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**Supplemental Information**

**Circular Concatemers of Ultra-Short**

**DNA Segments Produce Regulatory RNAs**

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REAGENT or RESOURCE	SOURCE	IDENTIFIER
crypIESa sequence 5' TATAGGCATATAGAATAAGCAAATCTATA 3'	This work, synthesised by Microsynth (Switzerland)	N/A
crypIESb sequence: 5' TATAGGTTTGCTTCTATGATGAAACTATA 3'	This work, synthesised by Microsynth (Switzerland)	N/A
crypIESc sequence: 5' TATAGGCTTTGAATAAGATTATCACTATA 3'	This work, synthesised by Microsynth (Switzerland)	N/A
crypIESa F primer to check excision 5' GCTGTGATGAAGTTTGAGATGC 3'	This work, synthesised by Microsynth (Switzerland)	N/A
crypIESa R primer to check excision 5' TAAGGTTGTGGGGCAGCTAT 3'	This work, synthesised by Microsynth (Switzerland)	N/A
crypIESb F primer to check excision 5' AAAGGTCATGCTAATGCTGT 3'	This work, synthesised by Microsynth (Switzerland)	N/A
crypIESb R primer to check excision 5' ATCTCCACTACAGGATGCAA 3'	This work, synthesised by Microsynth (Switzerland)	N/A
crypIESc F primer to check excision 5' TTGTTTTGGCCAATTCATCC 3'	This work, synthesised by	N/A

	Microsynth (Switzerland)	
cryptIESc R primer to check excision 5' ATTAATTCATGCAGTGCGTC 3'	This work, synthesised by Microsynth (Switzerland)	N/A
<i>Dcl5</i> sensitive IES to check silencing efficiency: IESPGM.PTET51.1.137.127377	This work, synthesised by Microsynth (Switzerland)	N/A
F primer to check excision of IESPGM.PTET51.1.137.127377 5' GCCATAACAATTATTACCTCCATAACAATCTTACATG 3'	This work, synthesised by Microsynth (Switzerland)	N/A
R primer to check excision of IESPGM.PTET51.1.137.127377 5' CTCATTTAATCCATCATCCTATTCTTCCTCCTG 3'	This work, synthesised by Microsynth (Switzerland)	N/A
<i>Ligase IVa</i> F primer 5' GTCATTCAATTATATTTGAAGTT AAA GCT GC 3'	This work, synthesised by Microsynth (Switzerland)	N/A
<i>Ligase IVa</i> R primer 5' GGGGTACCCAGTTTCATTTTTTCATATT ATC A 3'	This work, synthesised by Microsynth (Switzerland)	N/A
<i>Ligase IVb</i> F primer 5' ATAATCCAGCTCATTCAATTATATTTG AAGTTAAAGC 3'	This work, synthesised by Microsynth (Switzerland)	N/A

Ligase IVb R primer 5' GGGGTACCAGGTTTCATTAATTTTCATA TTATCG 3'	This work, synthesised by Microsynth (Switzerland)	N/A
Primer on IES A Forward 5' GGATTCTCTGAACATCAAGTG 3'	This work, synthesised by Microsynth (Switzerland)	N/A
Primer on IES A Reverse 5' CCATCCCATTTTGTATGTCAAG 3'	This work, synthesised by Microsynth (Switzerland)	N/A
Primer on IES B Forward 5' GTTACTCCGATTGCAACCAC 3'	This work, synthesised by Microsynth (Switzerland)	N/A
Primer on IES B Reverse 5' CACTGAAGTGAGAGAGTCTACTG 3'	This work, synthesised by Microsynth (Switzerland)	N/A
Primer on IES C Forward 5' GGTACTCAATAAGACCTTAATTC 3'	This work, synthesised by Microsynth (Switzerland)	N/A
Primer on IES C Reverse 5' CTCCGAATGATATAAATTATAGG 3'	This work, synthesised by Microsynth (Switzerland)	N/A
Primer on IES D Forward 5' AATACAATGACGGTAGTGCTG 3'	This work, synthesised by	N/A

	Microsynth (Switzerland)	
Primer on IES D Reverse 5' CGACTATCACGAGATGACTG 3'	This work, synthesised by Microsynth (Switzerland)	N/A
Primer on IES E Forward 5' GTTCTCCATATTTATTAGTTCAAGAG 3'	This work, synthesised by Microsynth (Switzerland)	N/A
Primer on IES E Reverse 5' TTTAATACTAGATAATTGCTAGCTG 3'	This work, synthesised by Microsynth (Switzerland)	N/A
LigIVa silencing construct (circular) AACCTGGCTTATCGAAATTAATACGACTCACTATAGGG AGACCGGCAGATCTGATATCATCGATGAATTCGAGCTC CACCGCGGTGGCGGCCGCTCTAGAAGTAGTGGATCCAC CGTTCCATGGCTAGCCACGTGACGCGTGGATCCCCCG GGCTGCAGAAATCACAAAGTCTAATACTTTTCCAAGT ATTACACTCTTAGATTTCCACGATGTTACAAGACAAGAA TGGATAAAGACTGGTATGAAATGATGACCACGCAAGAT TTATCAAGTATGATCAATGACTCATAATACACTAAGAAT CTCAAAAAAAAAAGAACGATAAAGAAGGCAATGATAAATA AACAGACGATGAGGTTGAAAATGAGGATAGACCTATTA GATAGGCTAAATAGAGAAAATAACCCTTAAAGAAAGGT GGAGCTCATTCTAAATAGATTACCATAATGACTGAATTT CAAGGATTAGATCCAAGAAACATCACAAAAGAATCCAA CCTATTTGTAGGATGCGAATTTTTTATTGTGAATTTAG AAGAAGATTATAATAAATAATATTTAGAATCTATAGTTC TAGCCCAAGGAGGAAGTTGTATATAAAATTACATTGTA GAAAGTGTCACCTCATGTAGTGGCTTCGATTATAGATTT TAGAGTGAATTCATTATTGAGAAGTTCCTACTACTAT CATCAGACCATAATGGATAATTGAATGCATTAGAAGAT CATAATTAGTTAATATTGCACCTAGATTTATTTTGTGTTG CCCCTAGCCATCATGAATGAAGTCAATAAATTCTATG ATAGGTTTGGTGATTCCTATTTTGAATTGATTGACGAT TTGGCTCTCAAAGATATCTGTGATAATATGAAAATTAAT GAAACTGGGTACCCAATTCGCCCTATAGTGAGTCGTAT TACGCGCGCTCACTGGCCGTCGTTTTACAACGTCGTGA	This work, generated using primers described above	N/A

CTGGGAAAACCCTGGCGTTACCCAACCTTAATCGCCTTG  
CAGCACATCCCCCTTCGCCAGCTGGCGTAATAGCGAA  
GAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAG  
CCTGAATGGCGAATGGGACGCGCCCTGTAGCGGCGCA  
TTAAGCGCGGCGGGTGTGGTGGTTACGCGCAGCGTGA  
CCGCTACACTTGCCAGCGCCCTAGCGCCCGCTCCTTTC  
GCTTTCCTCCCTTCCTTCTCGCCACGTTGCGCCGGCTT  
CCCCGTCAAGCTCTAAATCGGGGGCTCCCTTAGGGTT  
CCGATTTAGTGCTTACGGCACCTCGACCCCAAAAAC  
TTGATTAGGGTGATGGTTCACGTAGTGGGCCATCGCCC  
TGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCAC  
GTTCTTTAATAGTGGACTCTTGTTCCAACTGGAACAA  
CACTCAACCCTATCTCGGTCTATTCTTTTGATTTATAAG  
GGATTTTGCCGATTTTCGGCCTATTGGTTAAAAAATGAG  
CTGATTTAACAAAAATTTAACGCGAATTTAACAAAATA  
TTAACGCTTACAATTTAGGTGGCACTTTTCGGGGAAAT  
GTGCGCGGAACCCCTATTTGTTTATTTTTCTAAATACAT  
TCAAATATGTATCCGCTCATGAGACAATAACCCTGATAA  
ATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTAT  
TCAACATTTCCGTGTCGCCCTTATTCCCTTTTTTGCGGC  
ATTTTGCCTTCTGTTTTTGTCTACCCAGAAACGCTGG  
TGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCACGA  
GTGGGTACATCGAACTGGATCTCACAGCGGTAAGAT  
CCTTGAGAGTTTTCGCCCCGAAGAACGTTTTCCAATGA  
TGAGCACTTTTAAAGTTCTGCTATGTGGCGCGGTATTA  
TCCCGTATTGACGCCGGCAAGAGCAACTCGGTGCGCCG  
CATACTATTCTCAGAAATGACTTGGTTGAGTACTCAC  
CAGTCACAGAAAAGCATCTTACGGATGGCATGACAGTA  
AGAGAATTATGCAGTGCTGCCATAACCATGAGTGATAA  
CACTGCGGCCAACTTACTTCTGACAACGATCGGAGGAC  
CGAAGGAGCTAACCGCTTTTTTGCACAACATGGGGGAT  
CATGTAACCTCGCCTTGATCGTTGGGAACCGGAGCTGAA  
TGAAGCCATACCAAACGACGAGCGTGACACCACGATGC  
CTGTAGCAATGGCAACAACGTTGCGCAAATTAAT  
GGCGAACTACTTACTTAGCTTCCCGGCAACAATTAAT  
AGACTGGATGGAGGCGGATAAAGTTGCAGGACCACTTC  
TGCGCTCGGCCCTCCGGCTGGCTGGTTTATTGCTGAT  
AAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGTATCAT  
TGCAGCACTGGGGCCAGATGGTAAGCCCTCCCGTATCG  
TAGTTATCTACACGACGGGGAGTCAGGCAACTATGGAT  
GAACGAAATAGACAGATCGCTGAGATAGGTGCCTCACT  
GATTAAGCATTGGTAACTGTCAGACCAAGTTTACTCAT  
ATATACTTTAGATTGATTTAAAACCTTCATTTTTAATTTA  
AAAGGATCTAGGTGAAGATCCTTTTTGATAATCTCATG  
ACCAAATCCCTAACGTGAGTTTTTCGTTCCACTGAGC  
GTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAG  
ATCCTTTTTTTCTGCGCGTAATCTGCTGCTTGCAAACAA  
AAAAACCACCGCTACCAGCGGTGGTTTGTGGCCGGAT

<p>CAAGAGCTACCAACTCTTTTTCCGAAGGTAAGTGGCTT  CAGCAGAGCGCAGATACCAAATACTGTCCTTCTAGTGT  AGCCGTAGTTAGGCCACCACTTCAAGAACTCTGTAGCA  CCGCCTACATACCTCGCTCTGCTAATCCTGTTACCACT  GGCTGCTGCCAGTGGCGATAAGTCGTGTCTTACCGGGT  TGGACTCAAGACGATAGTTACCGGATAAGGCGCAGCGG  TCGGGCTGAACGGGGGGTTCGTGCACACAGCCCAGCT  TGGAGCGAACGACCTACACCGAACTGAGATACCTACAG  CGTGAGCTATGAGAAAGCGCCACGCTTCCCAGAGGGAG  AAAGGCGGACAGGTATCCGGTAAGCGGCAGGGTCGGA  ACAGGAGAGCGCACGAGGGAGCTTCCAGGGGGAAACG  CCTGGTATCTTTATAGTCCTGTCGGGTTTCGCCACCTC  TGACTTGAGCGTCGATTTTTGTGATGCTCGTCAGGGGG  GCGGAGCCTATGGAAAACGCCAGCAACGCGGCCTTTT  TACGGTTCCTGGCCTTTTGCTGGCCTTTTGCTCACATG  TTCTTTCTGCGTTATCCCCTGATTCTGTGGATAACCG  TATTACCGCCTTTGAGTGAGCTGATACCGCTCGCCGCA  GCCGAACGACCGAGCGCAGCGAGTCAGTGAGCGAGGA  AGC</p>		
<p>LigaseIvB silencing construct (circular)</p> <p>AACCTGGCTTATCGAAATTAATACGACTCACTATAGGG  AGACCGGCAGATCTGATATCATCGATGAATTCGAGCTC  CACCGCGGTGGCGGCCGCTCTAGAAGTGGATCCAC  CGGTTCCATGGCTAGCCACGTGACGCGTGGATCCCCCG  GGCTGCAGAAATCACAAAGTCGAATACTTTCCCAACCG  ATTACACTCTTAGATTTCCAAGATGTTACAAGACTAGAA  TGGACAAAGATTGGTATGAAATGATGACCACACAAGAT  TTATCAAGTATGATCAATGACTCATAATACACAAAGAAT  CTCAAAAAGAAGAATGATAAAGAAGGAAACGATAAATA  AACAGATGATGAGGTTGAAAATGAAGACAGACCTATGA  GGTAGGCTAAAGAAAGAAAATAACCCTTAAGAAAAGGT  GGAGCCCATTCTAAATAGATTACCATAATGACTGAATA  TTAAGGGTTAGATCCAAGAAACATCACTAAAGAATCCA  ACCTGTTTGTAGGATGCGAATTTTATATTGTTAACTTA  GAAGAAGATTATAATAAATAATTTTTGAATCTATAATT  CTAGCCTAAGGAGGAACTTGCATATAAAATTATATCGT  AGAAAGTGCTACTCATGTAGTGGCTTCAATTATCGACT  TTAGAGTGAATTCGATCATTGAGAAGTTTCCAACCTACC  ATAATTAGACCTCAATGGGTTATTGAATGCATTAGAAG  GTCGCAATTAGTTAATATTGCACCAAGATTTATTTTATT  TGCCCCTTTGGCTATCATGAATGAAGTGAATAAATTCT  ACGATAAATTTGGTGATTCCTATTTTCGAATTGATTGAT  GAATTTGCTCTCAAAGATATATGCGATAATATGAAAATT  AATGAACCTGGTACCCAATTCGCCCTATAGTGAGTCGT  ATTACGCGCGCTCACTGGCCGTCGTTTTACAACGTCGT  GACTGGGAAAACCCTGGCGTTACCCAACCTAATCGCCT  TGCAGCACATCCCCCTTTCGCCAGCTGGCGTAATAGCG</p>	<p>This work,  generated using  primers described  above</p>	<p>N/A</p>

AAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGC  
AGCCTGAATGGCGAATGGGACGCGCCCTGTAGCGGCG  
CATTAAAGCGCGGGGTGTGGTGGTTACGCGCAGCGT  
GACCGCTACACTTGCCAGCGCCCTAGCGCCCGCTCCTT  
TCGCTTTCTTCCCTTCTTTCTCGCCACGTTGCGCGGCT  
TTCCCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGG  
TTCCGATTTAGTGCTTTACGGCACCTCGACCCAAAAA  
ACTTGATTAGGGTGTATGGTTCACGTAGTGGGCCATCGC  
CCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCC  
ACGTTCTTTAATAGTGGACTCTTGTTCCAAACTGGAAC  
AACACTCAACCCTATCTCGGTCTATTCTTTTGATTTATA  
AGGGATTTTGCCGATTTGCGCCTATTGGTTAAAAAATG  
AGCTGATTTAACAAAAATTTAACGCGAATTTAACAAAA  
TATTAACGCTTACAATTTAGGTGGCACTTTTCGGGGAA  
ATGTGCGCGGAACCCCTATTTGTTTATTTTCTAAATAC  
ATTCAAATATGTATCCGCTCATGAGACAATAACCCTGAT  
AAATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGT  
ATTCAACATTTCCGTGTCGCCCTTATTCCCTTTTTTGCG  
GCATTTTGCTTCTGTTTTTGCTCACCCAGAAACGCT  
GGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCAC  
GAGTGGGTACATCGAACTGGATCTCAACAGCGGTAAG  
ATCCTTGAGAGTTTTCGCCCCGAAGAACGTTTTCCAAT  
GATGAGCACTTTTAAAGTTCTGCTATGTGGCGCGGTAT  
TATCCCGTATTGACGCCGGCAAGAGCAACTCGGTGCG  
CGCATACACTATTCTCAGAATGACTTGGTTGAGTACTC  
ACCAGTCACAGAAAAGCATCTTACGGATGGCATGACAG  
TAAGAGAATTATGCAGTGCTGCCATAACCATGAGTGAT  
AACACTGCGGCCAACTTACTTCTGACAACGATCGGAGG  
ACCGAAGGAGCTAACCGCTTTTTTGACAACATGGGGG  
ATCATGTAACCTCGCCTTGATCGTTGGGAACCGGAGCTG  
AATGAAGCCATACCAAACGACGAGCGTGACACCACGAT  
GCCTGTAGCAATGGCAACAACGTTGCGCAAATTTAA  
CTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTA  
ATAGACTGGATGGAGGCGGATAAAGTTGCAGGACCACT  
TCTGCGCTCGGCCCTTCCGGCTGGCTGGTTTATTGCTG  
ATAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGTATC  
ATTGCAGCACTGGGGCCAGATGGTAAGCCCTCCCGTAT  
CGTAGTTATCTACACGACGGGGAGTCAGGCAACTATGG  
ATGAACGAAATAGACAGATCGCTGAGATAGGTGCCTCA  
CTGATTAAGCATTGGTAACTGTCAGACCAAGTTTACTC  
ATATATACTTTAGATTGATTTAAACTTCATTTTTAATT  
TAAAAGGATCTAGGTGAAGATCCTTTTTGATAATCTCA  
TGACCAAATCCCTAACGTGAGTTTTCGTTCCACTGA  
GCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTG  
AGATCCTTTTTTTCTGCGCGTAATCTGCTGCTTGCAA  
CAAAAAACCACCGCTACCAGCGGTGGTTTGTGTTGCCG  
GATCAAGAGCTACCAACTCTTTTTCCGAAGGTAAGTGG  
CTTCAGCAGAGCGCAGATACCAATACTGTCTTCTAG

<p>TGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCTGTA  GCACCGCCTACATACTCGCTCTGCTAATCCTGTTACCA  GTGGCTGCTGCCAGTGGCGATAAGTCGTGTCTTACCGG  GTTGGACTCAAGACGATAGTTACCGGATAAGGCGCAGC  GGTCGGGCTGAACGGGGGGTTCGTGCACACAGCCCAG  CTTGGAGCGAACGACCTACACCGAACTGAGATACCTAC  AGCGTGAGCTATGAGAAAGCGCCACGCTTCCCGAAGGG  AGAAAGGCGGACAGGTATCCGGTAAGCGGCAGGGTCG  GAACAGGAGAGCGCACGAGGGAGCTTCCAGGGGGAAA  CGCCTGGTATCTTTATAGTCCTGTCGGGTTTCGCCACC  TCTGACTTGAGCGTCGATTTTTGTGATGCTCGTCAGGG  GGGCGGAGCCTATGGAAAAACGCCAGCAACGCGGCCT  TTTTACGGTTCCTGGCCTTTTGCTGGCCTTTTGCTCAC  ATGTTCTTTCCTGCGTTATCCCCTGATTCTGTGGATAA  CCGTATTACCGCCTTTGAGTGAGCTGATACCGCTCGCC  GCAGCCGAACGACCGAGCGCAGCGAGTCAGTGAGCGA  GGAAGC</p>		
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**Supplementary table S2.**

Identifier in text and figures	Identity on ParameciumDB <a href="http://paramecium.cgm.cnrs-gif.fr">http://paramecium.cgm.cnrs-gif.fr</a>
A	IESPGM.PTET51.1.86.43013
B	IESPGM.PTET51.1.115.110447
C	IESPGM.PTET51.1.46.377227
D	IESPGM.PTET51.1.118.81158
E	IESPGM.PTET51.1.412.3291
1	IESPGM.PTET51.1.128.196488
2	IESPGM.PTET51.1.99.289480
3	IESPGM.PTET51.1.41.81600
4	IESPGM.PTET51.1.90.61866
5	IESPGM.PTET51.1.55.237085
6	IESPGM.PTET51.1.25.73295
7	IESPGM.PTET51.1.44.313165
8	IESPGM.PTET51.1.42.184821
9	IESPGM.PTET51.1.178.17054
10	IESPGM.PTET51.1.80.170647
11	IESPGM.PTET51.1.556.208877
12	IESPGM.PTET51.1.17.435655

13	IESPGM.PTET51.1.21.531260
14	IESPGM.PTET51.1.65.88217
15	IESPGM.PTET51.1.39.111460
16	IESPGM.PTET51.1.89.477
17	IESPGM.PTET51.1.36.479871
18	IESPGM.PTET51.1.13.587192
19	IESPGM.PTET51.1.105.153096
20	IESPGM.PTET51.1.123.206988
21	IESPGM.PTET51.1.127.241939
22	IESPGM.PTET51.1.2.852221
23	IESPGM.PTET51.1.40.421487
24	IESPGM.PTET51.1.312.2346
25	IESPGM.PTET51.1.12.28085
26	IESPGM.PTET51.1.556.85893
27	IESPGM.PTET51.1.44.389851