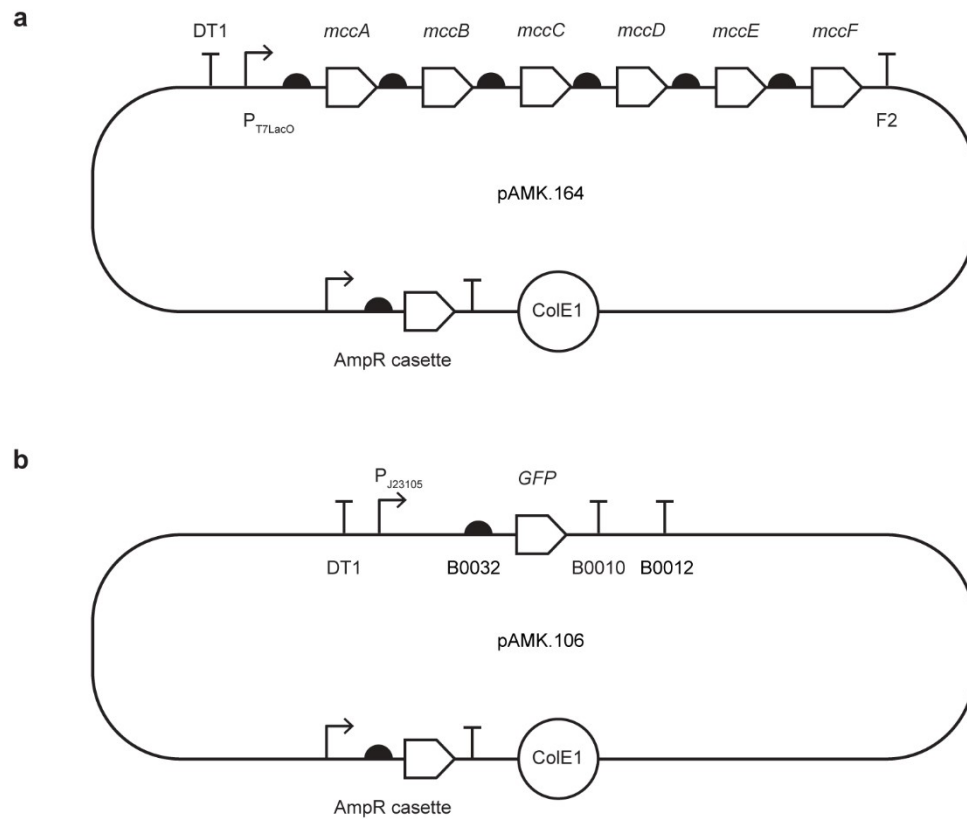
Control										
Distance	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	
3.6	1.38	1.71	2.45	1.10	1.13	0.93	0.84	1.09	1.15	
7.2	1.05	1.90	1.22	0.95	0.95	0.84	0.95	1.32	1.18	
10.8	0.94	1.68	1.34	0.49	0.99	0.50	1.27	1.17	1.22	
14.4	0.44	1.17	1.24	0.70	1.12	0.59	0.87	1.20	0.83	



b



Appendix Figure S11: Antibiotic diffusion data. (a) Optical density reads from the antibiotic diffusion assay. Samples were collected from four distance from the center well. Three samples were collected per device, and three devices were run on different days, resulting in nine combined samples per condition. The control well contained no antibiotics in the center well. Data arrays from each tested microplate were compared to the data array from the control plate using an unpaired two-tailed Student's T-Test, and the values are noted in the figure. **(b)** A plot of optical density versus distance from the center of the center well for each condition.

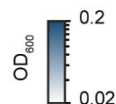


Appendix Figure S12: Microcin producer plasmid map. The *mcc7* cluster was cloned into a p15A plasmid under the control of the inducible promoter P_{T7LacO} . Sequences of individual parts can be found in Supplementary Table 1.

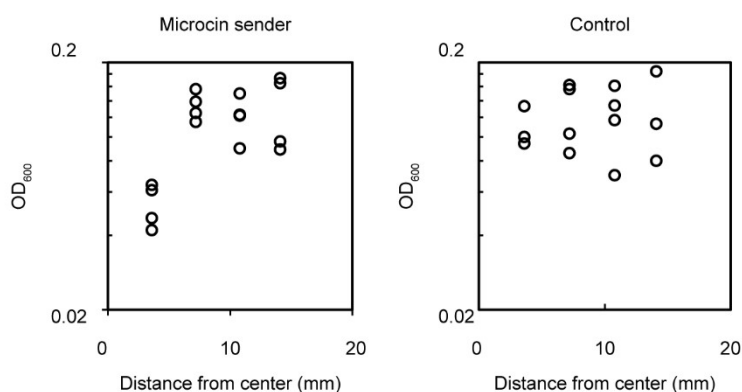
a

distance	Rep1	Rep2	Rep3	Rep4	Student's T-Test
3.6	0.05	0.06	0.04	0.06	0.02
7.2	0.14	0.16	0.13	0.12	0.75
10.8	0.15	0.12	0.12	0.09	0.97
14.1	0.17	0.17	0.10	0.09	0.69

Control distance	Rep 1	Rep 2	Rep 3	Rep 4
3.6	0.13	0.20	0.10	0.09
7.2	0.16	0.16	0.10	0.09
10.8	0.13	0.16	0.12	0.07
14.1	0.18	0.21	0.11	0.08



b



Appendix Figure S13: Microcin producer diffusion data. **(a)** Optical density reads from the microcin sender diffusion assay. Samples were collected from four distance from the center well. Four samples were collected per device, resulting in four total samples per condition. The control well contained no microcin sender in the center well. Data arrays from each tested microplate were compared to the data array from the control plate using an unpaired two-tailed Student's T-Test, and the values are noted in the figure. **(b)** A plot of optical density versus distance from the center of the center well for each condition.

Appendix Table S1: Genetic Parts List	
Name	Sequence
Promoters	
P _{Tac}	TGTTGACAATTAATCATCGGCTCGTATAATGTGTGGAATTGTGAGCGCTCACAATT
P _{Bad}	AGAAACCAATTGTCCATATTGCATCAGACATTGCGTCACTGCGTCTTTTACTGGCTCTTCTCGCTAACCAAACCGGTAACCCCGCTTATTAAGCATTCTGTAACAAAGCGGGACCAAGCCATGACAAAAACGCGTAACAAAGTGCTATAATCACGGCAGAAAAGTCCACATTGATTATTTGCACGGCGTCACACTTTGCTATGCCATAGCATTTTATCCATAAGATTAGCGGATCCCTACCTGAGCTTTTTATCGCAACTCTCTACTGTTTCTCCATACCCG
P _{Tet}	TCCTATCAGTGATAGAGATTGACATCCCTATCAGTGATAGAGATACTGAGCAC
P _{Cin}	CCCTTTGTGCGTCCAAACGGACGACGCGCTCTAAAGCGGGTCGCGATCTTTCAGATTCGCTCCTCGCGCTTTCAGTCTTTGTTTGGCGCATGTCGTTATCGCAAAACCGGTGCACACTTTTGCAGCATGCTCTGATCCCCCTCATCTGGGGGGCCTATCTGAGGGAATTTCCGATCCGGCTCGCTGAACCATTTCTGCTTTCCACGAACCTTGAAAACGCT
P _{rpa*}	ACCTGTCCGATCGGACAGTATTACGCAAGAAAATGGTTTGTACTTTTCAATAAAA
P _{Rpa*A}	ACCTGTCCGATCGGACAATATTACGCAAGAAAATGGTTTGTACTTTTCAATAAAA
P _{LuxB}	ACCTGTAGGATCGTACAGTTTACGCAAGAAAATGGTTTGTACTTTTCAATAAAA
P _{LuxTA}	ACCTGTAGGATCTTACAAGTTTACGCAAGAAAATGGTTTGTACTTTTCAATAAAA
P _{LasB}	AAC TAGCAAAATGAGATAGATTTTCGGTGAAACCGGACCCCTTGCTAGGCTCGAAGAA
P _{J23100}	TTGACGGCTAGCTCAGTCTAGGTACAGTGCTAGC
P _{LacIR}	GCGGCGGCCATCGAATGGTGAAAAACCTTTGCGGCTATGGCATGATAGCGCCC
P _{J23107}	TTTACGGCTAGCTCAGCCCTAGGTATTATGCTAGC
P _{T7LacO}	TAATACGACTCACTATAGGGGAATTGTGAGCGGATAACAATT
Ribosome Binding Sites	
RBS_luxr1	GCGAAGCAACTAAGGAGAATCTAT
RBS_cinr1	CCGCAGCACCTAAGGAGGCTAATTC
RBS_lasr1	TAAGGGCAGGTAAGGAGGTATTTTT
RBS_rpar1	TGGCAACAATAAGGAGGTAGTTTCT
RBS_lac1	GGAAGAGAGTCAATTCATGGAGGTGAAT
RBS_Tet2	TAATCAAGGTGCGAAAAA
RBS_ara2	TTCAAGGAGGTAAT
RBS_e1	ATTAAAGAGGAGCGATTAAAGC
RBS_rpai	TGGTTCCAAAGCCAGATACTAAGGAGGTCCCT
RBS_rpal	AAGGAGCGCTCTCCAGCCC
RBS_luxi	ATAAGAGCAAGATAATAAGGAACACTTCTA
RBS_mccA	ATTCCACTTGTGAATTAATCAGAGTAATAGGAGGTCGAC
RBS_mccB	CAATGCATTCTCGGAGGTTTATTT
BB0064	AAAGAGGGGAAA
BB0032	TCACACAGGAAAG
Ribozymes	
RiboJ	AGCTGTACCGGATGTGCTTCCGGTCTGATGAGTCCGTGAGGACGAAACAGCCTCTACAAATAATTTTGTTTAA
Genes	
<i>luxR^{AM}</i>	ATGAAAAACATAAATGCCGACGACACATACAGAATAATTAATAAAATTAAGCTTTTAGAAGCAATAATGATATTAATCAATGCTTATCTGATATGACTAA AATGGTACATTGTGAATATTATTTACTCGCGATCATTTATCCTCATTTCTATGGTTAAATCTGATATTTCAATCCTAGATAATTACCCATAAAAAATGGAGGC AATATTATGATGACGCTAATTTAATAAAATATGATCCTATAGTAGATTATTTCAACTCCAATCATTACCAATTAATTGGAATATATTTGAAAACAATGCT GTAAATAAAAAATCTCCAATGTAATTAAAGAAGCGAAAAACATCAGGTCTTATCACTGGGTTTAGTTTCCCTATTTCATATGGCTAACCAATGGCTTCGGAAT GCTTAGTTTTCATATTCAGAAAAAGACAATATATAGATAGTTTATTTTACATGCGTGTATGAACATACCATTAAATTGTTCCCTCTCTAGTTGATAATT ATCGAAAAATAAATATAGCAATAATAAATCAAAACACGATTTAACCAAAAGAGAAAAAGAATGTTTAGCGTGGGCATGCGAAGGAAAAAGCTCTTGGGAT ATTTCAAAATATAGGATGCAGTGAGCGTACTGTCACTTTCCATTTAACCAATGCGCAAAAGAACTCAATACAAACAAACCGCTGCCAAAGTATTCTCAA AGCAATTTTAAACAGGACAAATTGATTGCCCATACTTTAAAAATTCGATAA
<i>cinR^{AM2}</i>	ATGATTGAGAATACCTATAGCGAAAAGTTCGAGTCCCGGTTGCAACAGATCAAAGCGGCGGCCAACGTGGATGCCGCCATCCGTATTCTCCAGGCGGAATA TAACTCTGATTTTCGTACCTACCATCTCGCCGACAGACAATCGCGAGCAAGATCGATTGCGCCTTCGTGCGCACCACCTATCCGGATGCTGGGTTTCCCGTT ACCTCCTCAACTGCTATGTGAAGGTCGATCCGATCATCAAGCAGGGCTTCGAACGCCAGCTGCCCTTCGACTGGAGCGAGGTGGAACCGACGCCGAGGCC TATGCCATGCTGGTCGACGCCGCAAAACACGGCATCGATGACAAATGGCTACTCCATCCCCGTCGCGGACAAGGCGCAGCGCCGCGCCCTGCTGTCGCTGAA TGCCCATATACCGGCCGACGAATGGACCGAGCTCGTGCGCGCTACCGCAACGAGTGGATCGAGATCGCCCATCTGATCCACCGCAAGGCCGTATATGAGC TGCATGGCGAAAACGATCCGGTGCCGGCATTTGTCGCCGCGGAGATCGAGTGTGCACTGGACCGCCCTCGGCAAGGATTACAGGATATTTCCGGTCACTC CTGGGCATATCAGAGCATACACACGCGATTACCTGAAAAACGCCCGCTTCAGGCTCGGTCGACCACGATCTCGGCGCCGCGTCGCGGGCTGTTCAATT GTGCATCATCAATCCCTATAGGATCCGCATGACGCGACGTAATTGGTAATAG

<i>lasR^{AM}</i>	ATGGCCTTGGTTGACGGTTTTCTTGAGCTGGAACGCTCAAGTGGAAAAATTGGAGTTGAGCGCCATCCTGCAGAAGATGGCGAGCGACCTCGGATTCTCGAA GATCCTGTTCCGCTGTGGCTTAAGGACGCCAGGACTACGAGAACGCCCTTCACTCGTCAGCAACTACCCGGCCGCTGGCGGAGCATTACGACCGAACTG GCTACGCGCGGGTCGACCCGACGGTCACTGCTACCCAGAGCGTACTGCCGATTTTCTGGGAACCGCCCATCTACAGACCGGAAAGCAGCAGAGTTTC TTCGAGGAAGCCTTGCGCGCTGGCTGGTGATGGACTGACCATGCGCGTGCATGGTGCTCGCGGCGAACTCGGCGCGCTGAGCCTCAGCGTGGGAAGCGGA AAACCGGGCCGAGGCCAACCGTTTCATGGAGTCGGCTTGGCGACCCCTGGGATGCTCAAGGACTACGCACTGCAGAGCGGGTGTGGGAATGGCCCTCGAAG ATCCGCTACGAAACCGGTGGTTCTGACCAGCCGAGAGAAGGAAGTGTACAGTGGTGCAGCATCGGCAAGACCAGCTGGGAGATATCCGTTATCTCGCAAC TGCTCGAAGCCAATGTGAACCTCCATATGGGAATATTCGGCGGAAGTTTCGGTGTGACCTCCGCGCGTAGCGGCATATATGGCGCTTAATTTGGGCTCT TATTACTCTCTGATAA
<i>rpaR^{AM}</i>	ATGATTGTGGGTGAAGATCAGCTGTGGGGTCGTCGTACACTGGAATTTGTTGATAGCGTTGAACGTCTGGAAGCACCGGCCTGATTAGCCGTTTTGAAAG CCTGATTGCAAGCTCTGGTTTTACCGCTATATCATGGCAGCTCTGCCGAGCCGTAATGCCGCTCTGCCGAACTGACCTGGCAAAATGGTTGGCCTCGTG ATTGGTTTGATCTGTATGTTAGCGAAAACTTTAGCGCAGTTGATCCGGTTCGCGGTTATGGTGCAACCACCTGTTCACTCCGTTTGGTGGAGTGATGCACCG TATGATCGTGACCGTGATCAGGCAGACATCTGTGTATGACCCGTGCAGCAGAATTTGGTCTGGTTGAAGGTTATTGTATCCGCTGCATTACGATGATGG TAGCGCAGCAATTAGTATGGCAGGTGAAGATCCTGATCTGAGTCCGCGAGCCGTTGGTGTAAATGCAGCTGGTTAGCATTTATGCACATAGCCGCTCTCGGTG TACTGAGCCGTCGGAACCGGATTCGTGTAATCGTCTGACACCCGCGTGAATGTGAAATTCGAGTGGGCAGCACAGGGTAAAAACCGCATGGGAAATTAGC GTTATTCTGTGATTATCCGACGACCGCTTAAATTTCACTGATTGAAGCAGCAGCTAACTGGATGCAGCAAAATCGTACCAGCAGGTTGCAAAAGCACT GACACTGGGTCTGATTCTGCTCTGATAA
<i>lacI^{AM}</i>	ATGAAACCACTAACGTTATACGATCTCGCAGAGTATGCCGGTGTCTCTTATATGACCGTTTCCCGCGTGGTGAACAGGCCAGCCACGTTTCTGCGAAAAAC CGGGGAAAAAGTGAAGCGGCGATGGTGAGCTGAATTACATTTCCCAACCGCGTGGGCACAACAACTGGCGGGCAAAACAGTCGTTGCTGATTGGCGTTGCCA CCTCCAGTCTGGCCCTGCAGCGCCGCTCGCAAAATTTGCGGGCGATTAAATCTCGCGCGATCAACTGGGTGCCAGGTTGGTGTGTCAGTAGAAGCA ACGGCGCTCGAAGCCTGTAAAGCGGCGGTGCACAACTCTCTCGCGCAACCGCTCAGTGGGCTGATCAATTAACATATCCGCTGAGTGACCAAGGATGCCATTGTC TGTCGAAGCTGCCTGCATAATGTTCCGCGCTAATTTCTTGATGTCTCTGACGACGACCACTCAACAGTATTTATTTCCATGCCATGAGGACGGTACGCGAC TGGCGGTGAGCATCTGGTGCATTTGGGTCAACGAGAAATCGCGCTGTAGCGGGCCCATTAAGTTCTGTCTCGCGCGCTCTGCGTCTGGGTGCTGGCAT AAATATCTCACTCGCAATCAAATTCAGCCGATAGCGGAACGGGAAGGCCACTGGAGTGCCATGTCCGGTTTTCAACAACCATGCAAAATGCTGAATGAGGG CATCGTTCCCACTGCGATGCTGGTTGCCAACGATCAGATGGCGCTGGGCGCAATGCCGCCATTAACCGAGTCCGGGCTGCGCGTTGGTGCGGATATCTCGG TAGTGGGATACGAGATACCGAAGATAGCTCATGTTATATCCCGCGTTAAACCACCATCAAACAGGATTTTCGCTGTGGGGCAACCCAGCGTGGACCGC TTGCTGCAACTCTCTCAGGGCCAGCGGTGAAGGGCAATCAGCTGTGCCAGCTCACTGGTGAAGAAAAACCACTCGCGGCCCAATACGCAAAACCGC CTCTCCCGCGCGTTGGCCGATTCAATATGACGCTGGCAGCAGAGTTTCCGCACTGGAAAGCGGGCAGTGA
<i>tetR</i>	ATGTCACAGATTAGATAAAAGTAAAGTGATTAAACGCGCATTAGAGTGCTTAAATGAGGTCCGAATCGAAGGTTTAAACACCCGTAACCTCGCCGAGAAGCT AGGTGTAGAGCAGCCTACATTTGATTGGCATGTAAAAATAAGCGGGCTTTGCTCGACGCCCTAGGCATTGAGATGTTAGATAGGCACCATACTCACTTTT GCCCTTTAGAAAGGGGAAAGCTGGCAAGATTTTTTACGTAATAACGCTTAAAGATTTTATAGTGTGCTTTACTAAGTCACTCGCGATGCGGATACATTTA GGTACACGGCCTACAGAAAAACAGTATGAACTCTCGAAAAATCAATTAGCCCTTTTATGCCAAACAAGGTTTTTCACTAGAGAATGCATATATATGCATCAG CGCTGTGGGGCATTTTACTTTAGGTTGCGTATTGGAAGATCAAGAGCATCAAGTCGCTAAAGAAAGAAAGGAAAAACCTACTACTGATAGTATGCCGCCAT TATTACGACAAGCTATCGAATTATTTGATCACCAGAGTGCAGAGCCAGCCCTTCTTATTCGCGCTTGAATTGATCATTCGGGATTAGAAACAACTATTA TGTGAAGTGGGTCTCTAA
<i>araC^{AM}</i>	ATGGCTGAAGCGCAAAATGATCCCTGCTGCCGGGATACTCGTTTAATGCCCATCTGGTGGCGGTTTAAACGCGGATTGAGGCCAACGGTTATCTCGATT TTTTATCGACGACCGCTGGGAATGAAAGTTTATATTCTCAATCTCACCATTTCGCGGTGAGGGGTGGTGAATAACAGGACAGAGAATTTGTTTGGCCGAC CGGCTGATATTTGCTGTTCCCGCCAGGAGAGATTCACTACGCGTCTCATCCGGAGGCTCGCGAATGGTATACCCAGTGGTTTACTTTCTCGCCGCGC GCCATCTGCGCATGAATGGCTTAACCTGCGCGTCAATATTTGCCAATACCGGGTTCTTTCGCCCGGATGAAGCGCACACCGCCGATTTCAAGCGACTTTTTCG GCAAACTATTAAACGCCGGCAAGGGGAAGGGCGCTATTCCGAGCTGCTGGCGATAAATCTGCTTGAGCAATTTGTTACTGCGGCGCATCTGACGATTAAACG GATCGCTCCATCCACGATGGATAAATCCGCTACCGAGGCTGTGTCAGTACATCAGCGATCACTGCGCAGACAGCAATTTTGAATATCCGACCGCTCGCAGCAG CATGTTTGTCTTGTGCGCGTGCCTGCTGTCACATCTTTTCCGCGAGCAGTTAGGGATTAGCGCTTAAAGTGGCGGAGGACCAACGATACAGCCAGGCGAA GCTGCTTTTGAAGCCACCCCGATGCCATTCGCCACCGCTCGCAATGTGGTGTGTTGTTTACGATCAACTCTATTCTTCGCGGCTTATTAATAAATGACCGC GGGCGACCCGAGCGAGTTCCGTGCCGGTTTGAAGAAAAAGTGAATGATGTAGCCGTCAAGTTGTCTATGA
<i>araE</i>	ATGGTCTATCAATACGGAATCTGCTTTAAACGCCAGTTCTTTGCGGGATACGCGGCGTATGAATATGTTTGTTCGGTAGCTGCTGCGGTGCGAGGATT GTTATTTGGTCTTGATATCGCGTAATCGCCGAGCGGTTCGCGTTCAATTACCGATCACTTTGTGCTGACCACTGCTTGCAGGAATGGTGGTTAGTAGCA TGATGCTCGGTGACAGCAATTGTCGCTGTTTAAATGTTGGCTGTCTTCCGCTGGGGCGTAAATACAGCCTGAGCGGGGGCCATCTCTGTTTGTACTC GGTCTATAGGGTCCGCTTTTGGCAGCAGCGTAGAGATGTTAATCGCCGCTCGTGTGGTGTGGCATTGCTGTCCGAGTCCGCTTACTTCAACCGCTCCTCT GTATCTTTCTGAAATGGCAAGTGAACACGTTTCGCGGTAAAGTATCAGTATGTACCAAGTTGATGGTCACACTCGGCATCGTGTGGCGTTTTATTCGATA CAGCGTTTCAGTTATAGCGGTAACTGCGCGCAATGTTGGGGTCTTGTGCTTTACCAGCAGTTCTGCTGATTATTTCTGGTAGATTCTTCCGCAATAGCCCGC CGCTGGCTGGCGGAAAGGGGCGTCATATTGAGCGGGAAGAAGTATTGCGTATGCTGCGCGATACGTCGGAAGGCGGAGAGAAGTCAACAGAAATTCG TGAAAGCCTGAAGTTAAACAGGGCGGTGGGCACTGTTAAGATCAACGCTAACGTCGCTGTGTTTCTCGGATGTTGTTGTCAGGGCATGCAGC AGTTTACCGGTATGAACATCATCATGTACTACGCGCGCGTATCTTCAAAATGGCGGGCTTTACGACCAAGACAACAGATGATTGCGACTCTGGTCTGTA GGGCTGACCTTATGTCTGCGCACCTTTATTGCGGTGTTTACGGTATGAAGCAGGCGTAAACCGGCTCTGAAATTTGTTTACGGCTTAGGCTTAGG CACTCTGGTGTGGGCTATTGCGTGTATGCAAGTTTGAACGGTACGGCTTCCAGTGGCTTGTCTGCGTCTCTCTGTTGGCATGAGCATGATGTGATTGCGG GTTATGCGATGAGCGCGCGCAGTGGTGTGGATCCTGTGCTCTGAAATTCAGCCGCTGAAATGCCGCGATTTCGGTATTACCTGTTGACCAACAGCAAG TGGGTTCGAATATGATTATTCGCGCGACCTTCTGACACTGCTTGATAGCATTTGGCGCTGCCGCTACGTTCTCGGCTTACACTGCGCTGAAACATGCGGT TGTGGGATTAATCTTCTGGCTCATTCGGAACCAAAATGTCAAGCTGGAACATATCGAACGCAAACTGATGGCAGGCGAAGATTGAGAAATATCGCGG TCTGA
<i>luxI</i>	ATGACTATATGATAAAAAATCGGATTTTTTGGCAATTCATCGGAGGATGAAGAGTATTCTAAGTCTTCGTTATCAAGTGTTTGAAGCAAAAGACTTGA GTGGGACTTAGTTGTAGAAAAAATACCTTGAATCAGATGAGTATGATAACTCAATGCAAGTAATATTTATGCTTGTGATGATACTGAAATGAAGTGGAT GCTGGCGTTTATTACCTACAACAGGTGATTATATGCTGAAAAGTGTTTTTCTGAATTTGCTTGGTCAACAGAGTGCTCCCAAGATCCTAATATATAGTCGAA TTAAGTCGTTTTCGTGTAGTAAAAATAGCTCAAAAGATAAATAACTCTGCTAGTGAATTAACAATGAAACTATTGAAAGTATATATAAACACGCTGTAG TCAAGGTATTACAGAAATGTAACAGTACATCAACAGCAATAGAGCGATTTTAAAGCGTATTAAAGTTCCCTGTCACTGATTTGGAAGCAAGAAATTC ATGATATTAGTGATACTAAATCGTTGTATGTCTATGCCATTAATGAACAGTTTAAAAAGCAGTCTTAAATTA
<i>rpal</i>	ATGCAAGTTCATGTTATTCGTCGTGAAAACTGTGCACGTGTATGCAGGTCTGCTGGAATAACTTTCGTATTGCGCATCAGATCTATGTTGTTGAACGTGG TTGGAAGAACTGGATCGTCCGATGTGCTGAAATTGATCAGTTTGATACCGAAGATGCAGTTTATCTGCTGGGTGTGATAACGATGATATGTTGCGAG GTATCCGTATGTTCCGACCACGATCCGACCTCTGCTAGTGTCTTTTTCCCGAGCTGCCACTGCGAGGTCCGGTCTCGCTCGCTGATGTAAGTCA AGCGCATTTTTTGTGTTCCGCGTAAACGTTGTAAGGATGTTGTCGCGTCGAGAAGCAGTTATTACAGGACAGCAATGGAATGATGCTCTGAGCATTTGG TCTGAGTGCATTTACCATTTGTTCTGGAACCTTGTGGCTGCGCTGCTGTTGATCAGGGCTGGAAAGCAAAACCGCTGGGTCTGCCGCGAGGATTAATG GTTTATGACCAACCGCAGTTATTGTGATGTTGATGATGATGATGGTGGGTATTGTTAATCGTCTGAGCGTCCGCGTACGATGCGGATGCGGATGCGGT CTGGAAGCAATTCGTCGTATAGCTGCCGGAATTTCAAGTTATTAGCTAA
<i>rpal^L</i>	ATGGAAGAGGACAGAAACAAGTCGACATTTTTCTGTTGAAAGCTCCCGACATTTACATCCCAACCATCTTCCGCTTCACTCGTACTGTTTTGAAAA CATTTCCGAATTCAGCAGCGCGCCCTGTCTCAATTAACGCGCGAAATAAGCAGATTACACCTACCGCGGATGTTGAACCTTAATTCCGCGAAAGTCGCGCGC GCCCTCCATAAGCAGGATATCCGCCCCAAGATACGATCATGATCCTGCTTCCCAACTCGCCGGAATTCGTTTTTCGCGTTTATTGGCGCGTCGTACCTGGGC GCAATCAGCACGATGGCCAAACCCCTTTTACCCCGCCGAGGTGGTTAAGCAAGCCAAGGCGAGCTCCGCCAAGATTATTGTCACGCAAGGATGCCAGCT CAATAAAGTTAAGGATTACGCAATTTGAAATGATGTGAAGATTATCTGCATCGACAGCGCCCGCAGGGCTGCCGCACTTCTCGGTCTTACGAGGCCA ATGAGCACGACATTCGCGAGGTGGAGATTACGCCCGATGACGCTGCTCGCGTCCCTATAGCAGCGGCACACGGGTCTGCCCAAGAGGTGTATGCTCACT CACAAAGGCTCGTGACGAGCTGGCACAACAGGTGGACGCGCAAAACCCAACTTTACATCCATTCCGAGGACGTTATGCTGTGTGTGCTCCCGCTGTT TCACATTTACTCCCTTAACCTCGTCTCTTCTTGGCGCTCCGCTGTGGCGCAGCAATCCTTATATGCAAAAAGTTCGTTGTGTCAGTCTCTCGAGCTCA TTCAACGCTACAAAGTCAGGATTGGCCCTTCGTCGCCCGGATTTGCTGCTGCGATTGCGAAGTCCCCCATGGTGGATGACTACGATCTCAGCAGCGTCCGT ACGGTCATGTTCCGCGCGGCACCGCTGCTGGAAGACTGGAGGATACGCTTCGCGGCAAAATCCCGAATGCGGAAGTCCGAGGTTCAGGATGACCGA GGCAGGTCCCGTGTCTGCCATGTGCTTGGCATTTCGCGAAGGAGCCCTTCGAGATCAAGAGCGGTGCTGCGGCACCGTCTGTTGGAACCGGAAATGAAA TCGTTGAGACCCCAAAACCGCAATTTCCCTTCCCGCGCAACCAATTCGCGGAAATTTGATCCGCGGTGACCAAGATTATGAAGGGCTATCTTAATGACCCGGAA GCCACGGCGGAGCAGATTGACAAAGAAGTTGGCTGTATACCGGATGACATTTGGTTACATCGACGATGACGACGAGCTTTTATTGTTGGACCGGCTCAAGA ACTCATCAATATAAAGGCTTTCAAGTTGCGCCCGCGAGGCTGGAGGCACTGCTTCTTAACCATCCCAACATCTCGGATGCCGCGGTCTGCGCATGAAGG ATGAAAGCCGGGTGAAGTGGCGGTGCGGTTTTGTGTTTCGGAAGCAACGATCCAGCTCCAGATACGAGGATGAGGTTAAGGATTTTATTCGGAAGGTTATC TTTTATAAACCGGATTAAACGCGTTTTCTTCGTGATGCCATCCCCAAATCCCCAGGCGCAAGTCTTCGGAAGATCTTCGTGCGAAACTGCGACGAGG TCTTCCGAATTAG
<i>mccA</i>	ATGCGTACTGGTAATGCAAACTA
<i>mccBCDEF</i>	ATGGATTATATATTTGGTTCGCTATGTCAAAATGCTCGATACGGAGCGGTGGATTAGTTGGTGAGGCGGAAAGGAGCAATATGTTGAGGATTAGCGCT TTGGGAAAAATTTATAAAACCGCATATTTGTTTCATAACCCCATCGAGTTATATCTGACGCGTGGAAACTGTCAATATGAACTGAAAAAGATTTCTCTAATT GCTTTTAGGTTCTTAAAGAAAAATTTCTTTATTATACCTAGTGAGTATAAATACTCTACTAGAGAATAATCGTTACTCTCGTAACTTTTACATTTATCAAGT TATGGTGCTAACCCGTGTTCTTGTGCAAGATAAACTAAAGATGCTAAGGTAGTAATCTTGGTTGTGGGGGTATAGGAAATCATGTATCTGTTATACCTGC

	AACGTCCTGGTATTGGCGAAATTATACTAATTGATAATGATCAAAATAGAAAATACAAATTTGACAAGGCAGGTTTTATTTCAGAGAATGATGTCGGTAAAA TAAAAACAGAAAGTTATAAAACGCGAGTTATTAAAAAGAAACTCTGAAATTTCCGGTGTCTGAAATCGCTTTGAAATATAAACGATTTACACTGATCTTCATAAG GTACCAGAGCTGATATATCGGGTCTTTCTCGCAGATCATCCATTTAATCTGATCAACTGGGTTAATAAATATTGCGTTAGACGCAAAATACGCCCTATATATAA TGCTGGGTATGTTAATGATATTGCAGTCTTTGGTCCATTATATGTTCTCGTGGTAAAAACAGGATGTTATGAGTGCCAAAAAGTCGTGCAGATCTATATGGTT CAGAAAAGGAAAAACATTGATCATAGATTAAAGCTAATCAATAGCAGATTAAACCAGCAACATTTGCACCTGTGAATATAGTTGCCGCTGCATTTATGTGGC GCAGACGTAATTAAAGTTCAATTGAAAAATCTCCGAGCCATTATCACTTAATAAAAAGAATAGGCATCTGGTCAGATGAAATAAAAATACATTTCCCAAAATAT GGCCCGTTCCGCTGTTTGGCTCTGTGTGGGAAATAGAAATGTAATCTGCAAAATATTTATCTGTGAACATGGAGCTATAATGCTATACGATATGTTAAT TGGTGCTACCATGCGACATTTCTTATATCTACAGGTGTCACTATATCTCAACTTGGCTGTTTACAAATCGTTTTTCTGTGACAGTGCTGATTTCTGATT TTCCTTTATCTGTCAATTGCAGACAGATTTTACAGGAAACAGGTTGTAGTTAGTGGCGTATTTTTACTATTTTATTTTACCCTCTTTGATATTCACTGCTCCT GATATGCTGGCATTGGTTTTTCTGAAATATTTTATGCCATTGGTATTGGTTGTATATCTGGGGCTATAGAGGGATGGGTGTTAAGTGCTCTGGATGGTAG AAATGAAAAATTTACCTTATCTGCTCATTTTATGCGGAAAGCGTATCTCCCTTTGGGAGTGTGATAACTGGTGCTGTTTGGAAATTTAGTTTCTTACTTCTATC ATTCTTATAAATCTGGCTATATAGTATCGTTCTCTTGTATGTTTGGTTGTCTTTTATCTGTAATAAATCAACGGCAGTGGGGGTGAAAAAGAA GCACGAGATAGTATTATTAACAAGCAAAAGAGAGTATTGGATTGATAACAGGAAGTTATAATGGGACATATTTTTATCTATAACATGATGTTTACACT TGGTATACAGGTAATTTATCATTTTTTGGCAGCCAAATTATGTTATCTGGGGAAGTATTGGCTCATTTATCAAAAAGAGAGCTTATAACTTTACTGATGTCT ATATTGGTGCAATTTTCAATGCAATATATAGCAAACTATTTTATGCCAAAGATAGATGTAAGATGTAAACTTTATATACTTGTGTTGATACATTTATGTTCAATT CTTAGTTCAATCGCCTGTATTTTACTATTTTATGTTAATAACAGATAAATAATGTTTCTCGGTGATGCTATTTTCTCTATAATCCATGGGATGCTTCAAC AATACCTGTTGGAGCAGAGAATATATTCATAAGCAGACTTAAATGSCAATTATAAGAATATATTTCGGGAGCTCTGGCTTGTGTTCTCTCTATGTTCTGAT TGTGTTCCATTTCTGTGTTGGGAGTTATATCTGTATTACCAGGTAATATGCCCTGTCAACCATTTATATATTTATCTCTGAATTCGATGCTACTGCTGGT TGTTTGTCTTAAATGTGGTCCTTTTAAAAAGGAGATGATGACGATTAAAGCATGCTGAAGAATTCACGGAAGAAGTCATTTTAAATATGAATTACCTGAT TTTGTGCTCTGATGCAACAGGATAACACTCCCTCCTGGAGCAGAGTACACCATAGACTACTGGATTAAAGCATGGATGATTAAACAAAAGCTCCACCTATT AGATTTAGCATGTTCCACGGGTTTTAGTTCAGTGAAATGCTTCAAAAAGGAAGGTGCATCTGCAGAGGGTATTGATATATCTGAAATCTGTAATGTCGTCG CAAAATGAAAAGGCAAAAAGCTTAAGGCTAAATAATTTATTGAAATATTTATGTAGCTGATGCTTGTGATTACCAATTTGAAGATACACATTTTACACATGTT CTCGGTGGAATGTAATTTTGCATTTATACAAAAATCGGTTAATAGCCTTGAATGAACTCATCGATGTTTAAACCACATGGGAGGATGTCGATTTCAAAATTT TTATTACAGGCGTAAAAATATCAGATAAACTTATCAATGATGTATATAATGCAATAAAATTCAGACCCCAATCCCTTGTGGACATTTGGAATACCTGGCATCAGT TTTTTTCTGAAAGATTACTCTGGTTTTCAGAAGAAAATCATGAGTGAATCTCAAAGTGAAGATGAGTTTAAAGCCGATTTTATGATTACATTTTCAAT AGAAATGAGTTTACAAAAGCTTGAATGGTTCACTTCAGAATGTATTTTTGAAAGATTTTTAAAAATACGCAGACCATTAATATCCAAAGAGATTATCA GGGAGTTACATTGCAAAATATGGCGCAAAAAATACACCATCAAAATTTGTTAAACATGCCCCGGGAGTTAATTTAAAGGGGATTTGAATCGGGCGATAAATC ATTTGTCACTTTTGTAGTAGATGGAGCTCTGGAGCGCTGGAACATTACAGGTGTCAACTTAAGAGTTTTTCCCCAACAGCAGATTTCCGCATTTTCAATCA AGTCAAAATATCTGGCACAATGGTGCCAGATTATCTCAGGTAAGGTTTGTATCGACAGGTGTGCTCTGTGATGAAATGAACCTCGCTTAAAAAGAGACCGT TTTTAACCGGATTGTTTTTGTATGGCCCTTTAAAAAAAACGAGTGAACATTTAAAGGCAATAGAGATTGGGGCATTAATTTGAAGTTGCAATATTTGATGAATG TAAAGACTTTAATGAACATATGTAATTTGCAATAGTTGACATGTAGAATTCAATTTGAGATTATCGCATTTACTATGATGATAAATTTATCAAGATTTTGGCTTAT CTGAAAGTGAGGCTATTAATTTACTGGAGATGTTGATCAGTAAGTCAGAGTATCTCATTTTAGACGGGTTCCATTTACATGTGGCTCTTAATCTACCCCAAT GCGGAAAAAATATGTAAGCTGTTATACAGTATCATGAGTTGATTCTTAGGTATATGCCAGATGATGGCACTCTTAATCTTGGTAGTGGGATACCTCGAGA TCTTTTTCTCAGCATCCAGTGATAACCCAACTCCATGTCCGGAGGTATTTTTCTCATCGATATATGATACAATAAAAAATTTGCTTCGGTACTGTATGTGATA AATGGAACATATATTTTTGAACCTGGGAGACATCTGGTTCGAAGACTTTGGCTACTTTATAGGGGAAAGTTATTAGTACTAAAAAGGATGTTGGTTTAAAGTT GCTCAAACTAACATTTGGTATAAATCGGATACCTTCGATCAGAAATTTGGGACCATTTCAATTTACATTTGTTTCAATAATCAACCATATTTTCCAGATGATAAATC TGATGAGTATATTTTGTGGATTCAATTGCTTTGAATGTGATTGCTTTGTTCTTCAGTTATCTTCCAGTAACCTTTATCTGATTATTTTCTGTTCT GAGGGTGTGGTCTTATGATATGCAAAACAGGAAACAGTGGAGCGGTAAATCTTTATGCTGTATATACCATAACAAATGATGTTGTTAATATATCAAGGATT CACAGAGGAAGACTTTGATTTTCGGGAAGTATGATGTATCTCTTACGCGCATCAGGAATAAAGTAATGATGAGATTACATTTATGTTATGTCAGCGTTAAATA GCTGTGAAGAGTTATATTGCTCATTAAATCAAAACAAAATAAATTTTCAATAAAGCATGGCATGGCCAGCGGTTGTTAATAACATTTCTGATTTCTGTTCTCT TCATTTGAGCAATCAATGATTGATAAACAGAAATGAAAAGCAATTAATCCCTTTTATTAATACAAAACATAAGATAGCTTGGCCTGTATCTTTTATATTATT GACCATGCCAATAAAACAGCATATATTTGGCTATTGGTTAGGCGCTAACTTTACGGGAAAGGGGATTGTAAACCAATGCTATAAATAAACTGATACAGGAGTA TGGGGATTTCGGGCGTTATAAAAAGATTGTTATATAAATGTATTTGTGATAATAAAAAAGTAATGCCACGGGATTGAGGTGTGGCTTCACCTTAGAGGGGTG TTCGCAAAAAGCAGAAATACTCAACGGTGTATCATACGATCAAAATATTTATTCGAAAGTAAATGGTTAATGATGGTTCAATTTTGACATTAATGGAAAG GAAAAATCCTCATGATGATACAATCTCATCCGCTACTTGGCCGCTCCCTCGGCAGTAGGAGATACAAATGGTTCTTTTTCATCATCTGCTCGCGCAACAGTT ACTGCAAAAAATCGTTTTTTTTCGGGAGTTGAGTTTCTTCAGAGAAAGGAGTTTAAAGTGGTATCAGGGAAGCTTACCCGTAAACACAGATTGTTTATCGCTC AGGTACTATTAAAGAAAGAGCTCAAGAATTTAATGAGTTAGTCTACAATCCTGATATTACCTGTATAAATGCTCAACGATCGGTGGAGATTAACAGTAATTCAC TACTACCGTTTTCTGCACTATGATGCTCATCTGCAAAACCCCAAAATATCATAGGTTACTCAGATACAACCTGCTTTATAGCAGGAATATATGCAAAAACA GGGTTAATAACATTTCTATGGGCCAGCTCTTATCTCTCGTTTGGTGAGCATCCACCTCTTGTGGATATAACATATGAATCATTTATTATAAAATACATAACAG AAAACAATCAGGAATATATACCTACACATTACCTGAAAAGTGGAGTGATGAGAGCATAACTGGAATGAAAACAGATATTAAAGGCTTAAGAAACATATATA AAAACACTGTGCCTTTTTATGGTTCCGGAAGAGTTGAGGGCGTGTAATTTGAGGAAATCTAAATACTTTGACAGGTATATGGGAGGATGAAATGGATGCTC GAAATTCGGAATGGAGATATATTGTTTATGAGGACAGTCGGAAGACGATTGCAACAGTTGAACGATTATTTCTCTATGCTAAAGCTTTATCGCGTGTGTTGA TAAAGTTAGTGCAATAATACTCGGGAACATGAGCTTTTGATTGTGAGGAAAGTAAACCGAGCCATATGAAGTATTAACAGAGGTTATACAGAGGTAATGAGGAAAC AAATTCCTGTACTGGATGGATTGATTGTTTCACATACACATCCAATGCTAACTCTTCCACTTGGTGTAATAATAGCTATTGACTTTGACAAACAAAATATA TCTATAACAGAAATATCTATCTACCGGAAATAA
mRFP1	ATGGCTTCTCCGGAAGCGTTATCAAGAGTTCATGCGTTTTCAAAGTTCGTATGGAAGGTTCCGTTAACGGTCACGAGTTCGAAATCGAAGGTGAAGGTGA AGGTCGTCGTCACGAAGGTACCCAGACCGCTAAACTGAAAGTTACCAAAGGTGGTCCGCTCGCGTTCGCTTGGGACATCCGTGCCCCGAGTTCACGATACG GTTCCAAAGCTTACGTTAAACACCCGGCTGACATCCCGGACTACCTGAAACTGTCCCTCCCGGAAGGTTTCAAATGGGAACGCTGTATTGAACCTCGAAAC GGTGGTGTGTTTACCCTTACCAGGACTCCTCCCTGCAAGACGGTGAGTTTCATCTACAAGTTAAACTGCGTGGTACCAACTTCCGCTCCGACGGTCCGGT TATGCAAGAAAAAACCATGGGTTGGGAAGCTTCCACGCAACGTATGTACCCGGAAGACGGTGCTCTGAAAGGTGAAATCAAAATGCGCTGAAACTGAAAG ACGGTGGTCACTACGACGCTGAAGTTAAACACCACTACATGGCTAAAAAACCGGTTCAAGTCCCGGCTGCTTACAAAACCGACATCAAACTGGACATCAAC TCCCACCAAGAGACTACACCATCGTTGAACAGTACGAACGTGCTGAAGGCTGCTCACTCCACCGGTGCTTAA
YFP	ATGGTGAGCAAGGCGCAGGAGCTGTTACCAGGGTGGTGCCCATCTCGGTGAGCTGGACGGCGACGTAAACGGCCCAAGTTTCAGCGTGTCCGGCAGGG CGAGGGCGATGCCACCTACGGCAAGCTGACCTCGAAGTTTCATCTGCAACACAGGCAAGCTGCCCGTGCCCTGGCCCAACCTCGTGACACCTTCGGCTACG GCTTGCAATGCTTTCGCCCGCTACCCGACACATGAAGCTGCACGACTTCTTCAAGTCCGCGATGCCCGAAGGCTACGTCAGGAGCGCACCATCTTCTTC AAGGACGACGGCAACTACAAGACCCGCGCGAGGTGAAGTTTCGAGGGCGACACCTGGTGAACCGCATCGAGCTGAAGGGCATCGACTTCAAGGAGGACGG CAACATCCTGGGGCACAAGCTGGAGTACAACATACAACAGCCACACGCTATATATCATGCGCGACAAGCAGAGCAAGGATCAAGGTGAACCTCAAGATCC GCCACAACATCGAGGACGGCAGCGTGCAGCTCGCCGACCACTACCAGCAGAAACACCCCAATCGGCGACGGCCCGTGTGCTGCGCCGACAAACCACTACCTT AGCTACAGTCCGCCCTGAGCAAGACCCCAACGAGAGCGCGATCATATGCTCTCTGAGGTTGCTGACCGCCGCGGGATCACTTCGGCATGGACGA GCTGTACAAGTAA
Terminators	
DT60	ACATTTAATAAAAAAGGGCGGTGCGAAGATCGCCCTTTTTTACGTATGACACCTCGTCTCAACAAAGCAATCAACAGTGAAAAATGGCGCCCATCGGC GCCATTTTTTATGGTTCTTTATCATCTGGCGAATCGGA
DT11	AACGCGATGAGAAAGCCCCGGAAGATCACTTCCGGGGGCTTTTTTATGCGCTCCTTGGCCCTCCATCCTTAGATAGTTACGCCAAAAAACTTAAGACCG CCGGTCTTGTCCACTACCTTGCGATTAATGCGGTGGACAGGATCGGCGGTTTTCTTTTCTCTCTCAATCATAGGCAATACGATCGCATGTCC
F2	AAAAAAAACCCCGCCCTGACAGGGCGGGTTTTTTTTT
IOT	TAATTGGTAACGAATCAGACAAATTGACGGCTCGAGGAGTAGCATAGGGTTTGCAGAATCCCTGCTTCGTCCATTTGACAGGCACATTATGACATCGATGAT AAGCTGTCAAAACATGAGCAGATCTCTACGCGGACGACATCGTGGCGGCATCACCAGGCGCACAGGTGCGGTGCTGCGCGCTATATCGCGCATCAAC GATGGGGAAGATCGGGCTCGCCACTTCGGGCTCATGAGCAAAATTTTATCTG
ECK120017009	GATCTAACTAAAAAGGCGCTCTGCGGCCCTTTTTTCTTTTCACT
DT54NSNS	GGAAACACAGAAAAAGCCCGCACTGACAGTGGGGGCTTTTTTTTTTCGACCAAGGCTCGGTACCAAAATCCAGAAAAAGACCCCGAAGGGTGTTTTTT CGTTTGGTCC
L3S3P21	CCAATTATTGAAGCCCTCCCTAACGGGGGCGCTTTTTTGTGTTCTGTGCTCC
L3S2P21	CTCGGTACCAAAATCCAGAAAAGAGGCGCTCCCGAAGGGGGGCTTTTTTCTGTTTTGGTCC

Appendix Table S2: Quorum sensor activator proteins		
Protein	Amino acid sequence	Source
CinR	MIENTYSEKFESAFEQIKAAANVDAAIRILQAEYNLDFVTYHLAQTIAASKIDSFPVVRTTYPDAWVSRYLLNSYVKVDPIV KQGFERQLPFDWSEVEPTPEAYAMLVDAQKHGIGGNGYSIPVADKAQRALLSLNARI PADEWTELVRRCRNEWIEIAHL IHRKAVYELHGENDFPVPALSPREIECLHWTALGKDYKDISVILGISEHTTRDYLKTARFKLGCATISAAASRAVQLRIIN P	iGEM C0077 (Chen <i>et al</i> , 2015; Lithgow <i>et al</i> , 2000)
CinR ^{AM2}	MIENTYSEKFESAFEQIKAAANVDAAIRILQAEYNLDFVTYHLAQTIAASKIDSFPVVRTTYPDAWVSRYLLNSYVKVDPII KQGFERQLPFDWSEVEPTPEAYAMLVDAQKHGIDNGYSIPVADKAQRALLSLNAHI PADEWTELVRRYRNEWIEIAHL IHRKAVYELHGENDFPVPALSPREIECLHWTALGKDYKDISVILGISEHTTRDYLKTARFKLGCCTISAAASRAVQLCIIN PYRIRMTRRNW	Evolved (This work)
LasR	MALVDGFLERSSGKLEWSAILQKMASDLGFSKILFGLLPKDSQDYENAFIVGNYPAAWREHYDRAGYARVDPTVSHCT QSVLPFIWEPSIYQTRKQHEFFEEASAAGLVYGLTMPLHGARGELGALSLSVEAENRAEANRFMESVPTLWMLKDYALQ SGAGLAFEHFVSKPVVLTSTREKEVLQWCAIGKTSWEISVICNCSEANVNFHMGNIIRKFGVTSRRVAAMAVNLGLITL	(Tamsir <i>et al</i> , 2011)
LasR ^{AM}	MKNINADDTYRIINKIKAFRSNNDINQCLSDMTKMVHCEYYLLAI IYPHSMVKSDISILDNYPKKWRQYYDDANLIKYP IVDYSNSNHSPINWNI FENNAVNKKS PNVIKEAKTSGLITGFSFPIHMANNGFGMLS FAYSEKDNYIDSLFLHACMNI PL IVPSLVNDYRKINIANNKSNNDLTREKECLAWACEGKSSWDISKILGCERTVTFHLTNAQMKLNTNRCQISKAILT GAIDCPYFKN	Evolved (This work)
LuxR	MKNINADDTYRIINKIKACRSNNDINQCLSDMTKMVHCEYYLLAI IYPHSMVKSDISILDNYPKKWRQYYDDANLIKYP IVDYSNSNHSPINWNI FENNAVNKKS PNVIKEAKTSGLITGFSFPIHMANNGFGMLS FAYSEKDNYIDSLFLHACMNI PL IVPSLVNDYRKINIANNKSNNDLTREKECLAWACEGKSSWDISKILGCERTVTFHLTNAQMKLNTNRCQISKAILT GAIDCPYFKN	(Moon <i>et al</i> , 2012)
LuxR ^{AM}	MKNINADDTYRIINKIKAFRSNNDINQCLSDMTKMVHCEYYLLAI IYPHSMVKSDISILDNYPKKWRQYYDDANLIKYP IVDYSNSNHSPINWNI FENNAVNKKS PNVIKEAKTSGLITGFSFPIHMANNGFGMLS FAYSEKDNYIDSLFLHACMNI PL IVPSLVNDYRKINIANNKSNNDLTREKECLAWACEGKSSWDISKILGCERTVTFHLTNAQMKLNTNRCQISKAILT GAIDCPYFKN	Evolved (This work)
RpaR	MIVGEDQLWGRRALEFVDSVERLEAPALISRFESLIASCGFTAYIMAGLPSRNAGLPELTLANGWPRDWFVLYVSENFSA VDPVPRHGATTVHPFVWSDAPYDRDRDPAHRVMTAAEFGLVEGYCIPHYDDGSAAISMAKDPDLSPAARGVMQLVS IYHSRLRLALS RPKPIRRNRLTPRECEILQWAAQKTAWEISVILCITERTVKFHLIEAARKLDAANRTAAVAKALTGL IRL	(Schaefer <i>et al</i> , 2008)
RpaR ^{AM2}	MIVGEDQLWGRRTLEFVDSVERLEAPALISRFESLIASCGFTAYIMAGLPSRNAGLPELTLANGWPRDWFVLYVSENFSA VDPVPRYGATTVHPFVWSDAPYDRDRDQAAHRVMTAAEFGLVEGYCIPHYDDGSAAISMAKEDPDLSPAARGVMQLVS IYHSRLRLVLS RPKPIRRNRLTPRECEILQWAAQKTAWEISVILCITERTVKFHLIEAARKLDAANRTAAVAKALTGL IRL	Evolved (This work)

Appendix Table S3: Sequence of plasmids used in this study

Appendix Table S3: Sequence of plasmids used in this study	
plasmid	DNA sequence ^A
pAJM.431	SACCTCAGCGTAGCGGAGTGTATACCTGGCTTACTATGTTGGCACTGATGAGGGTGTGAGTGAAGTGCCTTCATGTGGCAGGAGAAAAAGGCTGCACCGGTGGC FCAGCAGAATATGTGATACAGGATATATTCGGCTTCCTCGCTCACTGACTCGGTACGCTCGGTCGTTCGACTCGCGGAGCGGAAATGGCTTACGAACGGGGGCG GAGATTCTCGGAAGATGCCAGGAAGTACTTAACAGGGAAGTGAGAGGGCCGCGGCAAGCCGTTTTTCATAGGCTCCGCCCCCTGACAAGCATCACGAAA CTGACGCTCAAACTCAGTGGTGGCGAAACCCGACAGGACTATAAAGATACACAGGCGTTTCCTCGGCGGCTCCCTCGTGGCTTCTCTGCTTTCGGT TTACCGGTGTCATTTCGGCTGTATGCGCCGGTTTTGCTCATTCACGCGCTGACACTCAGTTCCGGGTAGGCAGTTCCGTCGAAGCTGGAGTGTATGACGAAAC CCCGCTTCAGTCCGACCGCTGCGCCTTATCCGGTAACATATCGCTTTGAGTCCAAACCCGGAAGACATGCAAAAGCACCACTGGCAGCAGCCATGGTAATTGAT TTAGAGGAGTTAGTCTTGAAGTCATGCGCGGTTAAGGCTAACTGAAAGGACAAGTTTTGGTGACTGCGCTCCTCCAGCCAGTTTACCTCGGTTCAAAGAGTT GGTAGCTCAGAGAACCCTTCGAAAAACCGCCCTGCAAGCGGTTTTTCGTTTTACAGCAAGAGATTACGCGCAGACCAAAACAGTCTCAAGAAGATCATCTTT TTAAAGGGTCTGACGCTCAGTGGAAACGAAAAATCAATCTAAAGTATATATGAGTAAACTTGGTCTGACAGTTACCTTAGAAAACTCATCGAGCATCAAAATGAA ACGTCAATTTTATTCATATACAGATTATCAATACCATATTTTGA AAAAGCCGTTTTCTGTAATGAAGGAGAAAACTCACCGAGGCATTTCCATAGGATGGCAAGA TCCTGGTATCGGTCTGCGATTCCGACTCGTCCAACATCAATACACCTATTAATTTCCCTCGTCAAAAAATAAGGTTATCAAGTGAGAAATCCACATGAGTGAC GCTGAATCCCGTGAGAATGGCAAAAGCTTATGCAATTTCTTCAGACTTGTTCACACGGCCAGCCATTACGCTCGTCATCAAAATCACTCGCATCAACCAAC CGTATTATTCGTGATTGCGCCTGAGCGAGACGAAATACCGGATCGCTGTATAAAGGACAATTACAAACAGGAATCGAATGCAACCGGCGCAGGAACACTGCG AGCGCATCAACAATATTTTACCTGAATCAGGATATTTCTTAATACCTGGAATGCTGTTTTCCCGGGGATCGCAGTGGTGAATACCATGCATCATCAGGAT ACGGATAAAATGCTTGATGGTCGGAAGAGGCAATAATCCGTCAGCGAGTTTAGTCTGACCATCTCATCTGTAACATCATTTGGCAACAGCTTACCTTTGGCATGTT TCGAGAAACAACTCTGGCATCGGGCTTCCCATACAATCGATAGATTGTCGACCTGATTGCCGACATATTCGCGAGCCCATTTATACCCATCATTTAATGAGCA TCCATCTTGGAAATTTAATCGCGCCTTCGAGCAAGACGTTTTCCCGTTGAATATGGCTCATAAACCCCTTGTATTACTGTTATGTAGAAGCAGTAAAAATGATG TCATGATGATATATTTTATCTCTGCAATGATACATCAGAGATTTCGAGACCAACCAATTTTGAAGGCCCTCCCTAACGGGGGGGCTTTTTTTCGTTCTCGCT TCCCGCTTAACGATCGTTGGCTGTGTGACAATTAATCATCGGCTCGTATAATGTGTGAATTTGTAGCGCTCACAATAGCTGTACCGGATGTGCTTTCCGG TCTGTAGTCCGTGAGGACGAAACAGCTCTACAATAATTTTGTAAATAGAGCAAGATAAAGAACACTTTATGACTATAATGATAAAAAATCG GATTTTTTGGCAATTCATTCGAGGAGTATAAAGGTTATCTAAGTCTTCGTTATCAAGTGTATAAGCAAGACTGTAGTGGGACTTGTGTGAAAAATACCT TGAATCAGATGAGTATGATAACTCAAATGCAAGATATATTTATGCTGTGATGATGATACTGAAATGTAAGTGGATGCTGGCTTTATCTACACAGGTTGATT ATATGCTGAAAGTGTTTTTCTGAAATGCTTGGTCAACAGAGTGTCTCCCAAGATCTTAATAGTCGAATTAAGTCGTTTGTGTAGTAAAAATAGTCTCA AAGATAATAACTCTGCTAGTGAATTTACAATGAACTATTTGAAGCTATATATAAACACAGCTGTTAGTCAAGGATATACAGATATATACACGATCAAC AGCAATAGCGGATTTTTAAAGCGTATTAAGTTCCCTGTGATCGTATTGGAGCAAGAAATTCATGATTAGTGATCAATTCGGTTGATTGTCTATCG CTATTAAAGACAGTTTTAAAAAGCAGCTCTAAATTAATCTCGTACCAATTTCCAGAAAGAGGCCCTCCCGAAAGGGGGGCTTTTTTCGTTTTCGTTCCGCTAAGTGG CGGCGCGCCATCGAATGGCGCAAAACCTTTTCGGGTATGGCATGATAGCGCCCGGAAGAGAGTCAATTACAGGTTGGTGAATATGAAACAGTAACTTATACGA TGTGCGCAGGATGCGCGGTGTCTTTATATGACCGTTTCCCGCGTGGTGAACACGGCCAGCCAGCTTTTCGCGAAACCGCGGAAAAAGTGAAGCGCGGATGG TGAGCTCAATTTACATTTCCCAACCGCGTGGCACAACAACCTGGCGGCAACAGCTGTGCTGATTGGCGTTGCCACCTCCAGCTTCCGCTCGACGCGCGTGC CAATTTGTCGCGCGGATTAATCTCGCGCGCATCAACTGGGTGCCAGCGTGGTGGTTCGATGGTGAAGCAAGCGGCGCTGAAGCTGTAAAGCGGCGGTGCA CAATCTTCTCGCGCAACGCGTCAGTGGCTGATCATTAACCTACCGCTGGATGACAGGATGCCATTGCTGTGAAGTGCCTGTGCACTAATGTTCCGCGTAT TTCTTGATGTCTCTGACGACACCCATCAACAGTATTTACTCCCATGAGGACGCTACGCGACTGGGCGTGAAGCATCTGGTGCATGGGTGAGTCCAGCAAA ATCGCGCTGTTAGCGGGCCATTAAGTCTCTGCTCGCGCGCTCTGCGTCTGGCTGGCATAAATATCTCACTCGCAATCAATTTCTTCCAGTCCGCGGCAAGC GGAAGCGCATGGAGTGCCATGTCCGTTTTTCAACAAACCATGCAAAATGCTGAATGAGGCGATCGTTCCTCACTGCGATGTGTTGCCAACGATCAGATGGCGC TGGGCGCAATGCGCGCATTACCGAGTCCGGCTCGCGCTTGGTGGGATATCTCGTAGTGGGATACGACGATACCGAAGATAGCTCATGTTATATCCGCGC TTAACCAACATCAACAGGATTTTCGCGCTCTGGGCAACACAGCGTGGACCCGTTGCTGCAACTCTCTCAGGCGCAGCGGTGAAGGCAATCAGCGTTTGGC AGTCTCACTGGTGAAGAAACCAACCTCGCGGCCAATACGCAAAACCGCCTCTCCCGCGCGTTGGCGGATTCATTATGACAGCTGGCAGCAGAGTTTCCCG GACTGGAAGCGGGCGAGTGAAGGATCCTAATTTGGTAAGCTACGACAAATGACGGCTCGAGGAGTAGCATAGGTTTGGCAAGATCCCTGCTTCTGCTCAAT TGACAGGACATATGATCGATGATAGCTGTCAACATGAGCAGATCTCTACGCGGACGATCGTGGCGGATCACCGGCGCACAAGTGGCGTGTGCTG GCGCTATATCGCGACATCACCGATGGGAAGATCGGGCTGCCCACTTCGGGCTCATGAGCAAAATTTTATCTGAGGTGCTTCTCGTCACTGACTCGCTG CACGAGGCA
pAJM.715 ^B	SACCTCAGCGTAGCGGAGTGTATACCTGGCTTACTATGTTGGCACTGATGAGGGTGTGAGTGAAGTGCCTTCATGTGGCAGGAGAAAAAGGCTGCACCGGTGGC FCAGCAGAATATGTGATACAGGATATATTCGGCTTCCTCGCTCACTGACTCGGTACGCTCGGTCGTTCGACTCGCGGAGCGGAAATGGCTTACGAACGGGGGCG GAGATTCTCGGAAGATGCCAGGAAGTACTTAACAGGGAAGTGAGAGGGCCGCGGCAAGCCGTTTTTCATAGGCTCCGCCCCCTGACAAGCATCACGAAA CTGACGCTCAAACTCAGTGGTGGCGAAACCCGACAGGACTATAAAGATACACAGGCGTTTCCTCGGCGGCTCCCTCGTGGCTTCTCTGCTTTCGGT TTTACCGGTGTCATTTCGGCTGTATGGCCGGTTTTGCTCATTTCCACGCTGACACTCAGTTCCGGGTAGGCAGTTTCGCTCCAGCTGGACTGTATGACGAAAC CCCGCTTCAGTCCGACCGCTGCGCCTTATCCGGTAACATATCGCTTTGAGTCCAAACCCGGAAGACATGCAAAAGCACCACTGGCAGCAGCCATGGTAATTGA TTTAGAGGAGTTAGTCTTGAAGTCATGCGCGGTTAAGGCTAACTGAAAGGACAAGTTTTGGTGACTGCGCTCCTCCAGCCAGTTTACCTCGGTTCAAAGAGT TGTAGTCTCAGAGAACCCTTCGAAAAACCGCCCTGCAAGCGGTTTTTCGTTTTACAGCAAGAGATTACGCGCAGACCAAAACAGTCTCAAGAAGATCATCTT ATTAAAGGGTCTGACGCTCAGTGGAAACGAAAAATCAATCTAAAGTATATATGAGTAAACTTGGTCTGACAGTTACCTTAGAAAACTCATCGAGCATCAATGA AACTCGCAATTTATTCATATCAGGATTATCAATACCATATTTTGA AAAAGCCGTTTTCTGTAATGAAGGAGAAAACTCACCGAGGCAGTTTCCATAGGATGGCAAG ATCTCGTATCGGCTCGGATTTCGACTCGTCCCAAGATCAATACAACTATTAATTTCCCTCGTCAAAAATAAGGTTATCAAGTGAGAAATCAGCATGAGTGA CGCATGAATCCGGTGAGAATGGCAAAAGCTTATGCAATTTCTTCCAGACTTGTTCACAGGCGCAGCCATTACGCTCGTCATCAAAATCACTCGCATCAACCAAA CCGTTATTCATCTGATGATTGCGCCTGAGCGAGACGAAATACGCGATCGCTGTAAAAGGACAATTAACAACAGGAATCGAATCAACCGGCGAGGACACTGCG CAGCGCATCAACAATATTTACCTGAATCAGGATATTTCTTAATACCTGGAATGCTGTTTTCCCGGGGATCGCAGTGTGAGTAAACATGCATCATCAGGAG TACGGATAAAATGCTTGATGGTCGGAAGAGGCAATAATCCGTCAGCCAGTTTAGTCTGACCATCTCATCTGTAACATCATTTGGCAACGCTACCTTTGCCATGT TTCAAGAAACAACTCTGGCGCATCGGGCTTCCCATACAATCGATAGATTGTCGCACTGATTGCCGACATTTATCCGAGCCCATTTATACCCATATAAATCAGC ATCCATGTTTGAATTTAATCGCGCCTCGAGCAAGACGTTTTCCCGTTGAATATGGCTCATAAACCCCTTGTATTACTGTTATGTAAAGCAGACAGTTTATTGT TTCATGATGATATATTTTATCTTGTGCAATGTACATCAGAGATTTTGAGACCAACCAATTTTGAAGGCCCTCCCTAACGGGGGGGCTTTTTTGTCTTCTGGT CTCCCGCTTAACGATCGTTGGCTGTGTGACAATTAATCATCGGCTCGTATAATGTGTGAATTTGTAGCGCTCACAATAGCTGTACCGGATGTGCTTTCCG GTCTGATGAGTCCGTGAGGACGAAACAGCCTCTACAATAATTTTGTTTAACTAGAGAAAGAGGGGAAATACTAGTGGTGAGCAAGGGCGAGGAGCTGTT ACCGGGGTGGTCCCATCTCGGTGAGCTGGACGGCGACGTAAACGGCCACAAGTTTACGCTGTCCGCGAGGGCGAGGGCGATGCCACCTACGGCCAGCTGAC CTGAAGTTTCACTGCACCAACAGCAAGCTGCCGTGCCCTGACCACTTCCGCTACGCGCTGCAATGCTTCCGCGCTCACCCGCTACCCGACCA TGAAGCTGCAGCACTTTCTCAAGTCGCGCATGCCGAAGGCTACGTGACGAGGCGCACCATTCTTCAAGGACGACGGCAATCAAGACACCGCGCGAGGTTG AAGTTCGAGGGCGACACCTCGTGAACCGCATCGAGTGAAGGGCATCGACTTCAAGGAGGACGGCAACATCTCGGGCACAAGCTGGAGTCAACATCAACACAG CCACAACGCTCTATATCATGCGCCGACAAAGCAGAAGACGGCATCAAGGTGAATTTCAAGATCCGCGCAACATCGAGGACGGCAGCTGACGCTCGCCGACCACT ACCAGCAGAACACCCCAATCGGCGACGGCCCGCTGCTGCTGCCGACAAACCATACCTTAGCTACACAGTCCGCTTGAAGCAAGACCCCAAGAGAGCGGAT CAGATGGTCTGCTGAGGTTCTGACCGCGCGCGGATCACTCTCGGATGGACAGCTGTACAAGTAACTCGGTACCAATTTCAAGAAAGAGGCCCTCCCGAA AGGGGGGCTTTTTTCGTTTTGTCTCAATGGCGCGCGCCATCGAATGAGTGCTTCTCGTCACTGACTCGCTGCACGAGGCA
pAJM.716 ^B	SACCTCAGCGTAGCGGAGTGTATACCTGGCTTACTATGTTGGCACTGATGAGGGTGTGAGTGAAGTGCCTTCATGTGGCAGGAGAAAAAGGCTGCACCGGTGGC FCAGCAGAATATGTGATACAGGATATATTCGGCTTCCTCGCTCACTGACTCGGTACGCTCGGTCGTTCGACTCGCGGAGCGGAAATGGCTTACGAACGGGGGCG GAGATTCTCGGAAGATGCCAGGAAGTACTTAACAGGGAAGTGAGAGGGCCGCGGCAAGCCGTTTTTCATAGGCTCCGCCCCCTGACAAGCATCACGAAA CTGACGCTCAAACTCAGTGGTGGCGAAACCCGACAGGACTATAAAGATACACAGGCGTTTCCTCGGCGGCTCCCTCGTGGCTTCTCTGCTTTCGGT TTTACCGGTGTCATTTCGGCTGTATGGCCGGTTTTGCTCATTTCCACGCTGACACTCAGTTCCGGGTAGGCAGTTTCGCTCCAGCTGGACTGTATGACGAAAC CCCGCTTCAGTCCGACCGCTGCGCCTTATCCGGTAACATATCGCTTTGAGTCCAAACCCGGAAGACATGCAAAAGCACCACTGGCAGCAGCCATGGTAATTGA TTTAGAGGAGTTAGTCTTGAAGTCATGCGCGGTTAAGGCTAACTGAAAGGACAAGTTTTGGTGACTGCGCTCCTCCAGCCAGTTTACCTCGGTTCAAAGAGT TGTAGTCTCAGAGAACCCTTCGAAAAACCGCCCTGCAAGCGGTTTTTCGTTTTACAGCAAGAGATTACGCGCAGACCAAAACAGTCTCAAGAAGATCATCTT ATTAAAGGGTCTGACGCTCAGTGGAAACGAAAAATCAATCTAAAGTATATATGAGTAAACTTGGTCTGACAGTTACCTTAGAAAACTCATCGAGCATCAATGA AACTCGCAATTTATTCATATCAGGATTATCAATACCATATTTTGA AAAAGCCGTTTTCTGTAATGAAGGAGAAAACTCACCGAGGCAGTTTCCATAGGATGGCAAG ATCTCGTATCGGCTCGGATTTCGACTCGTCCCAAGATCAATACAACTATTAATTTCCCTCGTCAAAAATAAGGTTATCAAGTGAGAAATCAGCATGAGTGA CGCATGAATCCGGTGAGAATGGCAAAAGCTTATGCAATTTCTTCCAGACTTGTTCACAGGCGCAGCCATTACGCTCGTCATCAAAATCACTCGCATCAACCAAA CCGTTATTCATCTGATGATTGCGCCTGAGCGAGACGAAATACGCGATCGCTGTAAAAGGACAATTAACAACAGGAATCGAATCAACCGGCGAGGACACTGCG CAGCGCATCAACAATATTTACCTGAATCAGGATATTTCTTAATACCTGGAATGCTGTTTTCCCGGGGATCGCAGTGTGAGTAAACATGCATCATCAGGAG TACGGATAAAATGCTTGATGGTCGGAAGAGGCAATAATCCGTCAGCCAGTTTAGTCTGACCATCTCATCTGTAACATCATTTGGCAACGCTACCTTTGCCATGT TTCAAGAAACAACTCTGGCGCATCGGGCTTCCCATACAATCGATAGATTGTCGCACTGATTGCCGACATTTATCCGAGCCCATTTATACCCATATAAATCAGC ATCCATGTTTGAATTTAATCGCGCCTCGAGCAAGACGTTTTCCCGTTGAATATGGCTCATAAACCCCTTGTATTACTGTTATGTAAAGCAGACAGTTTATTGT TTCATGATGATATATTTTATCTTGTGCAATGTACATCAGAGATTTTGAGACCAACCAATTTTGAAGGCCCTCCCTAACGGGGGGGCTTTTTTGTCTTCTGGT CTCCCGCTTAACGATCGTTGGCTGTGTGACAATTAATCATCGGCTCGTATAATGTGTGAATTTGTAGCGCTCACAATAGCTGTACCGGATGTGCTTTCCG GTCTGATGAGTCCGTGAGGACGAAACAGCCTCTACAATAATTTTGTTTAACTAGAGAAAGAGGGGAAATACTAGTGGTGAGCAAGGGCGAGGAGCTGTT ACCGGGGTGGTCCCATCTCGGTGAGCTGGACGGCGACGTAAACGGCCACAAGTTTACGCTGTCCGCGAGGGCGAGGGCGATGCCACCTACGGCCAGCTGAC CTGAAGTTTCACTGCACCAACAGCAAGCTGCCGTGCCCTGACCACTTCCGCTACGCGCTGCAATGCTTCCGCGCTCACCCGCTACCCGACCA TGAAGCTGCAGCACTTTCTCAAGTCGCGCATGCCGAAGGCTACGTGACGAGGCGCACCATTCTTCAAGGACGACGGCAATCAAGACACCGCGCGAGGTTG AAGTTCGAGGGCGACACCTCGTGAACCGCATCGAGTGAAGGGCATCGACTTCAAGGAGGACGGCAACATCTCGGGCACAAGCTGGAGTCAACATCAACACAG CCACAACGCTCTATATCATGCGCCGACAAAGCAGAAGACGGCATCAAGGTGAATTTCAAGATCCGCGCAACATCGAGGACGGCAGCTGACGCTCGCCGACCACT ACCAGCAGAACACCCCAATCGGCGACGGCCCGCTGCTGCTGCCGACAAACCATACCTTAGCTACACAGTCCGCTTGAAGCAAGACCCCAAGAGAGCGGAT CAGATGGTCTGCTGAGGTTCTGACCGCGCGCGGATCACTCTCGGATGGACAGCTGTACAAGTAACTCGGTACCAATTTCAAGAAAGAGGCCCTCCCGAA AGGGGGGCTTTTTTCGTTTTGTCTCAATGGCGCGCGCCATCGAATGAGTGCTTCTCGTCACTGACTCGCTGCACGAGGCA

	TACGGATAAAATGCTTGATGGTCGGAAGAGGCATAAAATCCGTCAGCCAGTTTAGTCTGACCATCTCATCTGTAACATCATTTGGCAACGCTACCTTTTCCCATGT TTCAGAAACAACTCTGGCGCATCGGGCTTCCCATACAATCGATAGATTGTGCGCACTGATTGCCGACATTATCCGGAGGCCATTTATACCCATATAAATCAGC ATCCATGTTTGAATTTAATCGCGGCTCGAGCAAGACGTTTCCCGTGAATATGGCTCATAAACCCCTTGTATTACTGTTTATGTAAGCAGACAGTTTATTGT TTCATGATGATATATTTTTATCTTGTCGAATGTACATCAGAGATTTTGAGACACAACCAATTATTGAAGGCCCTCCCTAACGGGGGCTTTTGTGTTCTGTGTT CTCCGCTTAAACGATCGTTGGCTGAGAAACCAATTGGCCATATTGGCATCAGACATTTGCCGTCACTGCGTCTTTTACTGGCTCTTCCGTCATCAACCAACCGGTAA CCCCGCTTATTAAAGACATTCTGTAACAAAGCGGGACCAAAGCCATGACAAAACGGGTACAAAAGAGTGTCTAATATCAGCGGACAGAAAGTGCACATTGATTAT TTGCGACGCGCTCACACTTTGCTATGCGCATAGCATTTTATCCATAAGATTCAGCGGATCCTACTGACGCTTTTATCGCAACTCTCTGACTGTTTCTCATACCC GAGCTGTCACCGGATGTCTTCCGGTCTGATGAGTCCGTCGAGGACGAACAGCCTCTACAATAATTGTTGTTAACTACTAGAGAAAGGGGAAATACTAGAT GGTGACGAAGGGCGAGGAGCTGTTACCGGGGTGGTGCCCATCTGCTCGAGCTGGACGGCGACGTAAACGGCCACAAGTTTCAGCGTCTCCGGCAGGGCGAGG CGGATGCCACCTACGGCAAGCTGACCGTGAAGTTCATCTGCACCAAGCGCAAGTGCCTGCGCTGGCCACCCTCTGTAACCACTCTCGGTACGGGCTGCAA TGCTTCGCCGCTACCCGACCACATGAAGCTGCACGACTTCTTCAAGTCCGCCATGCCCGAAGCTACGTCACGAGGCGCCACATCTTCTTCAAGCAGACGG CAACTACAAGACCCGCGCGAGGTGAAGTTCGAGGGCGACACCTGGTGAACCGCATCGAGCTGAAGGGCATCGACTTCAAGGAGGACGGCAACATCTCGGGC ACAAGCTGGAGTACAACACAGCCACAACGCTCTATATCATGGCCGACAGCAGAAAGAGGATCAAGGTGAATCTCAAGATCCGCCACAACATCGAGGAC GGCAGCTGCGAGCTCGCCGACCACTACCAGCAGAACACCCCAATCGCGCAGCGCCCGTCTGCTGCTGCCGACAAACCACTACCTTAGCTACCACTCGGCCCTGAG CAAAAGCCCCAACGAGAAGCGGATCAGATGGTCTGCTGGAGTCTGTCGACCGCGCGGGATCACTCTCGGCATGGACGAGCTTACAAGTAACTCTGGTACCA AATTTCAGAAAAGAGGCCCTCCGAAAGGGGGGCTTTTTCGTTTGGTCCAAATGGCGGCGGCCATCGAATGAGGTGCTTCTCGCTCACTGACTCGCTGCAC GAGGCA
pAJM.717 ^B	GACCTCAGCGCTACGCGAGTGTATACGGCTTACTATGTTGGCACTGATGAGGGTGTCAAGTGAAGTGTTCATGTCGGCAGGAGAAAAAGGCTGCACCGGTGGC TCAGCAAGATATGTGATACAGGATATATTCGGCTTCCCTCGCTCACTGACTCGCTAGCGTCTGGTCTGGTCTGGACTCGCGGAGCGGAAATGGCTTACGAAGGGGGG GAGATTTCTCGGAAGATGCCAGGAAGATACCTTAAACAGGGAAGTGAGAGGGCGCGGCAAGCCGTTTTCATATAGGCTCGCGCCCTCGACAGGATCAGGAA TCGAGCGCTCAAAATCAGTGGTGGCGAAACCGCAGGACTATAAAGATACACGGGCTTCCCTCGCGGCTCCCTCGTGGCTCTCTGTTCTCGCTTTCCGGTTCGCG TTTACCGGTGCTTCCGCTGTTATGGCCGCTTTGTCTCATTCACGCTGACACTCAGTTCGGGTAGGCAGTTTCGCTCCAAGCTGGACTGTATGACGCAAC CCCCGTTTCAGTCGCGACCGCTGCGCTTATCCGGTAACTATCGTCTTGAGTCCAACCCGGAAGACATGCAAAAAGCAACCTGGCAGCAGCACTGGTAATTGA TTTAGAGGATGTAGTCTTGAAGTATCGCCCGTTAAAGCTTAACTGAAAGGACAAGTTTGGTGACTGCGCTCTTCAAGCCAGTTTACTCTGGTTCAAGAGAT TGTAGGCTCAGAGACCTTCGAAAAACCGCCCTGCAAGCGGTTTTCGTTTTCAGAGCAAGAGATTACGCGCAGACCAAAACGATCTCAAGAGATCATCTT ATTAAAGGGTCTGACGCTCAGTGAACGAAAAATCAATCTAAAGTATATATGAGTAACTTGGTCTGACAGTTACTTGAAGAACTCATCGAGCATCAAAATGA AACTGCAATTTATTCATATCAGGATTATCAATACCATATTTTGAAGAGCGGTTTCTGTAATGAAGGAGAAAACTCACCAGGCGAGTTCCATAGGATGGCAAG ATCCTGGTATCGGTCTGCGATTCCGACTCGCTCAACATCAATACAACTATTAATTTCCCTCGTCAAAAATAAGGTTATCAAGTGAGAAATCACCATGAGTGAC CGACTGAATCCGGTGAGAAATGGCAAAAGCTTATGCATTTCTTCCAGACTTGTTCACAGGCGAGCCATTACGCTCGTCAATAATCACTCGCATCAACCAAA CCGTTATTCATTCGTGATTGCGCTGAGCGAGACGAATAACGCGATCGCTGTTAAAAGGACAATTACAAACAGGAATCGAATGCAACCGCGCAGGAACACTGC CAGCGCATCAACAAATATTTTCACTGAATCAGGATATCTTCTAATACCTGGAATGCTGTTTCCCGGGGATCGCATGGTGAGTACACCATGATCATCAGGAG TCGGGATAAAATGCTTGTGTTGCGGAAGAGGCATAAAATCCGTCAGCCAGTTTGTGTCGACCATCTCATCTGTAACATCATTTGGCAACGCTACCTTTGCCATGT TTCAGAAACAACTCTGGCGCATCGGGCTTCCCATACAATCGATAGATTGTGCGACCTGATTGCCGACATTATCGCGAGGCCATTTATACCCATATAAATCAGC ATCCATGTTTGAATTTAATCGCGGCTCGAGCAAGACGTTTCCCGTGAATATGGCTCATAAACCCCTTGTATTACTGTTTATGTAAGCAGACAGTTTATTGT TTCATGATGATATATTTTATCTTGTCGAATGTACATCAGAGATTTTGAGACACAACCAATTATTGAAGGCCCTCCCTAACGGGGGGCTTTTGTGTTCTGGTCT CTCCCGCTTAAACGATCGTTGGCTGTTTTCAGCAGGACGCACTGACCTCCCTATCAGTGATAGAGATTGACATCCCTATCAGTATAGAGATTGACTGAGCAGT GTCAACCGATGTCTTCCGGTCTGATGAGTCCGTCGAGGACGAACAGCCTCTACAATAATTGTTGTTAACTACTAGAGAAAGGGGAAATACTAGATGGTGA GCAAGGGCGAGGAGCTGTTACCGGGGTGGTGCCCATCTGCTCGAGCTGGACGGCGACGTAAACGGCCACAAGTTTCAGCGTCTCCGGCAGGGCGAGGGGAT GCCACTACGGCAAGCTGACCTTGAAGTTCATCTGCACCAAGCGCAAGCTGCCCTGCGCTGGCCACCCTCTGTAACCACTCTGGCTACGGCTCGAATGCTT CGCCCGCTACCCGACCACTGAAGCTGCACGACTTCTTCAAGTCCGCCATGCCCGAAGGCTACGTCACGAGCGCCACATCTTCTTCAAGCAGCAGCGCACT ACAAGACCCGCGCGAGGTGAAGTTCGAGGGCGACACCTGGTGAACCGCATCGAGCTGAAGGGCATCGACTTCAAGGAGGACGCCAACATCTCGGGCACAAG CTGAGGTACAATACAACAGCCACAACGCTCTATATCATGGCCGACAGCAGGAAGAACGGCATCAAGGTGAATCTCAAGCTCCGCCACAACATCAGGACGGCAG CGTGAGCTCGCCGACCACTACCAGCAGAACACCCCAATCGCGCAGCGCCCGTCTGCTGCTGCCGACAAACCACTACCTTAGCTACCACTCGCCCTGAGCAAG ACCCCAAGCGCAAGCGCATCAGATGGTCTGCTGGAGTCTGTCGACCGCGCGGATCACTCTCGGCATGGACGAGCTTACAAGTAACTCTGGTACCAAAATTC CAGAAAAGAGGCCCTCCGAAAGGGGGGCTTTTTCGTTTGGTCCAAATGGCGGCGGCCATCGAATGAGGTGCTTCTCGCTCACTGACTCGCTGCACGAGGC A
pAJM.944	GACCTCAGCGCTACGCGAGTGTATACGGCTTACTATGTTGGCACTGATGAGGGTGTCAAGTGAAGTGTTCATGTCGGCAGGAGAAAAAGGCTGCACCGGTGGC TCAGCAAGATATGTGATACAGGATATATTCGGCTTCCCTCGCTCACTGACTCGCTAGCGTCTGGTCTGGTCTGGACTCGCGGAGCGGAAATGGCTTACGAAGGGGGG GAGATTTCTCGGAAGATGCCAGGAAGATACCTTAAACAGGGAAGTGAGAGGGCGCGGCAAGCCGTTTTCATATAGGCTCGCGCCCTCGACAGGATCAGGAA TCGAGCGCTCAAAATCAGTGGTGGCGAAACCGCAGGACTATAAAGATACACGGGCTTCCCTCGCGGCTCCCTCGTGGCTCTCTGTTCTCGCTTTCCGGTTCGCGT TTACCGGTGCTTCCGCTGTTATGGCCGCTTTGTCTCATTCACGCTGACACTCAGTTCGGGTAGGCAGTTTCGCTCCAAGCTGGACTGTATGACGCAAC CCCCGTTTCAGTCGCGACCGCTGCGCTTATCCGGTAACTATCGTCTTGAGTCCAACCCGGAAGACATGCAAAAAGCAACCTGGCAGCAGCACTGGTAATTGA TTTAGAGGATGTAGTCTTGAAGTATGCGCCGTTAAAGCTTAACTGAAAGGACAAGTTTGGTGACTGCGCTCTTCAAGCCAGTTTACTCTGGTTCAAGAGATT GGTAGCTCAGAGACCTTCGAAAAACCGCCCTGCAAGCGGTTTTCGTTTTCAGAGCAAGAGATTACGCGCAGACCAAAACGATCTCAAGAGATCATCTT TTAAAGGGTCTGACGCTCAGTGAACGAAAAATCAATCTAAAGTATATATGAGTAACTTGGTCTGACAGTTACTTGAAGAACTCATCGAGCATCAAAATGA ACTGCAATTTATTCATATCAGGATTATCAATACCATATTTTGAAGAGCGGTTTCTGTAATGAAGGAGAAAACTCACCAGGCGAGTTCCATAGGATGGCAAGA TCTCGTGAATCCGCTCTGCGATTCCGACTCGTCCAACATCAATACAACCTATTAATTTCCCTCGTCAAAAATAAGGTTATCAAGTGAGAAATCACCATGAGTGAC TGAGTAATCCGGTGAGAAATGGCAAAAGCTTATGCATTTCTTCCAGACTTGTTCACAGGCGAGCCATTACGCTCGTCAATAATCACTCGCATCAACCAAA CGTTATTCATTCGTGATTGCGCTGAGCGAGACGAATAACGCGATCGCTGTTAAAAGGACAATTACAAACAGGAATCGAATGCAACCGCGCAGGAACACTGCC AGCGCATCAACAAATATTTTCACTGAATCAGGATATCTTCTAATACCTGGAATGCTGTTTCCCGGGGATGCGAGTGGTGAAGTACCATGATCATCAGGAT ACGGATAAAATGCTTGTGTTGCGGAAGAGGCATAAAATCCGTCAGCCAGTTTGTGTCGACCATCTCATCTGTAACATCATTTGGCAACGCTACCTTTGCCATGTT TCAGAAACAACTCTGGCGCATCGGGCTTCCCATACAATCGATAGATTGTGCGACCTGATTGCCGACATTATCGCGAGGCCATTTATACCCATATAAATCAGCA TCCATGTTTGAATTTAATCGCGGCTCGAGCAAGACGTTTCCCGTGAATATGGCTCATAAACCCCTTGTATTACTGTTTATGTAAGCAGACAGTTTATTGT TTCATGATGATATATTTTATCTTGTCGAATGTACATCAGAGATTTTGAGACACAACCAATTATTGAAGGCCCTCCCTAACGGGGGGCTTTTGTGTTCTGGTCT TCCCGCTTAAACGATCGTTGGCTGCCCTTTGTGCTCCAAAGCGAGCGCAGCGGCTCTAAAGGGGTGCGGATCTTTCAGTTCGCTCTCGGCTTTTCAGTCTT TGTGTTGGCGCATGCTGTTATTCGAAAAACCGCTGCACACTTTTGGCGACATGCTCTGATCCCTCATCTGGGGGGGCTATCTGAGGGAATTTCCGATCCGG CTCGCTCAACCAATCTCGCTTTCCAGCACTTGAACAGCGTACGCTGTCACCGGATGCTTCCGGTCTGATGAGTCTGAGGACGAACAGCCTCTACAAT AAATTTGTTTAACTAGAGAAAGGGGAAATACTAGATGTTGAGCAAGGGCGAGGAGTGTACCGGGGTGGTGCCCATCTGCTGAGCTGGACGGCGAC GTAAACGGCCCAAAGTTTACGCTGTCCGGCGAGGGCGAGGGCGATGCCACCTACGCAAGCTGACCTTGAAGTTCATCTGCACCAAGGCAAGCTGCCGTGCC CTGCCCAACCTCTGTAACCTCTCGCTACGCGCTGCAATGCTTCCGCCCTACCCGACCACTGAAGCTGCACGACTTCTTCAAGTCCGCCATGCCGAG GCTACGTCAGGAGCGCACCATCTTCTTCAAGGACGAGCGCACTACAAGACCCGCGCGAGGTGAAGTTCGAGGGCGACACCTGGTGAACCGCATCGAGCT AAGGGCATCACTTCAAGGAGGACGGCAACCTCTGGGGCACAGCTGGAGTACAATACAACAGCCACAACGCTCTATATCATGGCCGACAGGCAAGAAACGG CATCAAGGTGAATCTCAAGATCCGCCACAACATCAGGAGCGGACGCTGAGCTCGCCGACCACTACCAGCAGAACACCCCAATCGCGCAGCGCCGCTGCTGC TGCCCGACAACCACTACCTTAGCTACCACTCCGCTGAGCAAGACCCCAACGAGAAGCGCGATCAGATGGTCTGCTGAGGCTGCTGACCGCGCGGGAT ACTCTCGCATGGACGAGCTGACAAGTAACTCGGTACCAAAATTCAGAAAAAGAGGCCCTCCGAAAGGGGGGCTTTTTCGTTTGGTCCAAATGGCGGCGCGC CATCGAATGAGGTGCTTCTCGCTCACTGACTCGCTGCACGAGGCA
pAJM.947	GACCTCAGCGCTACGCGAGTGTATACGGCTTACTATGTTGGCACTGATGAGGGTGTCAAGTGAAGTGTTCATGTCGGCAGGAGAAAAAGGCTGCACCGGTGGC TCAGCAAGATATGTGATACAGGATATATTCGGCTTCCCTCGCTCACTGACTCGCTAGCGTCTGGTCTGGTCTGGACTCGCGGAGCGGAAATGGCTTACGAAGGGGGG GAGATTTCTCGGAAGATGCCAGGAAGATACCTTAAACAGGGAAGTGAGAGGGCGCGGCAAGCCGTTTTCATATAGGCTCGCGCCCTCGACAGGATCAGGAA TCGAGCGCTCAAAATCAGTGGTGGCGAAACCGCAGGACTATAAAGATACACGGGCTTCCCTCGCGGCTCCCTCGTGGCTCTCTGTTCTCGCTTTCCGGTTCGCGT TTACCGGTGCTTCCGCTGTTATGGCCGCTTTGTCTCATTCACGCTGACACTCAGTTCGGGTAGGCAGTTTCGCTCCAAGCTGGACTGTATGACGCAAC CCCCGTTTCAGTCGCGACCGCTGCGCTTATCCGGTAACTATCGTCTTGAGTCCAACCCGGAAGACATGCAAAAAGCAACCTGGCAGCAGCACTGGTAATTGA TTTAGAGGATGTAGTCTTGAAGTATGCGCCGTTAAAGCTTAACTGAAAGGACAAGTTTGGTGACTGCGCTCTTCAAGCCAGTTTACTCTGGTTCAAGAGATT GGTAGCTCAGAGACCTTCGAAAAACCGCCCTGCAAGCGGTTTTCGTTTTCAGAGCAAGAGATTACGCGCAGACCAAAACGATCTCAAGAGATCATCTT TTAAAGGGTCTGACGCTCAGTGAACGAAAAATCAATCTAAAGTATATATGAGTAACTTGGTCTGACAGTTACTTGAAGAACTCATCGAGCATCAAAATGA ACTGCAATTTATTCATATCAGGATTATCAATACCATATTTTGAAGAGCGGTTTCTGTAATGAAGGAGAAAACTCACCAGGCGAGTTCCATAGGATGGCAAGA TCTCGTGAATCCGCTCTGCGATTCCGACTCGTCCAACATCAATACAACCTATTAATTTCCCTCGTCAAAAATAAGGTTATCAAGTGAGAAATCACCATGAGTGAC TGAGTAATCCGGTGAGAAATGGCAAAAGCTTATGCATTTCTTCCAGACTTGTTCACAGGCGAGCCATTACGCTCGTCAATAATCACTCGCATCAACCAAA CGTTATTCATTCGTGATTGCGCTGAGCGAGACGAATAACGCGATCGCTGTTAAAAGGACAATTACAAACAGGAATCGAATGCAACCGCGCAGGAACACTGCC AGCGCATCAACAAATATTTTCACTGAATCAGGATATCTTCTAATACCTGGAATGCTGTTTCCCGGGGATGCGAGTGGTGAAGTACCATGATCATCAGGAT ACGGATAAAATGCTTGTGTTGCGGAAGAGGCATAAAATCCGTCAGCCAGTTTGTGTCGACCATCTCATCTGTAACATCATTTGGCAACGCTACCTTTGCCATGTT TCAGAAACAACTCTGGCGCATCGGGCTTCCCATACAATCGATAGATTGTGCGACCTGATTGCCGACATTATCGCGAGGCCATTTATACCCATATAAATCAGCA TCCATGTTTGAATTTAATCGCGGCTCGAGCAAGACGTTTCCCGTGAATATGGCTCATAAACCCCTTGTATTACTGTTTATGTAAGCAGACAGTTTATTGT TTCATGATGATATATTTTATCTTGTCGAATGTACATCAGAGATTTTGAGACACAACCAATTATTGAAGGCCCTCCCTAACGGGGGGCTTTTGTGTTCTGGTCT TCCCGCTTAAACGATCGTTGGCTGCCCTTTGTGCTCCAAAGCGAGCGCAGCGGCTCTAAAGGGGTGCGGATCTTTCAGTTCGCTCTCGGCTTTTCAGTCTT TGTGTTGGCGCATGCTGTTATTCGAAAAACCGCTGCACACTTTTGGCGACATGCTCTGATCCCTCATCTGGGGGGGCTATCTGAGGGAATTTCCGATCCGG CTCGCTCAACCAATCTCGCTTTCCAGCACTTGAACAGCGTACGCTGTCACCGGATGCTTCCGGTCTGATGAGTCTGAGGACGAACAGCCTCTACAAT AAATTTGTTTAACTAGAGAAAGGGGAAATACTAGATGTTGAGCAAGGGCGAGGAGTGTACCGGGGTGGTGCCCATCTGCTGAGCTGGACGGCGAC GTAAACGGCCCAAAGTTTACGCTGTCCGGCGAGGGCGAGGGCGATGCCACCTACGCAAGCTGACCTTGAAGTTCATCTGCACCAAGGCAAGCTGCCGTGCC CTGCCCAACCTCTGTAACCTCTCGCTACGCGCTGCAATGCTTCCGCCCTACCCGACCACTGAAGCTGCACGACTTCTTCAAGTCCGCCATGCCGAG GCTACGTCAGGAGCGCACCATCTTCTTCAAGGACGAGCGCACTACAAGACCCGCGCGAGGTGAAGTTCGAGGGCGACACCTGGTGAACCGCATCGAGCT AAGGGCATCACTTCAAGGAGGACGGCAACCTCTGGGGCACAGCTGGAGTACAATACAACAGCCACAACGCTCTATATCATGGCCGACAGGCAAGAAACGG CATCAAGGTGAATCTCAAGATCCGCCACAACATCAGGAGCGGACGCTGAGCTCGCCGACCACTACCAGCAGAACACCCCAATCGCGCAGCGCCGCTGCTGC TGCCCGACAACCACTACCTTAGCTACCACTCCGCTGAGCAAGACCCCAACGAGAAGCGCGATCAGATGGTCTGCTGAGGCTGCTGACCGCGCGGGAT ACTCTCGCATGGACGAGCTGACAAGTAACTCGGTACCAAAATTCAGAAAAAGAGGCCCTCCGAAAGGGGGGCTTTTTCGTTTGGTCCAAATGGCGGCGCGC CATCGAATGAGGTGCTTCTCGCTCACTGACTCGCTGCACGAGGCA

	TTCATGATGATATATTTTTATCTTGTGCAATGTACATCAGAGATTTTGAGACACAAACCAATTATTGAAGGCTCCCTAACGGGGGCGCTTTTTTTGTTCTGGT CTCCCGCTTAAACGATCGTTGGCTGAACTAGCAAAATGAGATAGATTTTCGGTGAACCCGGACCCCTTGCTAGGCTCGAAGAACCGAGCTGCACCGGATGTGCTTT CCGGCTCTGATGAGTCCGTGAGGACGAAACAGCCTCTACAAATAATTTTGGTTAACTAGAGAAAGAGGGGAATACTAGATGGTGACCAAGGGCGAGGAGCTG TTCACCGGGGTGGTCCCATCTCTGGTCGAGCTGGACGGCGACGTAACCGGCCAAGTTTCAGCGTGTCCGGCGAGGGCGAGGCGGATGCCACCTACGGCAAGCT GACCTTGAAGTTTATCTGCACACAGGCAAGCTGCCCGTGGCCGACCCCTGTCGACCACTTCGGGTACGGCCTGCAAGTCTTCCGGCTGACCCGACCC ACATGAAGCTGCACGACTTCTCAAGTCCGCCATGCCCGAAGGCTACGTCACGAGGCGACCACTCTCTTCAAGGACGAGCGCACTACAGACCCGCGCGAG GTGAAGTTTCAGGGCGCACCCCTGGTGAACCGCATCGAGCTGAAGGGCATCGACTTCAGGAGGACGGCAACATCTGGGCGACAGCTTACGATCAAGCTACAA CAGCCACACGCTTATATCATGGCCGACAGCAGAAAGCGCATCAAGGTGAAGTTCAAGTACCGCCACACATCAGGAGCGGACGGTGCAGCTCCGCGAGCC ACTACACGACAGAACCCCAATCGCGGACGGCCCGCTGCTGTCGCCGACACCACTACCTTAGCTACCACTCCGCGTGAAGCAAGCCCAACGAGAAGCGC GATCACATGGTCTGCTGGAGTTCTGTACCGCCGCGGGATCACTCTCGGCATGGACGAGCTGTACAAGTAACTCGGTACCAAATTCAGAAAAGAGGCTCCCG CAAAGGGGGGCGCTTTTTTCGTTTGGTCCAAATGGCGGGCGCCATCGAATGAGGTGCTTCTCGCTCACTGACTCGCTGCACGAGGCA
pAMK.106	TTTCCATAGGCTCCGCCCCCTGACGAGCATCACAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATAAAGATACCCAGCGTTTCCCGCTG GAAGCTCCCTCGTGGCTCTCTGTTTCCGACCCCTGCCCTTACCCGATACCTGTCCGCTTTCTCCCTTCGGGAAGCGTGGCGCTTTCTCATAGCTACAGCTGT AGGTATCTCAGTTCCGGTGTAGGTCTGCTTCCGCTCAAGCTGGGCTGTGTGCACGAACCCCGCTTCAGCCCGACCGCTGGCGCTTATCCGGTGAACATATCGTCTTGA GTCCAACCCGTAAGACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATAGCAGAGCGAGGTATGTAGGCGGTGCTACAGAGTTCTTGAAGTGGT GGCTTAAGCTACGCTACACTAGAAGGACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGGAAAAGAGTTTATCGATGCTTATCGCGCAACAA ACCACCGCTGGTAGCGGGTGGTTTTTTGGTTGCAAGCAGCAGATTACCGCGCAGAAAAAAGGATCTCAAAGAGATCCCTTGTATCTTTTACCGGGGTCTGACGC TCAGTGGACGAACCACTCACCTTAAGGGATTTGGTCATGAGATTATCAAAAAGGATCTTACCTAGATCCCTTTAAATTTAAATCAAGATTTTAAATCAATCT AAAGTATATATGAGTAACTTGGTCTGACAGTTACCAATGCTTAATCAGTGAGGCACCTATCTCAGCGATCTGCTTATTTTGGATTTGATTTGGCTGACT CCCGTCTGTGATAGATACTACGATACGGGAGGGCTTACCATCTGGCCCGAGTGTGCAATGATACCGCGGGACCCAGCTCACCGGCTCCAGATTATCAGCAAT AAACCGGACCGCGAAGGGCGGAGCGCAGAAAGTGGTGTGCAACTTTATCCGCTCCATCCAGTCTATTAAATTTGTCGGGAGCTAGATAGTATGCTTTCG CAGTTAATAGTTTGGCGAAGCTTGTGTCATTGCTCGAGGCATCTGGTGTACAGCTCGTCTGTTGGTATGGCTTCACTCAGCTCCGTTCCCAACGATCAAGG CGAGTTGATGATCCCCATGTTGTGCAAAAAAGCGGTGTAGCTCTTCGGTCTCGATCGTGTTCGAGAAGTAAGTTGGCCCGAGCTGTATCATCTGTTTAT GGCAGCATGCTCAATTTCTTACTGTCATGCCATCCGTAAGATGCTTTTCTGTAAGTGGTGAAGTACTCAACCAAGTCATTCTTGAGAATAGTGTATGGCGGAC CGAGTTGCTCTTCCCGCGCTCAACACGGGATAATACCGCGCCACATAGCAGAACTTTAAAGTGTCTATCATCTTGGAAAGTGTATGGAAAGCTAATCTCA AGGATCTTACCGCTGTGAGATCCAGTTCGATGTAACCCACTCGTGACCCCACTGATCTTCAGCATCTTTTACTTTTACCAGCGTTTCTGGGTGAGCAAAAA AGGAAGGCAAAATGCCGCAAAAAAGGGAATAAGGGCGACACGGGAATGTTGAATACCTACTCTTCTCTTTTCAATATTTAGAGCAATTTATCAGGGTTATT GTCTCATGACGGATACATATTTGAATGTATTTAGAAAAATAACAAAAATAGGGGTTCCGCGACATTTCCCGCAAAAGTGCACCTTCCGCGGATGACACAG AGGTGTTTTGATAGAAATGTCCGGTCAAGGTTGCCGTCAATTTGAATCCTTCTTGAATCGCGGAAGAAACATGGTACGACTTTCTTCAAGATTGCTATGCAAC AAGCGGGTTGCTTCACTCGCTTTGATTAGTATGATGATAAAAAAGACATATTTCTATACCAGAACTGTTAAAGAAAGCCCAAGGCGGAATGATTATTA CGATTATGAAAAATCTGATTTCAATGGCTCCTTTGATCTATCTGATGGCATACAGGCGGACGACAAATATTTTCGGTTTAAAGTAAGCAGAGTACCTTTG CTTTTATGAAAAATCTATGAACAAGCAGAAAAAGTATAACATTCGGTTAGAAGAACTAGCGATTGGAATCGTTATGAAATTCGGGCTTAAATGATGCTGAC AAGTGGCGATAGATGCTTTATTGAAACAAAGGATTAACTTAAATCGCTATGACAGATCATTAAATACATGTAAAGTTTCGTTGATGCTGATGAAACATCACT AGAGACGATTGGAAACAGAGCCTTTTTTGGTCTGATTTTATAGCGGATGTTGGGAGACTTCTTTTACGTCAAAACCAAAAAAGACTTCTATCAGAAATCAAG AACTGGCTCTGTAACCTCTGTGCTCCGATGAAAAATGGTGTGAAAGCTGATGAACATTTAGGGAAGAACGATCTGATGTCAGATGTCAGAGCTGAAC TGCTGACAAACATAAAAAATGTTAGATGTGATATAGGCTGATGTGCTGACATGGTCTGTTAAACCAAGCTGCTAAACCTTAAATACACAGGATGATGGCA TTAAACGTATGTGTCAACGGTACCGGAACGAGTGAAGTAAAGGATGACATATTACGGCTTACCCAAACCCCTTTCGGATTAACCAACACAGCTTTGTTC TGCTTACCGCGGAGGAGTCCCCGATGATTCGGGGGAATAGGGGATAGATTAAACAGCAATCCACAGAGTACCGCTTGTGGGTTTGGGTGAAACCCAGAAC TAACTTGGAGGGAATAAGACTAGTCCCTCTCATCTCTTCTGCTTGGTATCTTTTAAATATGGCGCTTATGATAGTAAATCTCTGATAAGTCCAA TTCTCGTTTTCATACCTCGGTATAATCTTACCTATCACTCAAATGGTTCTCTAGAGTGCAGAAATTAACAGCTAGAAACCGCATGAGAAAGCCCCCGAAGAT CCGTTCCCGGGGCTTTTTTATTGGCTCTCTTGGCCCTCCATCCTTAGATAGTTTCAGCCAAAAAATTAAGACCGCGGCTTGTCTGACTACCTTGTGAGTAATG CAGGTGACAGGATCGCGGCTTTTTCTTCTCTCTCAATCATAGGCAATAGATGCAATGCTGCTTAATACGACTCACTATAGGGGAATTTGAGCGGATTAACAT TATTTCTGAGACCGCGCGCTTTACGGCTAGCTCAGTCTTAGTACTATGCTAGCAAGGTAGCTGTCACCGGATGTGGTTTCGGGCTGTGATGAGTCCGTGAGGA CAACACGCGCTTCAAAATAATTTTGTGTTAAACACAGGAAGTACTAGTAGCAAGGAGAAGAACTTTTCACTGGAGTGTCCCAATTTCTGTTGAATT GTAGTGTGATTTAATGGGCAAAATTTCTGTCGGTGGAGAGGTTGAAGTGTGCTACAAACGGAAGAACTACCCCTTAAATTTATTTGCACTACTGGAAACT ACCTGTCTCCGTGGCCAACTTGTCACTACTCTGACCTATGGTGTTCATGCTTTTCCCGTTATCCGGATCAGATGAACGGGATGACTTTTCAAGAGTGCCA TGCCCGAAGGTTATGTACAGGAACGCACTATATCTTTCAAAGATGACGGGACCTACAGACCGGTGCTGAAGTCAAGTTTGAAGGTGATACCCCTGTTATCTGCT ATCGACTTAAGGCTATTGATTTTAAAGAACATGCAAACTCTTTCGACACAACTCGACTCAACCTTTAACTCAACACATCTATACATCAACGACCAACAA AAAGATGGAATCAAGCTAACTTCAAAATTCGCCCAACAGTTGAAGATGGTTCCGTTCAACTAGCAGACCAATATCAACAAAATCTCCAATTTGGCGATGGCC CTGTCCCTTTACAGACAAACCTTACCTGTGCACACAACTGTCTCTTTCGAAAGATCCCAACGAAAGCGTGACCACTGGTCTCTTGTAGTTTGTAACTGCT CTGGGATTTACCATGGCATGGATGAGCTCTCAAAAATAACTAGAGCCAGGCAATCAAAATAAACGAAAGGCTCAGTCGAAAGACTGGGCTTCTGTTTATCT GTGTTTGTTCGGTGAACGCTCTCTACTAGAGTCACACTGGCTCACCTTCGGGTGGGCTTTTCTGCGTTTATAGGTCCTCACTCGAAAAAAGCCCCCGCCCTGA CAGGCGGGGTTTTTTTTTGGATTTCTCCGACCTAATTTAATCCATTTGTTGTAACATTTTCAATATATATACATAGACTCCCTTATCTAACTACTT ATTTTAAAGCAGTCTGGATTGTTTGGGTAATTCATAAAAAATAAAAGAAAGAGGGAATAGCAAAATTTGGTACATTTATACAGTATTTTCTCATACCT ACTCTCTTGTATAAAAAATGGAGATTCTTTACAAATATCGCTCTACGTCTTATTTTAAAGTATCTTATTTAAAGAGGATTAATAAATTTTGGCAAGGTTAT ATTAATAAACTGTCAATTTGATAGCGGGAACAAATAATTTGATGTCCTTTTTTAGGAGGCTTAGTTTTTTGATCCAGTTTAAAGATACCTTTATCATGTGA TCTCAAAGTATCCGGAAGATATCTGTATGCTTTGTATGCCTATGGTTATGCAATAAAATCCAGTGATAAGAGTATTTATCACTGGGATTTTATGCGCTTTTG GGCTTTTGAATGGAGAAATACATGAAATTTAATATTTGAGTTTGTAGCTATGTTGATGAGGAAAGAACCTACCTTAAACAGAAAGCTTATATATACAG TGAGCGGATACAGAAATAGGAAGCGTGGACAAAGTACACGAGGACGGATAATACGCTTTTAGAACGTCAGAGAGGAATTAACATTTACAGACGGAATAACCT CTTTTCAAGTGGGAAAAATACGAAGTGAACATCATAGACAGCCGAGGACATATGATTTCTTAGCAGAAGTATATCGTTCATTAATCAGTTTGGCAGGAAATAAT CTACTAGTTTCTGCAAAAGATGGCGTCAACGACAACTCGTATATTTATTCATGCACTTAGGAAATGGGGATCCCAACAATCTTTTATCAATAGATATGA CCAAATGGAATTTGATTTATCAACGGTTTATCAGGATTTAAAGAGAAACTTTCTGCGGAAATTTGAATCAACAGAGAGTGAAGCTGTATCTCATATGTGTG TGACGAACTTTACCGAATCTGAACAAATGGGATACGCTAATAGAGGGAACGATGACCTTTTAGAGAAATATATGTCGGGTAATCATTAGAAGCATTTGGAACCT GAACAAGGGAAGGCAATAGATTTCAAGATTTGTTCTCTGTTCCCTTTTATCATGGAAGTGCAAAAAGTAAATAGGGATGATAACCTTATAGAGTTTATTAC TAATAAATTTTATTCATCAACACATCGAGTCCGCTGCAAGTTTCGGGAAATGTTTTCAAAATTTGAATATACAAAAAAGAGCAAGCTTTGATATACCGC 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	TTAACGAGAAAGCTTTATTATATAACAGTGGAGCGATTACAGAAATAGGAAGCGTGGACAAAGGTACAAAGGAGGACGGATAATACGCTTTAGAACGTCAGAGAGG AATTCAACCTTCAGACAGGAATAACCTCTTTTCAGTGGGAAAAACGAAAGGTGAACATCATAGACACGCCAGGACATATGGATTTCTTAGCAGAGTATATCGTT CATTATCAGTTTATAGATGGGCAATTTCTACTGATTTCTGCAAAAGATGGCGTACAAGCACAACCTCGTATATATTTTCATGCACTTAGGAAAAATGGGGATTTC ACAATCTTTTTTATCAATAAGATTGACCAAAATGGAATTGATTATCAACGGTTTATCAGGATATTAAGAGAACTTTCTCGCGAAATTTGTAATCAACACAGAA GGTAGAACGTATTCCTAATGTGTGTGTGACGAACCTTACCGGAATCTGAACAAATGGGATACGGTAATAGAGGGAAACGATGACCTTTAGAGAAATATATGTCCG GTAATTCATTAGAAGCATTGGAACTCGAACAGAGGAAAGCATAGAGTTTCAGAAATTTCTCTGTCTCCCTCTTTATCATGGAAGTGCAAAAAGTAATATAGGG ATTGATAACCTTTATGAAGTTTATTACTATAAATTTTATTCATCAACACATCTGAGGTCCGTCTGAACCTTTGCGGAAATGTTTTCAAAATTTGAATATACAAAA AAGACACAGCTCTTGCAATATATACGCCCTTTATAGTGGAGTACTACATTTACGAGATTTCGGTTAGAGTATCAGAAAAAGAAAAATAAAAGTTACAGAAATGTATA CTTCAATAAATGGTGAATTATGTAAAGATTGATAGAGCTTATCTCGAGAAATGTTTATTTGCAAAATGAGTTTGTGAAGTAAATAGTGTCTTGGAGATACA AAACTATTGGCCACAGAGAAAAAGATTGAAAATCCGCAACCTCTACTACAAACACTGTTGAACCGAGTAAACCTGACAGAGAGAAATGTGCTTGTATGCCCT TTTGCAAAATCTCAGATAGTGCATCCGCTTCTACGATATTACCTGGATTCTACGACACATGAAATTTATCTTTCTTCTTAGGAACTCAGAAATGAAATGATTA GTGCACTGTTGCAAGAAAAGTATCATGTGGAGATAGAACTAAAAGAGCTACAGTCATTATATGGAGAGGCCGTTAAAAATGCAAGATATACCATTCACATC GAAGTGGCCGCCAAATCCTTTCTGGGCTTCCATTGGTTTATCTGTATCAGCGCTTCCGTTGGGAAGTGGAAATGAGTATGAGAGCTCGGTTTCTTCTGGATACTT AAATCAATCATTTTCAAAATGCAAGTTATGGAAGGATACGCTATGGTTGTGAACAAGGATTGTATGGTTGGAATGTGACGAGCTGTAAAAATCTGTTTAAATATG GCTTATACATATAGCCCTGTTAGTACCACAGCAGATTTCGGATGCTTGCTCCTATTGTATTGGAACAAGCTCTAAAAAAGCTGGAACAGAAATTTGTAGAGCCA TATCTTAGTTTAAAAATTTATGCGCCACAGGAATATCTTTCACGAGCATCAACGATGCTCCTAAATATTGTCGCAACATCTAGACACTCAATTGAAAAATAA TGAGGTGATCTTCTAGTGAGAAATCCCTGCTCGGTGATTACAGAAATCTGATAGTGATTAACTTTCTTTACAAATGACGAGTGTGTTTAAACAGAGTTAA AAGGTCACCATCTTACTACCGGTGAACCTGTTTGCACGCCCGCTGCTCCAAATATGTCGATAGATAAAGTACGATATATGTTCAATAAATAACTTAGTGTATT TTATGTTGTATATAAATATGTTTCTGTTAAATAGATGAAATATTTTTTAAATAGATTGAATTAAGTGTCCGCAATAGTTACCCCTTATTATCAAGATA AGAAAGAAAAGGATTTTTCGCTACGCTCAAAATCCTTTAAAAAACAACAAAAGACCACATTTTTTAAATGTGCTTTTATTTCTTCAACTAAGACCCCATTAGTT CACACAAACGAAAAATTTGGATAAAGTGGGATTTTTTAAATATATATTTTATGTTACAGTAATATTGACTTTTTAAAAAAGGATTGATTTCTAATGAAGAAGCAGAC AAGTAAAGCCTCTAAATTCACCTTAGATAAAAAATTTAGGAGGCATATCAAATGAACCTTTAATAAAATTTGATTAGACAAATTTGAAGAGAAAAGAGATATTTAAT CATTTATTGAACCAACAAACGACTTTTAGTATAAACCACAGAAATTTGATATTAGTGTTTTATACCGAAACATAAAACAGAAAGGATATAAATTTTACCGTCGATT TAATTTCTTAGTGACAAAGGTTGATAAACTCAAAATACAGCTTTTAGAAGCTGGTTACAAATAGCGACGGAGAGTTAGGTTATTTGGGATATAGTATAGAGCCACTTTATA CAATTTTGTAGTGTGTATCTAAACATTTCTCTGGTATTGGACTCCCTGTAAGAATGACTTCAAAAGAGTTTATTGATTATTAAGTATAGTATAGAGAAATAT AATGGTTTCGGGAAATTTGTTTCCCAAAACCTTATACCTGAAATGCTTTTTCTCTTCTATTATTCCATGGACTTCAATTTACTGGGTTTAACTTAAATATCAA TAATAATAGTAAATACCTTCTACCCATTATTACAGCAGGAAAAATTCATTAATAAGGTAATTCATATATTTTACCGCTACTTTACAGGATCAATCTCTGTTT GTGATGGTTTATCATGCAAGGATTGTTTATGAACCTATTACGGAATTTGCAAGTAGGCCATAATGACTGGCTTTTATAATATAGAGATAATTCGCGATCATCTTTT ACAGTCGGTTGCTCAATGTCACTAACCTGCCTTAGATAAATTTGAAGAAGTACATCCGCAACTGCTCACTACTCTGATGCTTAGAGGATCCCCGGGTACCGAGCTC GAATTCGCTATTTTTATATCCATAGTTGTTAAATAAATAAACTTAATTTAGTTTATTATAGATTCTATTGGCTTCTAATTTCTAGATATAATATTTATT TAGTTAAATTTTATTCTAGATTATATATGATATGATCTTTCATTCCATAAAATCAAGTAAGTGAATCAACCTATTCTATTGTTTAAAGATATCTCTTGCCAGTA CGTTAGCTTTTAGTTTAGTTTATTAACATGTATTTCAGCAAGCAAAATCGCCATTTCGCGAGGCTGCAGGAATTCACGATCTCTCAAGTTTCTAGGTAGGACATCAATA AAGCAAGGCTCAGTCGAAAGACTGGGCTTTCTGTTTATCTGTTGTTGTCGGTGAACGCTCTCCTGATAGGACAAATCCCGCGCTCTAGCTAAGCAGAAAG CCATCTCAGCGGATGGCCTTTTTGCGTTTCTACAACTCTTGTTAACTCTAGAGCTGCTGCGCGCTTTCGGTGATGAAGATCTTCCCGATAGTAAATTAATTC AGAAGCCTCGGTTGCGCGCGGCGGTTTTTATGCAAGATGGCAAGACGTTGCTCGAGGTAATGTGAGCACTCAACATTCATTTTGAAGAAAGTATTTAGAA AGATTACTATATCTTCAACAGGCGGTAAACCGGCTTTCATCGGGAATGCGCGGACCTTCAACATCGCGCGATGTCCCCCTGGCGGACGGGAAGTATCCAG CTCGAGGTCGGGCGCGTTGCTGGCGTT
pCAV.5063	FGATTGCGACGGGCCATGGGTAAATPCCATGTGACGCGTTAAGTGTTCCTGTGTCACATAAAATTTGCTTTGAGAGGCTCTAAGGGCTTTCTCAGTGGTTACAT CCCTGGCTTTGTTGTCACAACCGTTAAACGTTTAAAAGCTTTAAAAGCCTTATATATTTCTTTTTTTTCTTATAAAACTTAAAAGCTTAGAGGCTAATTAAAGTTG FGATTATATAAATTTTATGTTCAAACTAGAGAGCTTAGTACGTGAACATGAGAGCTTAGTACGTTAGCCATGAGAGCTTAGTACGTTAGCCATGAGGCTTT AGTTCGTAAACATGAGAGCTTAGTACGTTAAACATGAGAGCTTAGTACGTGAACATGAGAGCTTAGTACGTAATAACAGGTTGAACCTGCTGATCTTCAG ATCCTCAGCGCGGACGATCGTGGCGGATCTTCTGTGTTGAAATCTCACAATAAAAAACGCCGCGCGCAACCGGATCTTGACAACTTCAACATTT AATAAAAAAGGCGCGTGCAGAGATCGCCCTTTTTTACGTATGACACCTCGCTCAACCAAAAGCAATCAACAGTGAATAATGGCGCCATCGGCGCATTTTT TTATGGTTCTTTATCATCTGGCGAATCGGATTGACAGCTTATCATGATAACTGTAAATGCGGTAGTTTATCAGCTTAATTTGATACAGCATCAGGCACTTT GTATGAATTTCAACAAATGCGCTCATCGTCACTCTCGGACCGCTCACCTCGGATGCTGTAGGATAGGCTTGGTTATGCGCGTACTGCGCGGCTCTCTGGGAT ATGCTCCATTCGACAGCATCGCCACTCACTATGGCGTCTGCTAGCGCTTATGCGCTTGTATGCAATTTCTATGCGCAGCGCTTCTCGGAGCATCTCGGACCG CTTTGGCGCGCGCCAGTCTGCTCGCTTCGCTACTTGGAGCCACTATCGCACTACGCGATCATGGCGACCAACCCGCTCTGCGGATCTCTACGCGCGACGCA TCGTGGCGCGCATCGCGCGCCACAGGTGCGGTTCTGCGCGCTATATCGCGCACATCCGATGGGGAAGATCGGCTCGGACTTCGCGCTCATGAGCCT FGTTTTGCGGCTGGGTATGGTGGCAGGCGCGCTGGCGGGGGAGCTGTGGGCGCCATCTCCCTGCACGCACCATCTCTTGGCGGCGCGGTGCTCAACGGCCTCAA CCTACTACTTGGGCTGCTTCCATATGCAAGAGTCGATTAAGGAGAGCGCGCTCGCATGCCCTTGAGAGCTTCAACCCAGTACGCTTCTCGCGTGGCGCGGG GCATGACCATTTGTGGCCGCACTTATGACTGTCTTTCTTATCATGCAACTCGTATAGGACAGGTGCGCGAGCGCTCTGGGTGATTTCTGCGCAGGACCGCTTTTCG TGGAGCGCGAGATGATCGGCTGTGCTTTCGGGTATTCGGAATCTTGACGCGCTCTGCTCAAGCCTTCTGCTACTGGTTCGCGCGCAACCAATAGTTTCTCGGCT CGAGGCGCATTATCGCGCGCATGGCGCGGACGCGCTGGCTGCTGCTGCGGCTTCGCGAGCGAGGCTGGATGGGCTTCCCATATGATTCTTCTTAGGCT CTGCGGGCATCGGGATCGCCGCTTGAGGCGCATGCTGCTCAGGCAAGTAGATGACGACCATCAGGAGCAGCTTCAAGGATGCTCTCGGCTTCTTACCGCTTA ACCTGCGCATCGACCGCTGATGCTCAGCGCATTTATGCGCGCTTCGCGCGCACATGGAACCGGTTGGCATGGATTGTAGGCGCGCCCTATACCTTTGTCTG CCTCCCGCGTTCGCTCGCGTGCATGGAGCGGGCCACCTCGACCTGAGACAATGTCTAATTAATTGCGGACCTTAGAGGTCCTTTTTTATTTAAAAAT TTTTTCAAAAGCGGTTTACAAAGCATAAATCTCTGAGAAGTTCCTATTTCGGAAGTTCCTATTCTCTAGAAAGTATAGGAATCTCGGATCCGAATTCGAGCTCC GTGCAACATATGTCGGCGCACTCGAGGCTCTTTCAGTCTAGCTCAGTGTAGCTAGCTAGCTAGCGAAGCAATCTATGAAAAACATAA ATCGCGACGACATACAGAAATTAATAAAATTAAGGCTTTTGAAGCAATTAATGATATTAATCAATGCTTATCTGATATGACTAAATGTTACATTTGTGA TATTATTACTCGGATCATTTATCTCTATTTATGGTTAAATCTGATATTTCAATCTAGATAATTACCTAAAAATGAGGCAATATTATGATGACGCTAA TTTAAATAAATATGATCTTATAGTAGATTATTTAACTCCAATCATTCACCAATTAATTTGGAATATATTTGAAACCAATGCTGTAAATAAATGCTTCCAAATG TAATTAAGAAGCGAAAAACATCAGGTTTATATCAGTGGTTTGTGTTTCCCTATTATCATAGCTTAAACATGGCTTCGGAATGCTTAGTTTGTCAATTTCAAGAA GACAACATATATAGATAGTTTATTTTACATCGCTGTATGAACATACCATTAATTTGTTCTTCTCTAGTTGATTAATTTCAAAAAATTAATATAGCAATATATA ATCAACCAACGATTTAACCAAAAGAGAAAAAGATGTTTAGCTGGGATGCGAAGGAAAAAGCTCTTGGGATATTTCAAAATTAATTAGATGAGTGCAGCGTA 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GGTTGACGCTTTTCTTGAGCTGGAACGCTCAAGTGGAATAATTTGAGTTGAGCGGCATCTGCGAGAAGATGGCGAGCGACCTCGGATCTCGAAGATCTGTTG GCCGTGTGCTTAAGGACAGCGCAGACTACGAGAAGCCCTTATCTGTCAGCAACTACCCGCGCGCTTGGCGCGAGCATACGACCACTGGCTACGCGCGGGT GACCCGAGCGTCACTGTACCCAGAGCGTACTGCGGATTTTCTGGGAACCGCCATCTACCAGACGCGAAAGCAGCAGGTTCTTCGAGGAAGCTTGTGC CGCTGGCTGGTGTATGAGTACCATGCGCGTGCATGGTGTGCGCGCGCACTCGGCGCGCTGAGGCTCAGCGTGAAGCGGAAACCGCGCGGAGGCGCAAC CTTTATGAGACTCGCTCTCGGACCGCTGTGATGCTCAAGGACTACGCACTCGACAGCGCTGTCGGAATCGCCTTCAAGACTTCGCACTCAACCAACCGGCTGCT CTGACCGCGGAGAGAAGGAGTGTACAGTGGTGGCCATCGGCAAGCAGCAGTGGGAGATATCGGTTATCTGCAACTGCTCGGAAGCCAATGTGAACCTCCA TATGGGAAATATTTCGGCGGAAGTTTCGGTGTGACCTCCGCGCGGTAGCGGCCATTTAGCCGTTAAATTTGGGCTTATTTACTCTGTATAATGGCAACATAAG GAGGTGTTCTTATGATTGTGGGTGAAGATCAGCTCTGGGCTGCTGTACACTGGAATTTGTTGATAGCTGTGAACGCTTCGGAAGCAGCGCATGATTGCGC TTTTGAAAGCGCTGATTGAAGCTGTGGTTTACCGCCTATATCATGGCAGGCTCGCGAGCGGTAATGCGGCTTCGCGGAATGACCTTGGCAATGGTTGGC 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ATGACCGTTTCCCGCTGGTGAACACGCGCAGCCAGCTTTTCTGCGAAACCGGGGAAACTGGAAGCGCGGATGGTGGAGCTGAATTTACATTTCCCAACCGGCT GGCACAACCACTGGCGGCAACAGTCGTTGCTGATTGGCTTGCACCTCCAGCTTGGCCCTGCAACGCGCGCTGCGAAATTTGTCGCGGCAATTTAAATCTCGCG CCGATCAACTGGGTGCCAGCGTGGTGGTGTGATGCTGAGACGAAGCGCGCTCGAAGCTGTAAGCGCGGCTGCAACAATTTCTCGCGCGCAGCGCTAGTGG CTGATCACTAATCTCGCTGGATACGAGATGCTGCTGGGAAGCTGCGTGCACATAAGTTCGCGGCTTATCTGATGCTCTGACGACGACCGAT

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	AATAACCCTGATAAATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCGTGTGCGCCTTATTCCCTTTTTTGCGGCATTTTGCTTCCT ETTTTTTGCTCACCAGAAACGCTGGTGAAAGTAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTACATCGAACTGGATCTCAACAGCGGTAAGATCCT TGAGAGTTTTCGCCCGAAGAACGTTTCCCAATGATGAGCACTTTTAAAGTCTGCTATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGAGCAACTCG STCGCCGCATACACTATTCTCAGAAATGACTTGGTTGAGTACTCACCAGTCACAGAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCCTGCC ATAACCATGAGTGATAACACTGCGGGCCAACTTACTTCTGACAACGATCGGAGGACCGAAGGAGCTAACCGCTTTTTGCACAACATGGGGGATCATGTAACCTG CCTTGATCGTTGGGAACCGGAGCTGAATGAAGCCATACCAAACGACGAGCGTGACACCACGATGCCGTAGCAATGGCAACAACGTTGCGCAAACTATTAACTG GCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGACTGGATGGAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTCCGGCTGGCTGTTT ATTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACTGGGGCCAGATGGTAAGCCCTCCCGTATCGTAGTTATCTACACGACGGG GAGTCAGGCAACTATGGATGAACGAAATAGACAGATCGCTGAGTAGGTGCTTCACTGATTAAAGCATTGGTAACTGTACAGCAAGTTTACTCATATATACTTT AGATTGATTAAAACTTCATTTTAAATTTAAAGGATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCCTTAACGTGAGTTTTCGTCCACTGA CCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTTTCTGCGCGTAATCTGCTGCTTGCAAAACAAAAACCACCGCTACACGCGTGGT TTGTTTGCCGGATCAGAGCTACCAACTCTTTTTCCGAAGGTAACCTGGCTTCAGCAGAGCGCAGATACCAAACTACTGTCCTTCTAGTGTAGCCGTAGTTAGGCC ACCACCTCAAGAACTCTGTAGCACCGCCCTACATACCTCGCTCTGCTAATCCTGTTACCAG
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^A Annotations: Promoters; Ribozymes; CDS; Terminators; RBSs; Antibiotic resistance gene; origin of rep

^B Reported in (Meyer *et al.*, 2019); ^C Reported in (Park *et al.*, 2020)

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