## **Supporting Information**

PNAS PNAS

## Sherwood et al. 10.1073/pnas.1424175112

А								
	%GC <		StemI5'	>	<	StemI3	·	>
DoubCl	GAn	notif5'		AG bulge top Si	ceml	C1.000	Specifier	GAmotif3'
Beub	AAAATTCACATCAAAAAC	CAGIGAGAGAAAGAAGIAC	TGTTTCCTTCAG	CICAI-GAAAGCGACCIIAGGGCGGIC	SIAAGCIAAGGAIGAG=		CATCTACATCAC	CCTTTAGTT-
Apar	46AGTATTACTAGCACAAG	TGTGATGAGGAC-AGTAG	CTGGGTAGCG	CAAATCTCAAGCGAGCG-GAGTTGGT	GAAGTC-CGTATTTGC	GTCCG	TGTGAATATCA-	CTCGGAGCT-
Rxyl	71CAAAGCTGTTCTACAGG	GATGACGGGAACGAGTAG	GTCCGTCCCT	CCCGC-GGGAGCGAGCCGGGGACGGT	CGAGCCCGGTGCGGGA	AGCGG	TCCGAAAATCC-	CCCCGAGCC-
Faln	73CACCGACAGCGGCACGGC	GTCGACGGGGACGAGTAG	CGGCGGGCGC	AG-CCCGAGCGAGCCGGGGTTGGT(	GGAAG <mark>CCCGG</mark> TGGTCAG	CGCGT	CGCGAAG <b>ATC</b> A-C	CCCCGAGCC-
Tfus	68TCCTCAACCCAGCAAGG	GTTGATGGGGGACGAGTAC	CGGCGG <u>A</u> CA	CAGCC-ATGAGCGACCCGGGGGACGGT	GGAAGCCTGGGGGT-AT	GACCGCA	CGGGAAG <b>ATC</b> A-C	CCCCGGAGCC-
Scoe	72CTGGGCGCAGCGAACGGC	CATGGA <u>TGGGG</u> ACGAGTA <u>G</u>	CGGCGTCAG	CAGCC-CAGAGCGACCCGGGGACGGT	GTGAG <mark>CCCGGGG</mark> GGC- <u>GA</u>	<u>GCGCGA</u>	CGTGAAG <b>ATC</b> A-C	CCCC <u>G</u> GA <mark>GCC</mark> -
Mmul	55TACAGTTGGGGGCACGGC	CGTTGA <u>A</u> CCGGC	CGCGC <u>G</u> GCTT <u>G</u> T <u>G</u> TT	<u>AGCAGC</u> TCACCTG <u>GG</u> TCTTTAC	GA <u>TT</u> CATGAGGT	G- <u>CCAGCGAAAAT</u> C <u>T</u> -	-CGCGGGA <b>ATC</b> A-C	CCGGGGGAGCC-
Mcur1	55GGATAGAGTGGAATCCGG	GTTGA <u>ACCGGT</u>	CC	GG <u>GG</u> TCATT	GA <u>GT</u> CC		GG <u>G</u> T <b>ATC</b> G-C	CCGGGGGAGCT-
Mcurz Acurz	55AGATAAATTGGGTACGGC	TTTTGATCCGAC	36 36	<u>GGTTTG</u> TGTC <u>G</u> TGC	<u>T</u> GACA <u>TGAGTT</u> -		CGGGTATCG-C	CGGGGGAGCT-
Agra	57CCTACCATAGGGCATAAGC	CTTCATCCCGGC	сс	CACIC	G		CGGAIAICA-C	CCCCCCCCCCTT-
Aodo	65GCTACACTGGTTTTTCG	CTACGATCCGGC		GCTCCA	GC		GGGGTATCA-C	CCGGGGGAGCA-
A0310	GCTACACTGAGCTATCG	TACGATCCGGC	00 00	GCGTCA-			GGGGTATCA-C	CGGGGGAGCA-
A0338	GGGTAGAATCGGCGTTGC	TATGATCCGGC	cc	GCTCA	GC		GGGGCATCA-C	CGGGGGAGC
Acol	50CGCTAAGATAAAACTGG	TTATGACTCGGC	CA	GTATGACTAACA	ACCCACAC		TGGGT <b>ATC</b> A-C	CGACGAGCC
Auro	69ACTCGGCGCCAATCAGG	CACTGACCCGGC	CG	CAG-CCTCAC	GGCCTG		CGGGT <b>ATC</b> A-C	CCGGCGAGCCT
A0400	ACTCCAGCCCGTCCAGGC	CAACGA <u>CCCGG</u> C	CG	<u>G</u> GG <u>C</u> GCCGTCCG·	CGGC <u>A</u> CC <u>T</u>		CGGGC <b>ATC</b> A-C	CCGGAGAGCCT
A0384	ACTCCCCGGAGCGAAGG	CAGTGACCCGG					CC <b>ATC</b> A-C	CCGGCGAGCC-
A0386	ACTCCCCGGAGCAAAGGC	GTCGACCCGG					CCATCA-C	CCGGTGAGCC-
AU332	64GCTAGAATAAATTTTTCGC	GTTGACCCGG					CARCA-(	CGGCGAGCT-
Allae	SSACIAAAAICIGAAACIGC	AACGATCCGG					TATCA	CGGGGGAGCA-
Arthr	65GTAGAATCGAGTATCAG	TTCGACCCCC					COATCA	CCCTCACCT-
Lxvl	68AGAATGGACGGCACAGAG	CATCGACCCGG					CCATCA-C	CGGCGAGTC-
Blin	63GTATACGATTGAGGATG	AGTGATCCGG					CCATCA-C	CGGGGGAGCA-
Krad	74TAAGATGGGTGCACAGG	GTCGATCCGG					CC <b>ATC</b> A-C	CCGGTGAGCC-
Janib	68AGACTGGGGTCACAGGC	GTTCGAGCCGT					CATCA-0	GCGGTGAGCCT
Ical	71GACTTCGGAGCACAGGC	GTCTGAGCCGT					CATCA-C	GCGGCGAGCC-
Spro	GCATGGTGCCCACAGGC	GTCAGAGCCGT					CATCA-0	<u> CGGCGAGCC-</u>
Derm	69AGCATGGTGGCAACGAC	GTTCGAGCCG <u>T</u>					C <b>ATC</b> A- <u>C</u>	<u>CGGCGAGTC-</u>
Nocar	72ACCCTGTGGCCACAGGC	GTTCGAGCCG <u>T</u>					CATCA- <u>C</u>	GCGGCGAGCC-
NBroad	CCCTCTTCCTTACAGGCC	GTTCGAGCCGT					CATCA-C	GCGGCGAGCC-
Stro	70CCTTCCCCACCCCAAGC	CAGIGATGGGGG					CGATCA-C	CCCCGGAGIC-
Cdin	54AATTTCGGGATAGACGAC	CGCTGATCCAG					TAICA	TGGGGAGTC-
Nfar	71AGAATCGAGGGAGACGGG	GACGATCCGG					CCATCA-	CGGGGGGAGCC-
Rhodo	67GTAATCGAGTTACGGGGG	GACGATCCGG					CCATCA-	CGGGGGAGCC-
Mtub	65TAGAATCAGGGGAACGG	CATCGATCCGG					CGATCA-C	CCGGGGAGCC-
	<	2tomTT5!			.31	StomT	Ta/b	
BsubGl	<s S-turn5' y</s 	StemII5'	>	<stemii< th=""><th>3' S-turn3'</th><th>&gt;<stemi Pseudoknot</stemi </th><th>Ia/b&gt; F box TTT</th><th>TAAAAAAGAG</th></stemii<>	3' S-turn3'	> <stemi Pseudoknot</stemi 	Ia/b> F box TTT	TAAAAAAGAG
BsubGl Bsub	<s S-turn5' Y TCCT<u>TG</u>CTGAAC</s 	StemII5'	> TCA	<stemi)< td=""><td>3' S-turn3' CAGTA<u>GGT</u></td><td>Pseudoknot</td><td>Ia/b&gt; F box CGTTAC<mark>GATG</mark>CT</td><td>TAAAAAAGAG CAAGAG</td></stemi)<>	3' S-turn3' CAGTA <u>GGT</u>	Pseudoknot	Ia/b> F box CGTTAC <mark>GATG</mark> CT	TAAAAAAGAG CAAGAG
BsubGl Bsub Apar	<s S-turn5' YGAAC GCAGTCAAAC-GTA</s 	3temII5'	> TCA	<stemi) </stemi) 	3'CAGTA <u>GGT</u>	Pseudoknot	Ia/b> F box TTT CGTTACGATGCT CGTGACAGGCCAGC-	TAAAAAAGAG CAAGAG CGAGTAA
BsubGl Bsub Apar Rxyl Falm	<s S-turn5' Y</s 	StemII5'	> TCA CAA <u>G</u> TGTG GGGGCGCCG	StemI1 	S-turn3' CAGTA <u>GGT</u> TAC-TAGTAGAT <u>G</u> C CGTCAAGTAGGCC	Pseudoknot Pseudoknot AGGACGTTCATCA -TGCCGGAAATGGTCGC GGGCCGGGTTCG-CC	Ia/b> F box CGTTACGATGCT CGTGACAGGCCAGC- CGTTACAGCGAGA- CGTTACAGCGAGA-	TAAAAAAGAG CAAGAG CGAGTAA 1-GCGGAGCG
BsubGl Bsub Apar Rxyl Faln Tfus	<	StemII5'	> TCA CAA <u>G</u> TGTG GGGGGCGCG 	<stemi </stemi 	S-turn3' S-turn3' TAC-TAGTAGATGC CGTCAAGTAGGCC CCC-CAGTAGACCC GCT-CAGTAGAACC	> <stemi Pseudoknot PAGGACGTTCATCA -TGCCGGAAATGGTCGCC GGGCCGGCTTCG-CC -GGCCGGT</stemi 	Ia/b> F box CGTTACGATGCT CGTGACAGGCCAGC- CGTTACAGCGAGA CGTTACAGCGAGA CGCGAGCT	TAAAAAAGAG CAAGAG CGAGTAA 1-GCGGAGCG CTGACGAGAG CCGACGAGAG
BsubGl Bsub Apar Rxyl Faln Tfus Scoe	<	StemII5' <u>AA</u> <u>-AA</u> <u>AA</u>	> CAA <u>G</u> TGTG GGGGCGCCG -GTC <u>G</u> CGGCCCA -GTG <u>G</u> CGGGCAC -GTG <u>G</u> CGGGACA	<stemii -TTTG</stemii 	S-turn3' CAGTA <u>GGT</u> TAC-TAGTAGATGC CGTCAAGTAGGC CCC-CAGTAGACCC- GCC-CAGTAGAACC GCC-CAGTAGAACC	Pseudoknot I Pseudoknot I IAGGACGT-TCATC-A4 -TGCCGGAATGGTCGC GGGCCGGG-TTCG-CC -GGCCGCC- -GGCCGCC	Ia/b> F box TTT CGTTACGATGCT CGTGACAGGCCAGC- CGTTACAGCGAGA- CA GCGAGCT CA	TAAAAAAGAG CAAGAG CGAGTAA 1-GCGGAGCG CTGACGAGAG GCAACGAGTG CCAATGAGGG
BsubGl Bsub Apar Rxyl Faln Tfus Scoe Mmul	<	StemII5' <u>AA</u> AC <u>C</u> CC	> CAAGTGTG GGGGCGCGCG GCGCGCCGCCGCA GTCTGTGCG -GTGCCAGGACA -GTGCCAGGACA	<stemii TTTG CGCCCCAGG</stemii 	S-turn3' CAGTA <u>GGT</u> TAC-TAGTAGATGC CGTCAAGTAGGC -CCCAGTAGACC -GCT-CAGTAGAACC -GCC-GAGTAGAACC -GCT-CATTAGAATC	Pseudoknot I Pseudoknot I TAGGACGTTCATCA( -TGCCGGAAATGGTGGC GGGCCGGGTTCG-CC -GGCCGCC	Ia/b> F box CGTTACGATGCT CGTGACAGGCCAGC CGTTACAGCGAGA GCGAGCT CA GACC CGTAATCATCCCGA	TAAAAAAGAG CAAGAG CGAGTAA 1-GCGGAGCG CTGACGAGAG GCAACGAGTG CCAATGAGGG AGGAAGCG
BsubGl Bsub Apar Rxyl Faln Tfus Scoe Mmul Mcur43	<	StemII5'	> 	<stemi] </stemi] 	S-turn3' CAGTA <u>GGT</u> -TAC-TAGAT <u>GC</u> -CGTCAAGTAGGC -CC-CAGTAGACCC -GCT-CAGTAGAACC -GCC-CATTAGAATC -GCT-CATTAGAATC -GCTCACTAGACTC	Pseudoknot 1 Pseudoknot 1 PGGACGTTCATCAC -TGCCGGAAATGGTCCC GGCCGGCTTCC-CC -GGCCGCC	Ia/b> F box TTT CGTACAGCCAGC- CGTACAGCCAGC- CGTACAGCCGAGA- CA CGTACAGCCGAC- CGTACAGCCGCG- CGTCACAGCCGTC	TAAAAAGAG CAAGAG CGAGTAA 1-CCGGACCG CTGACGAGAG GCAACGAGTG CCAATGAGGG AGGAAGCG CTTGACGG
BsubGl Bsub Apar Rxyl Faln Tfus Scoe Mmul Mcur43 Mcur51	<	StemII5'AA AA AC <u>C</u> CC	> 	<stemi </stemi 	S-turn3' GAGTAGGT TAC-TAGTAGATGC CGTCAAGTAGGGC -CC-CAGTAGAACC GGC-CAGTAGAACC GGC-CAGTAGAATC GACTCACTAGACTC GACTCACTAGACTC	> <stemi Pseudoknot IAGGACGTTCATCA -TGCCGGAATGGTCGCC GGGCCGGGTTCG-CC -GGCCGCC</stemi 	Ia/b> F box TTT CGTTACAGCCAGC- CGTTACAGCCAGA- GCGAGCT 	TAAAAAAGAG CGAGTAA 1-CCGAGCAGA CTGACGAGAG GCAACGAGAGG CCAATGAGGG ATGAACGG CTTGACGG CTTGACG
BsubGl Bsub Apar Rxyl Faln Tfus Scoe Mmul Mcur43 Mcur43 Agra	<	StemII5' <u>AA</u> <u></u>	> CAAGTGTG GGGGCGCCG GCGGCGCCGA GTGCCAGCA GCGTGCCGA CGGTGCCGA T-AGCTCTAGTT	<stemil -TTTG</stemil 	S-turn3' CAGTA <u>GGT</u> -TAC-TAGTAGATGC CGTCAAGTAGACCC CCC-CAGTAGAACC GCC-CAGTAGAACC GCC-CAGTAGAACC GCC-CAGTAGAACC GACTCACTAGACTC CCCCTAGTAGAACC	Pseudoknot I Pseudoknot I AGGACGTTCATCA( -TGCCGCAAATGGTCGC GGCCCGGGTTCG-CC -GGCCGCC	Ia/b> F box CGTGACAG <u>GCCAGC</u> - CGTGACAG <u>GCCAGC</u> - CGTACAGCGAGA- GCGAGCT GCCACCCGA- CGCACAGCTGT CGTCACAGCTGT CGTCACAGCTGT CGTCACAGCCGC	TAAAAAGAG CAAGAG CGAGTAA I-GCGGAGCG CTGACGAGAG GCAACGAGCG AGGAAGCG CTTGAGCG CTTGACGG -AATTAACCG
BsubGl Bsub Apar Rxyl Faln Tfus Scoe Mmul Mcur43 Mcur51 Agra Atur	<	StemII5' <u>AA</u> <u>-AA</u> AC <u>C</u> CC 	> 	<stemi TTTG</stemi 	S-turn3' CAGTA <u>GGT</u> -CGTCAAGTAGGC CGTCAAGTAGGC CCC-CAGTAGACCC GGC-GAGTAGAACC GGC-GAGTAGAACC GACTCACTAGACTC -GACTCACTAGACTC :CCCCACAGTAGAACC :CCCCACAGTAGAACC	Pseudoknot 1 Pseudoknot 1 PGGACGTTCATCA -TGCCGGAAATGGTGGC GGCCGGCTTCG-CC -GGCCGAT	Ia/b> F box 	TAAAAAGAG CAAGAG CGAGTAA 1-GCGGAGAG CTGACGAGGG GCAACGAGGG AGGAAGCG CTTGAGCG -AATTAAGGG AAAAGAACCG
BsubGl Bsub Apar Rxyl Faln Tfus Scoe Mmul Mcur43 Mcur51 Agra Atur Adur Adur	<	AA ACCCC CC CC CC CC CC CC CC CC CC CC C	> 	<stemi </stemi 	S-turn3' S-turn3' TAC-TAGTAGATGC- CGTCAAGTAGGC CGTCAGTAGAACC GGC-CAGTAGAACC GGC-GAGTAGAACC GACTCACTAGATCC GACTCACTAGACCC CCCCACGTAGAACC CCCCACGTAGAACC CCCCACGTAGAACC	Pseudoknot 1 Pseudoknot 1 PGGACGT-TCATCA -TGCCGGAATGGTCGCC GGGCCGGG-TTCG-CC -GGCCGGAT	Ia/b> F box TTT CGTACAGCCAGC CGTACAGCCAGC CGTACAGCCAGC 	TAAAAAGAG CAAGAG CTGACGGAACG CTGACGAGAGG CCAATGAGGG AGGAAGCG CTTGAGCG CTTGAGCG -AATAAAGCG -AAAGAAGCG -AACGAAGCG
BsubGl Bsub Apar Rxyl Faln Tfus Scoe Mmul Mcur43 Mcur43 Acur51 Agra Atur Aodo30 A0310	<	StemII5'AA 	> 	<stemi TTTG</stemi 	S-turn3' 	Pseudoknot I Pseudoknot I TGCGGAAATGGTCGCC GGGCCGGG-TTCG-CC -GGCCGCC	Ia/b> F box GGTACAGGCCAGC- CGTACAGGCCAGC- CGTACAGCCAGA- GCCAGCT CGTACAGCAGA- 	TAAAAAGAG CAAGAG CTGACGAGAG GCAACGAGAGG GCAACGAGAGG CTTGAGCG CTTGAGCG -AATTAAGCG AAAAGAACCG -AACGAAAGCG AACGAAACGG
BsubGl Bsub Apar Rxyl Faln Mcur43 Mcur43 Mcur43 Agra Atur Aodo30 A0310 A0338	<	StemII5' <u>AA</u> <u>ACCCC</u> ACCCC 	>	<stemil -TTTG</stemil 	S-turn3' CAGTAGGT TAC-TAGTAGATGC CGTCAAGTAGATCC GCT-CAGTAGAACC GCT-CAGTAGAACC GCT-CAGTAGAACC GACTCACTAGATC CCCCAGTAGAACC CCCCAGTAGAACC CTT-CAGTAGAACC CTT-CAGTAGAACC CTT-CAGTAGAACC CCCCCAGTAGAACC CCCCCAGTAGAACC CCTC-CAGTAGAACC CCTC-CAGTAGAACC CCTC-CAGTAGAACC CCTC-CAGTAGAACC CCTC-CAGTAGAACC CCCCCAGTAGAACC CCCCCAGTAGAACC CCCCCAGTAGAACC CCCCCAGTAGAACC CCCCCAGTAGAACC CCCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCT-CAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCT-CAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCT-CAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCT-CAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCACC CCCCAGTAGAACC CCCCCAGTAGAACC CCCCCAGTAGAACC CCCCCAGTAGAACC CCCCCAGTAGAACC CCCCCAGTAGAACC CCCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCACGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCCAGTAGAACC CCCCAGTAGAACC	Pseudoknot I Pseudoknot I AGGACGTTCATCA( -TGCCGGAAATGGTCGC GGCCGGCTCGGCC -GGCCGCC	Ia/b> F box 	TAAAAAAGAG CAAGAG CCAGGAGGG CTGACGGAGGG CCAACGAGAG CCAATGAGGA AGGAAGGG ATGAAGGG AATTAAGGG AAAAGAAGGG -AACGAAGAG -AACGAAGAG CAATTAAGGAAGGG
BsubGl Bsub Apar Rxyl Tfus Scoe Mmul Mcur43 Mcur51 Agra Atur Aodo30 A0310 A0330 Acol	<	AtemII5'AA 	>	<stemi -TTTG</stemi 	S-turn3' CAGTAGGT -TAC-TAGTAGATGC	Pseudoknot 1 Pseudoknot 1 Pseudoknot 1 PGGACGTTCATCA( GCCGGGA-TTCG-CC( GGCCGGC-TTCG-CC( GGCCGGCTCGGATC( CGACGGGTCGGATC( CGACGGGTGGG-CC( GGACGGGTGGG-CC( GGACGGGGGGC-CC( GGACGGG-AGGG-CC( GGACGGG-AGGG-CC( GGACGGG-AGGG-CC( GGACGGG-AGGG-CC( GGACGGG-AGGG-CC( GGACGGG-AGGG-CC( GGACGGG-AGGG-CC( GGACGGG-AGGG-CC( GGACGGG-AGGG-CC( GGACGGG-AGGG-CC( GGACGGG-AGGG-CC( 	Ia/b> F box CGTTACGATGCT CGTTACAGCCAGC CGTTACAGCCAGC CGTACAGCCAGC CGTACAGCCGAGA CGTACACCCGC CGTCACAGCCGC CGTTACAGCCCC CGACACAGCCCC CGACACAGCCC CGACACAGCCC CGACACAGCCC CGACACAGCCC CGACACAGCCC CGACACAGCCC CGACACAGCCC CAGCACAGCCC	TAAAAAAGAG CAAGAG CTGACGAGGG CTGACGAAGG GCAACGAGTG CCAATGAGGG ATGAAGCG CTTGAGCG CTTGAGCG -AATAAACGG AAAAGAAGCG -AACGAAGCG -AACGAAGAG CATTAACGG CAACGACG
BsubGl Bsub Apar Rxyl Faln Tfus Scoe Mmul Acur43 Mcur43 Mcur51 Agra Atur Acur51 Adur51 Adur51 Acur51	<	StemII5'         -AA         -ACCCC         -GGTAC         -GGTAC         -GGCACCA         -GAGCCC	>	<stemi </stemi 	S-turn3' CAGTAGGT -TAC-TAGTAGATGC -GCTCAGTAGATCC -GCT-CAGTAGAACC -GCT-CAGTAGAACC -GACTCACTAGATC -GACTCACTAGACTC -CCCCACTAGACC -CCCCAGTAGAACC -CCCCAGTAGAACC -CCCCAGTAGAACC -CCCCCAGTAGAACC -CCCCCAGTAGAACC -CCCCCAGTAGAACC -CCCCCAGTAGAACC -CCCCCAGTAGAACC -CCCCCAGTAGAACC -CCCCCAGTAGAACC -CCCCCAGTAGAACC -CCCCCAGTAGAACC -CCCCCAGTAGAACC -CCCCCAGTAGAACC -CCCCCAGTAGAACC -CCCCCCCCCGAGAGACC -CCCCCCCCCCCCC -CCCCCCCCCCCCCC	Pseudoknot 1 Pseudoknot 1 PagGACGT - TCATCA -TGCCGGAAATGGTCGCC -GGCCGCGG - TTCG-CC -GGCCGCGTCGGATC -CGACGGG - TAGG-CC -CGACGGG - TAGG-CC -GGACGGG - CGG-CC -GGACGGG - CGGC-CC -GGACGGG - AGGG-CC -GGACGGG - CGGC-CC -GGACGGG - TAAG-CC -GGACGGG - TAAG-CC -GGACGGG - TAAG-CC -GGCCGGG - TAAG-CC -GGCCGGG - TAAG-CC -GGCCGGG - TAAG-CC -GGCCGGG - CC -GGCCGGG - CC 	Ia/b> F box 	TAAAAAGAG CAAGAG CGGAGTA 1-CCGGACG CTAACGAGGG CCAACGAGGG CTTGAGCG CTTGAGCG CTTGAGCG -AACGAAGCG -AACGAAGCG -AACGAAGCG -AACGAAGAG -CATTAACCG -CACGACCC CACCACCC
BsubG1 Bsub Apar Rxy1 Faln Tfus Scoe Mmu1 Mcur51 Agra Atur Aoda30 A0310 A0338 Aco1 Auro A0400 P0204	<	StemII5'	>	<stemil -="" td="" tttg<=""><td>S-turn3' CAGTAGGT CAGTAGATGC CGTCAAGTAGACC </td><td>Pseudoknot I Pseudoknot I TAGGACGTTCATCA( -TGCCGGAAATGGTCGC( CGGCCGGGGTTCG-CC( -GGCCGGCTCG-CC( -GGCCGGCTGGGATC( -CGACGGGTGGG-CC( -CGACGGGTGAG-CC( -GGACGGTGAG-CC( -GGACGGCGGGC-CC( -GGACGGCCGGC-CC( -GGACGGCCGGC-CC( -GGACGGCCGGC-CC( -GGACGGCTAGGC-CC( -GGCCGGC-TGGC-CC( -GGCCGGC-TGAGGC-CC( -GGCCGGC-TGAGGC-CC( -GGCCGGC-TGAGGC-CC( -GGCCGGC-TGAGGC-CC( -GGCCGGC-TGAGGC-CC( -GGCCGGCGC-TGGCCC( -GGCCGGCGC-TGGCCC( -GGCCGCGC-TGGCCC( -GGCCGGC-TGGC-CC(</td><td>Ia/b&gt; F box</td><td>TAAAAAAGAG CAAGAG CCACGGAGGG CTGACGAAGG CCAACGAAGTG CCAATGAGGA AGGAAGCG CTTGAGCG AATTAAGCG AAAGAAGCG -AACGAAGCG -AACGAAGAG -CAAGGAAGCG -CAAGGAGCG -CAACGAACG</td></stemil>	S-turn3' CAGTAGGT CAGTAGATGC CGTCAAGTAGACC 	Pseudoknot I Pseudoknot I TAGGACGTTCATCA( -TGCCGGAAATGGTCGC( CGGCCGGGGTTCG-CC( -GGCCGGCTCG-CC( -GGCCGGCTGGGATC( -CGACGGGTGGG-CC( -CGACGGGTGAG-CC( -GGACGGTGAG-CC( -GGACGGCGGGC-CC( -GGACGGCCGGC-CC( -GGACGGCCGGC-CC( -GGACGGCCGGC-CC( -GGACGGCTAGGC-CC( -GGCCGGC-TGGC-CC( -GGCCGGC-TGAGGC-CC( -GGCCGGC-TGAGGC-CC( -GGCCGGC-TGAGGC-CC( -GGCCGGC-TGAGGC-CC( -GGCCGGC-TGAGGC-CC( -GGCCGGCGC-TGGCCC( -GGCCGGCGC-TGGCCC( -GGCCGCGC-TGGCCC( -GGCCGGC-TGGC-CC(	Ia/b> F box	TAAAAAAGAG CAAGAG CCACGGAGGG CTGACGAAGG CCAACGAAGTG CCAATGAGGA AGGAAGCG CTTGAGCG AATTAAGCG AAAGAAGCG -AACGAAGCG -AACGAAGAG -CAAGGAAGCG -CAAGGAGCG -CAACGAACG
BsubGl Bsub Apar Rxyl Faln Tfus Scoe Mmul Acur43 Mcur43 Mcur43 Mcur43 Acur51 Agra Atur Aod300 A0310 A0330 Auro A0400 A0400 A0384 A0384	<	AA         -AA         -ACCCC         -ACCCCC	>	<stemi -TTTG</stemi 	S-turn3' CAGTAGGT -TAC-TAGTAGATGC	Pseudoknot I Pseudoknot I Pseudoknot I PGGACGTTCATCA GCCGGGAATGGTGGCC GGCCGGCTTCGATCC -GGCCGGCTCGGATCC CGACGGGTCGGACCC CGACGGGTGGGCCC GGACGGGTGGGCCC GGACGGG-AGGGCCC GGACGGG-AGGGCCC GGACGGG-TGAGCCC GGACGGG-TGAGCCC GGCCGGG-AGGGCCC GGCCGG-AGGGCCC GGCCGG-AGGGCCC	Ia/b> F box CGTTACGATGCT CGTTACAGCCAGC CGTTACAGCCAGC CGTACAGCCAGC CGTACAGCCAGC CGTACAGCCGC CGTTACAGCCCC CGACACAGCCCC CGACACAGCCCC CGACACAGCCCC CGACACAGCCCC CGCACAGCCCC CGCACAGCCCC CGCACAGCCCCC CGCACAGCCCCC CGCACAGCCCCC CGCACAGCCCCC CGTCACAGCCCCC CGTCCACGCCCC CGTCACAGCCCCC CGTCACAGCCCCC CGTCCACGCCCC CGTCCACGCCCC CGTCACAGCCCCC CGTCACAGCCCC CGTCACAGCCCCC CGTCACAGCCCC CGTCACAGCCCC CGTCACAGCCCCC CGTCACAGCCCCC CGTCACAGCCCC CGTCACAGCCCC CGTCACAGCCCC	TAAAAAAGAG CAAGAG CTGACGAAGG CTGACGAAGG CCAATGAGGG AGGAACGG CTTGAGGG CTTGAGGG -ATTAACGG AAAAGAAGGG -AACGAAAGGG -AACGAAGGG -CAAGGAAGGG -CAAGGAACGG -AACGAACGG -AACGAACGG -AACGAACGG
BsubGl Bsub Apar Rxyl Faln Tfus Scoe Mmul Acur51 Agra Atur Aodo30 A0310 A0338 Acol Auro A0384 A0386 A0386	<		>	<stemi </stemi 	S-turn3' CAGTAGGT -TAC-TAGTAGATGC CGTCAAGTAGATC GGC-CAGTAGAACC GGC-CAGTAGAACC GGC-CAGTAGAACC GACTCACTAGACTC GACTCACTAGACC CCCCAGTAGAACC CCCCAGTAGAACC CCCCCCAGTAGAACC CCCCCCAGTAGAACC CCCCCCAGTAGAACC CCCCCCAGTAGAACC CCCCCCCCCCCCCCCCCC CCCCCCCCCC	Pseudoknot I Pseudoknot I PGGACGTTCATCA -TGCCGGAAATGGTCGCC GGGCCGGGTTCGC-CC -GGCCGGCTCGGATC -GGCCGGCTGGGATC -CGACGGGTAGG-CC -CGACGGGTAGG-CC -GGACGGCCGGG-CC -GGACGGC-AGGG-CC -GGACGGC-AGGG-CC -GGACGGC-AGGG-CC -GGACGGC-AGGG-CC -GGACGGC-AGGG-CC -GGACGGC-AGGG-CC -GGACGGC-ACGGC-CC	Ia/b> F box	TAAAAAGAG CAAGAG (TGACGAGGACG CTGACGAGGG (CAACGAGGAGGG CTTGAGGG CTTGAGGG CTTGAGGG -AAGAAAGG -AACGAAGGG -AACGAAGAG -AACGAAGAG -GACGAAGGG AAACGAAGCG AAACGAAGCG -AACGAAGCG AACGAAGCG
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BsubGl Bsub Apar Rxyl Faln Tfus Scoe Mmul Acur51 Agra Aodo30 A0310 A0330 A0310 A0330 A0310 A0338 Acol A0384 A0386 A0332 Ahae Blon Arthr Lxyl Blin Krad Janib Ical Spro Derm	<	StemII5'	>	<stemi TTTG</stemi 	S-turn3' TAC-TAGTAGATGC CGTCAAGTACGGC CGTCAGTAGAACC GGC-CAGTAGAACC GGC-CAGTAGAACC GACTCACTAGAATC GACTCACTAGAATC GACTCACTAGACC CCCCACGTAGAACC CCCCACGTAGAACC CCCCCAGTAGAACC CCCCCAGTAGAACC CCCCCAGTAGAACC CCCCCAGTAGAACC CCCCCAGTAGAACC CCCCCAGTAGAACC GCCCCAGTAGAACC GCCCCAGTAGAACC GCC-CAGTAGAACC GCC-CAGTAGAACC GCCCCAGTAGAACC GCCCCAGTAGAACC CCCCCAGTAGAACC CCCCCAGTAGAACC CCCCCAGTAGAACC CCCCCAGTAGAACC CCCCCAGTAGAACC CCCCCAGTAGAACC CCCCCAGTAGAACC CCCCCAGTAGAACC CCCCCAGTAGAACC CCCCCAGTAGAACC CCCCCAGTAGAACC CCCCCAGTAGAACC CCCCCAGTAGAACC CCCCCAGTAGAACC CCCCCAGTAGAACC CCCCCAGTAGAACC CCCCCAGTAGAACC CCCCCAGTAGAACC CCCCCAGTAGAACC	> <stemi Pseudoknot TAGGACGTTCATCAA TGCCGGAAATGGTCGCC GGGCCGCGGTTCGC-CC GGCCGGCTTCGCATC CGACGGGTAGG-CC CGACGGTAGG-CC CGACGGTAGG-CC GGACGGCGGG-CC GGACGGAGGG-CC GGACGG-ACGGC-CC GGACGG-ACGGC-CC GGACGG-TTGGAC-CC GGACGG-TTGGAC-CC GGACGG-TTGGAC-CC GGACGG-TGCGC-CC GGACGG-TGCGC-CC GGACGG-TGCGC-CC GGACGG-TGCGC-CC GGACGG-TGCGC-CC GGACGG-TGCGC-CC GGACGG-TGCGC-CC </stemi 	Ia/b> F box	TAAAAAAGAG CAAGAG CCACGGAGCG CTGACGGAGCG CCAACGAACTG CCAATGAGGA AGGAACGG ATGAACGG -ATTAACCG AAATAAAGAAGCG -AACGAAGCG -AACGAAGCG CAACGAACGCG -AACGAAGCG -AACGAACGCG -AACGAACGCG -AACGAACGCG AACGAACGCG AACGAACGCG CATGAAGCG GCATGAAGCG CACGAACGCG CACGAAGCG -CACGAACGCG -CACGAACCG
BsubGl Bsub Apar Rxyl Faln Tfus Scoe Mmul Acur43 Mcur43 Mcur43 Adur51 Adya Adur51 Adya Adur51 Adya Adus Adus Adus Adus Adus Adus Adus Adus	<	StemII5'AA 	>	<stemi TTTG</stemi 	S-turn3' CAGTAGGT -TAC-TAGTAGATCC	Pseudoknot 1 Pseudoknot 1 Pseudoknot 1 PGCaCGAT-TCATC-A GGCCGCC-TTCG-CC GGCCGCC-TTCG-CC -GGCCGCC-TCGATC -CGACGGC-TCGCATC -CGACGGC-TCGCATC -GGACGGC-TGGC-CC -GGACGGC-TGGC-CC -GGACGGC-AGGC-CC -GGACGGC-AGGC-CC -GGACGGC-AGGC-CC -GGCCGGC-TGGC-CC -GGCCGGC-TGGC-CC -GGACGGC-TGGC-CC -GGACGGC-TGGC-CC -GGACGGC-TGGC-CC -GGACGGC-TGGC-CC -GGACGGC-TGGCCC -GGACGGC-TGGCC-CC -GGACGGC-TGGCC-CC -GGACGGC-TGGCC-CC -GGACGGC-TGGCC-CC -GGACGGC-TGGCC-CC -GGACGGC-CC -GGACGGC-CC -GGACGGC-CC -GGACGGC-CC -GGACGGCCC -GGACGGC-CC -GGACGGC-CC -GGACGGC-CC -GGACGGC-CC -GGACGGC-CC -GGACGGC-CC -GGACGGC-CC -GGACGGC-CC -GGACGGC-CC -GGACGGC-CC -GGACGGC-CC -GGACGGC-CC -GGACGGC-CC -GGACGGC-CC -GGACGGC-CC -GGACGGC-CC -GGACGGCC -GGACGGC-CC -GGACGGC-CC -GGACGGC-CC -GGACGGCC -G	Ia/b> F box	TAAAAAAGAG CAACAG (TCACGAAGCG (TCACGAAGCG (CAACGAACGC (CAATGAGCG) CTTGACCG CTTGACCG CTTGACCG -ATTAACGA AAAGAACG -AACGAACGC -AACGAACGC AACGAACGC (-CAAGGAACGC AATGAACGA (CAATGAACGC AATGAACGA (CAATGAACGC AAACGAACGG (ACAACAACGC AACAAACGCG (ACAACAACGC (CATGAACGACG (CACGAACGC (CACGAACGC (CACGAACGC (CACGAACGC (CACGAACGC (CACGAACGC (CACGAACGC (CACGAACGC (CACGAACGC (CACGAACGC (CACGAACGC)
BsubGl BsubGl Rxyl Faln Scoe Mmul Mcur43 Acur51 Agra Atur Aodo30 A0310 A0330 A0300 A0300 A0300 A0384 A0386 A0382 Ahae Blon Arthr Lxyl Blin Krad Janib Ical Spro Derm Nocar	<	AA ACCCC AACCCC GTACCGTAACTCGCAGI STTAGCGTTAACTCGCAGG CGCAGCAG CGCAGCAG AGAGCGG AAGTAGC CCCACCACCA CCCACCA CCCACCACA CCCACCACCACA CCCACCACA CCCACCACA CCCACCACACA CCCACCACA CCCACCACA CCCACCACACA CCCACCACACA CCCACCACACACA	>	<stemi -TTTG</stemi 	S-turn3' 	Pseudoknot I Pseudoknot I Pseudoknot I Pseudoknot I PGGACGT - TCATC - A( GCCGGAATGCTCGCC CGGCCGCG - TTCGCCCC GGCCGG - TAGGCCC CGACGG - TAGGCCC CGACGG - TAGGCCC CGACGG - TAGGCCC GGACGG - AGGGCCC GGACGG - AGGGCCC GGACGG - AGGGCCC GGACGG - AGGGCCC GGACGG - ACGCCC GGACGG - CCGCCC GGACGG - CCGCCC GGACGG - CCGCCC GGACGG - CCGCCC GGACGG - CCGCCC GGACGG - TGGACCCC GGACGG - TGGACCCC GGACGG - TGGCCCC GGACGG - TGGCCCC GCACGG - TAGCCCC 	Ia/b> F box	TÀAÀAÀAGAG CAXGAG CTGACGAGAG CCACGGAGCG CCAATGAGGG AGGAACCG CTTGAGCG CTTGAGCG -ATTAÀCCG AAACGAAGCG -AACGAAGCG -AACGAAGAG CATTAÀCGA CATTAÀCGA CATTAÀCGA CATTAÀCGA CATTAÀCGA CATTAÀCGA CATTAÀCGA CATTAÀCGA CATTAÀCGA CATTAÀCGA CATTAÀCGA CATGAAGAG CATAGAAGCG CACAAGAGCG AAACGAAGCG CACAGAAGCG CACAGAAGCG CACAGAAGCG CACAGAAGCG CACAGAAGCG
BsubGl Bsub Apar Rxyl Faln Tfus Scoe Mmul Mcur51 Agra Atur Aodo30 A0310 A0384 Acol A0384 A0384 A0386 A	<		>	<stemi -TTTG</stemi 	S-turn3' TAC-TAGTAGATG	> <stemi: Pseudoknot 1 PaggAcGTTCATCA( </stemi: 	Ia/b> F box	TAAAAAAGAG CAAGAG CTGACGAGGG CCAACGAGGG CCAACGAGGG CTGAGGG CTTGAGGG CTTGAGGG CTTGAGGG -AACGAAGGG -AACGAAGGG -AACGAAGGG -AACGAAGGG AAACGAAGGG AAACGAAGGG CAATAGAGGG CAATAGAGGG CTATGAGGG CTATGAGGG CTATGAGGG CTATGAGGG CACAAGAGCG CACAAGAGCG CACAAGAGCG CACGAAGGG CACAGAAGCG CACGAAGGG CACGAAGGG CACGAAGGG CACGAAGGG CACGAAGGG CACGAAGGG CACGAAGGG CACGAAGGG CACGAAGGG CACGAAGGG CACGAAGGG CACGAAGGG CACGAAGGG CACGAAGGG CACGAAGGG CACGAAGGG
BsubGl BsubGl Apar Rxyl Falns Tfus Scoe Mmul Mcur43 Acur51 Agra Atur Aod300 A0330 Acol A0330 A0300 A0338 Acol A0330 A0300 A0338 Acol A0330 A0300 A0330 A0300 A0332 Ahae Blon Arthr Lxyl Blin Krad Janib Jcal Spro Derm Nocar NBroad Pacn	<	StemII5'AA 	>	<stemi TTTG</stemi 	S-turn3' CAGTAGGT GGT 	Pseudoknot I Pseudoknot I Pseudoknot I Pseudoknot I Pseudoknot I PGC266AATGGTGCC GGCCGCG - TTCG-CC -GGCCGCG - TCGATC -CGACGG - TCGATC -CGACGG - TCGATC -CGACGG - TCGATC -GGACGG - TGGCC -GGACGG - TGGCC -GGACGG - TGGCC -GGACGG - ACGC-CC -GGACGG - CGGC-CC -GGCCGG - TAGC-CC -GGCCGG - TAGC-CC -GGCCGG - TAGC-CC -GGCCGG - TAGC-CC -GGACGG - TAGC-CC -GGACGG - TGGC-CC -GGACGG - TGGCC-CC -GGACGG - TGGC-CC -GGACGG - TGGCC -GGACGG - TGGCC -GGACGG - TGGC-CC -GGACGG - TGGC	Ia/b> F box	TAAAAAAGAG CAAGAG (TCACGAAGCG (TCACGAAGCG (CAACGAAGCG AGGAAGCG ATGAAGCG ATTGAAGG AAATGAAGCG -AACGAAGCG -AACGAAGCG -AACGAAGCG -CAAGGAAGCG -CAAGGAAGCG -CAAGGAAGCG GCAATGAACG GCAATGAACG GCAATGACG GCAATGACG GCAAGAAGCG GCAAGAAGCG CAAGGAAGCG CAAGGAAGCG TGAAGGAGCG AAACGAAGCG CAAGGAAGCG TGAAGGAGCG TAACGAAGCG CAAGGAACTG CACGAAGCG
BsubGl BsubGl Apar Rxyl Faln Scoe Mmul Agra Atur Aodo30 Ao	<	StemII5'AA 	>	<stemi -TTTG</stemi 	S-turn3' 	Pseudoknot I Pseudoknot I Pseudoknot I Pseudoknot I PGG2CGGAT-TCATC-AA GCCGGGATTCGATCCC GGCCGCG-TTCGATCC GGCCGGC-TCGGACCC CGACGGG-TAGGCCC CGACGGG-TGGGCCC GGACGGC-AGGGCCC GGACGGC-AGGGCCC GGACGGC-AGGGCCC GGACGGC-AGGGCCC GGACGGC-AGGGCCC GGACGGC-AGGGCCC GGACGGC-AGGGCCC GGACGGC-AGGGCCC GGACGGC-ACGGCCC GGACGGC-ACGGCCC GGACGGC-ACGGCCC GGACGGC-ACGGCCC GGACGGC-ACGGCCC GGACGGC-ACGGCCC GGACGGC-ACGGCCC GGACGGC-ACGGCCC GGACGGC-ACGGCCC GGACGGC-ACGGCCCC GGACGGC-TCGGCCCC GGACGGC-TGGGCCCC 	Ia/b> F box	TÀAÀAÀAGAG CAXGAG CTGACGAGAGG CTGACGAAGAG CCAATGAGGAG AGGAACGG CTTGAGGG CTTGAGGG CTTGAGGG -ATTAACGG AAAGAAAGGG -AACGAAGGG -AACGAAGGA CATTAAGCG -AACGAAGGA CAATGAAGAG C-AATGAAGGA GCTATGAGGG GCTATGAGGG GACAGAAGGG ACGAAGGG ACGAAGGG CTATGAACGG CTATGAACGG CTATGAACGG CACAGAAGAGG CACAGAAGAGG CACAGAAGGG CACAGAAGGG CACAGAAGGG CACAGAAGGG CACAGAAGGG CACAGAAGGG CACAGAAGGG CACAGAAGGG CACAGAAGGG CACAGAAGGG CACAGAAGGG CACAGAAGGG CACAGAAGGG
BsubGl Bsub Apar Rxyl Faln Tfus Scoe Mmul Acur Aur Acur Aur Aodo30 Ao310 Ao338 Acol Auro Ao336 Acol Acol Acol Acol Acol Acol Acol Acol	<	AA         ACCCC         ACCCC         ACCCC         STTAGCGTTAACTGGCAGI         GGCAGCAG	>	<stemi -TTTG</stemi 	S-turn3' CAGTAGGT TAC-TAGTAGATGGGC CGTCAGTAGATC	Pseudoknot I Pseudoknot I Pseudoknot I 	Ia/b> F box	TAAAAAAGAG CAAGAG CTGACGGACG CTGACGGACG CCAATGAGGG CTGACGGACG CTTGAGCG CTTGAGCG CTTGAGCG -ATTAACCG AAAGAACGG -AACGAAGCG -AACGAAGCG AAACGAAGCG AAACGAAGCG GAATGAGCG GCATATGAGCG GCATATGAGCG GCAATGAGCG GAACGAACGG GAACGAACGG GAACGAACGG GAACGAAC
BsubGl BsubGl Apar Rxyl Falns Tfus Scoe Mmul Agra Adur Adur51 Agra Adur51 Adra Adur0 A0330 A0310 A0330 A0310 A0330 A0340 A0384 A0384 A0386 A0332 Ahae Blon Arthr Lxyl Blin Krad Janib Dical Spro Derm Nocar NBroad Pacn Stro Cdip Nfar Rhodo	<	StemII5'		<stemi TTTG</stemi 	S-turn3' CAGTAGGT 	Pseudoknot 1 Pseudoknot 1 TGCGGACGT-TCATC-A GGCCGGC-TTCG-CC GGCCGGC-TTCG-CC GGCCGGC-TCGGATC -CGACGGG-TCGGATC -CGACGGG-TCGGATC -CGACGGG-TGAGC-CC -GGACGG-TGAGC-CC -GGACGG-CGGG-CC -GGACGG-CGGG-CC -GGACGG-CGGGC-CC -GGACGG-ACGGC-CC -GGACGG-ACGGC-CC -GGACGG-ACGGC-CC -GGACGG-TCGGC-CC -GGACGG-TCGGC-CC -GGACGG-TCGGC-CC -GGACGG-TCGGC-CC -GGACGG-TCGGC-CC -GGACGG-TCGGC-CC -GGACGG-TCGGC-CC -GGACGG-TCGGC-CC -GGACGG-TCGGC-CC -GGACGG-TCGGC-CC -GGACGG-TCGGC-CC -GGACGG-TCGGC-CC -GGACGG-TCGGC-CC -GGACGG-TCGGC-CC -GGACGG-TCGGC-CC -GGACGG-TCGGC-CC -GGACGG-TGGGC-CC -GGACGG-TGGGC-CC -GGACGG-TGGGC-CC -GGACGG-TGGGC-CC -GGACGG-TGGGC-CC -GGACGG-TGGGC-CC -GGACGG-TGGGC-CC -GGACGG-TGGGC-CC -GGACGGC-TGGC-CC -GGACGGC-TGGC-CC -GGACGGC-TGGCCC -GGCCGCCCC -GGCCGCCCCC -GGCCGCCC -GGCCGCCCC -GGCCGCCCC -GGCCGCCC -GGCCCGC-TGGCCC -GGCCGCC -GGCCGCC -GGCCCGC -GGCCCGC -GGCCCGC -GGCCCGC -GGCCCGC -GGCCCC -GGCCCC -GGCCCC -GGCCCC -GGCCCC -GGCCCC -GGCCCC -GGCCCC -GGCCCC -GGCCCC -GGCCC -GGCCC -GGCCC -GGCCC -GGCCC -GGCCC -GGCCC -GGCCC -GGCCC -GGCCC -GGCC	Ia/b> F box	TAAAAAAGAG CAAGAG CCACGGAGCG CTACGGAGCG CCAACGACTG CCAATGAGCG AGGAAGCG ATGAACG ATTAAGCG AAATAAAGAAGCG -AACGAAGCG -AACGAAGCG -AACGAAGCG -CAACGAAGCG GAATGAACCG GCAATGACG GCAATGACG GCAATGACG GCAACGAAGCG GAACGAAGCG GAACGAAGCG GAACGAAGCG CAACGAAGCG GAACGAAGCG CAACGAAGCG CAACGAAGCG CAACGAAGCG CAACGAAGCG CAACGAAGCG CAACGAAGCG CAACGAAGCG CAACGAAGCG CAACGAAGCG CAACGAAGCG CAACGAAGCG CAACGAAGCG CAACGAAGCG CAACGAAGCG CAACGAAGCG CAACGAAGCG

Fig. S1. (Continued)

	<>	<stemiii3'< th=""><th>&gt;</th><th>&lt;&gt;</th><th>AT5' o</th><th>r AASD5'</th><th>&gt; &lt;</th><th>AT3' or A</th><th>ASD3'&gt;</th></stemiii3'<>	>	<>	AT5' o	r AASD5'	> <	AT3' or A	ASD3'>
BsubGl	VGCTGGGATTTTGT	-TCTC	-AGCAA	CTAGGGT	SGAACC-G	CGGGA	GAAC	тстсс	тссста-
Bsub	GAAAAAGTGTATGCT	-TGCTTT		AAAGGGT	SGTACC-G	CGAGA	TAAGCTT	TCTCG	TCCCTTA
Anar	ACGGACATA	-TC	CGTC-	GCTGGGT(	SGTTACA	CGAAGTGT	ATTGTG-	GCGCTTCG	TCCCAGC
Ryvl	GTCCGGGGCCGCA	-6600706	GGCAA	GCAGGGT	SGTACC-G	CGAGAGCCCCCTTC	TTT-GGAG		TCCCTGC
Faln		-6697066-0068600666606	-TGCAA	GGAGGGT	SGTACC-G	CGGTACCCCCG	G2	CCGGTGAGGCGTCG	<u>т</u> ссстсс
Tfus	GGGCGCGCGGCAGGACGA		GCCAA	GGAGGGT	SGTACC-G	CG <u>GGG</u> C	GTCT		<u>T</u> CCCTCC
Scoe	GGCTCG-CCGGAGCACACGAC	-6CACC66CC66	GCCAA	GGAGGGT	SGTACC-G	CGGGAGC	ACG	GCTCTCG	TCCCTCC
Mm11]	GCTCGCTTCCAGAAACTGGGCAAG3-AAA	ACCAG-ACCCGGCAGCG	AGCAA	GCGAGGT	GGTACC-G	2222222222222	AAACA	GTGACGGGCG	TCCTCGT
Mour43	OGCT-CACTTGGTCGCCTGCA-TAGTTTG4	-CAGACTACGACAGCACCACGTG-	CGCAA	GCGAGGT	GGTACC-G	CGTCCACCGACA-	AAG	TGTCGG=AGGCG	TCCTCGT
Mour51	3GCT-CACTTGGTCGCCTGCA-TAGTTTG5	-CGGACTACGGCAGCATCACGTG-	AGCAA	GCGAGGTO	GGTACC-G	CGTCCACCGACA-	AAG	TGTCGG-AGGCG	TCCTCGT
Agra	GCTTTGGCT-GCTAGCTGCAAGGCCCCACC	-GGGCTTTGCGTGGCTGGCTAGCT-(	3-GGCAA	GCGAGGTO	GGTACC-G	CGGCTAAAAGCTG	GCC-TTAG	GGTTAGCTT-GGGTCG	TCCTCGT
Atur	GCTTTGCT-CCTGCGGCGCGCAC	-GCATCG-GGGTGGTAG	-AGCAA	CCCCCCT	GGTACC-G	CGGGTCCCAGT	GAA	GCTGGTCCTCG	TCCCTGT
Aodo 30	9600	-666-A6C	GGCAA	CCCCCCT	GGTACC-G	CGGGTGCCGGC	GAC	GCCGGTCCTCG	<u> </u>
A0310	GCCGCGCCTTCG	-66A6C	GGCAA	CGGGGGT	GGTACC-G	CGGGTGCCGGC	GAC	GCCGGTCCTCG	TCCCTGT
A0338	GCCGCGCCA	-6060	GGCAA	CGGGGGT	GGTACC-G	CGGGTCCCGGC	GTC	GCCGGTCCTCG	TCCCTGC
Acol	GCTTTTGTGAAAC	-TGCAGA	AGCAA	GCGAGGTO	GGTACC-G	CGCAGCGATACTG	ATAC	CAGTA-CGCGACG	<u>т</u> сст <u>с</u> ее
Auro	GTCGCGCCTCGT	- <u>6C6C</u>	GGCAA	GCGAGGTO	GGTACC-G	CGGTACCGC-CCG	СССТ6	-AGGGAGGTGCGGCGTCG	TCCTCGT
A0400	GTCCOGOGCCGTCCTCGCCACCT	-GGCGCTGAC-ACGCGG	GGCAA	GCGAGGTO	GGTACC-G		CCG-7		TCCTCGT
A0384	GTCGTGCACACCGTCCCTCTC	-GGGGGCGCGCGCAC	GGCAA	GCGAGGT	GGTACC-G	CGGTG-CGGCA-C	CAGC8	-GTCGGGAGCCGACGTCG	TCCTCGT
A0386	GTCGTGCAGGT-CGTCCCGGTC	-GGGGCGCGC-GGCAC	GGCAA	GCGAGGTO	GGTACC-G	CORDE-COCC	A-GC9	-GCCGGGAGCCGTCGTCG	TCCTCGT
A0332	GCCACGCATCGC	-6066	GGCAA	CCCCCCTC	GGTACC-G	CGGCTTAAGGC	AACC	GCTGAGAGTCG	<u>т</u> ссто <u>с</u> с
Ahae	GCCACGCCACAGAACTTCACCCCGCG	-GGG=CAAGTCCT=TGGTTT======	GGCAA	GCGAGGT	GTACC-G	CGCGTAAA-CACT	CCAA	GGTGGAATATGCG	<u>т</u> сстсес
Blon	GTCGCGCAGGCT-CGCGGCTCCGAGTGCAACAGT	-TCGGAGCGCCCAACCGGTGC	-GATAA	GCGAGGTO	GTACC-G	COGTO-COGAOCO	CATACCA-	GCGC-CCGTCATCG	TCCTCGT
Arthr	GCCGACGCCGGTGCTCCCTCAAAC	-GGGGG-TGCGGCGAC	GGTAA	GTGAGGT	GGTACC-G	CGGTGCCGGT-GC	TGTTGCAA	-AACAGCGTACGG-GCCG	<u>т</u> ссто <u>с</u>
Lxvl	GCCTCATCCGGTGTCGTG	-GCCGGAAGG	GGCAA	GCGGGGT	GGTACC-G	CGACGGTCGC	GACA	GCGTCCGGCG	TCCTCGT
Blin	ATCCTCCGAT-CGTCTGTCTCATCC	-GACAGACGTTCACGGCG	GATAA	GCGAGGT	GGTACC-G	CGGCA	GACA	TGTCG	<u>TCCTCGT</u>
Krad	GTCGTCGTCGCCA-CCCCTCC	-GGGGAGGGCGGGGTC	GGCAA	GCGGGGT	GGTACC-G	CGGCACC-GCCG-	GCCC	cggcgggtgtcg	TCCTCGT
Janib	GTTGTATCTCCAGTGTCACAGCA	-TGTTCGAC-CTGGAAATGC	GGCAA	GCGGGGT	GGTACC-G	CGGTGCCGCCGGG	ATCGA	TCCCGGTGACGTCG	TCCTCGA
Ical	GTCGTATG-CCGC-TG-GGCTCGCTTTC	-CGGGTCACGCGCGGTCGTGC	GGCAA	GCGGGGT	GGTACC-G	CGGCGGAGCT	CACG	GGTGACGTCG	TCCTCGT
Spro	GTGCGACGCACACGGCAGCCATCCA-	-GCCGGGCGTCG	CGCAA	GCGAGGT	GGTACC-G	CGGTGCCGACCGG	GCGTCATA	CCCCGG-CAGCGTCG	TCCTCGT
Derm	GTC-ATGTCGCTCCTCGTGCGCCCGCCAC	-CGGGCGAGAGCGCGGG-TTCGAGAT	-GGCAA	GCAAGGT	GGTACC-G	CGGCCAC-CCGGC	ACAC	GCCGGCGACGTCG	TCCTTGC
Nocar	GTCCCTTCG	-GG	GGCAA	GCAGGGT	GGTACC-G	CGGTC	CTCG	GATCG	TCCCTGC
NBroad	GCCCAGGCA	-TG		GCAGGGT	GGTACC-G	CGGTC	GCAA	GATCG	TCCCTGT
Pacn	GCCGACGTCGTT	-GACGTCG	TGCAA	GGAGGGT	GGTACC-G	CGGGTAC-CCGGA	GAA	TCCGGTGTGCTCG	TCCCTCG
Stro	GGCGGTCGATCCT	-GGCC	GCCAA	GCGGGGT	GGTACC-G	CGGGCCCTGCCCC	GG10	CCGGAGC-GGGTTCG	TCCTCGC
Cdip	GAGC-TTACATCAGATGCC	-TCTGGTGGAATG	CTCAA	GCGGGGT	GGTACC-G	CGCG	GAAA	CGCG	TCCCCGC
Nfar	GTCCGGTGCGTCCGA	-cgccg	GACAA	ACGGGGT	GGTACC-G	CGGTTTCGGCGC-	ACCGG	GCGCCGAGGTCG	TCCCCGT
Rhodo	GCGCCCTCCG	-GGG	TGCAA	GCGGGGT	GGTACC-G	CGGTGGTGACGC-	AGGAG	GCGTCTCCGTCG	TCCCCGT
Mtub	GCCGCGCATCG	-GCG <u>T</u>	GGCAA	GCGGGGT	ggtacc- <u>g</u>	CGGCGTTCGCGC-	ACCG	GCG <u>T</u> G- <u>G</u> CG <u>T</u> CG	TCCCCGA

Б	<terminator5' asd5'<="" or="" th=""><th>&gt; <terminator3' c<="" th=""><th>or ASD3'&gt;</th></terminator3'></th></terminator5'>	> <terminator3' c<="" th=""><th>or ASD3'&gt;</th></terminator3'>	or ASD3'>
	ASD		SD ATG
BsubGly	/CTCTCGTCCCTATGTTTGC	GGCTG	GCAAGCATAGAGACGGGAGTTTTTTGGT
Bsub	GCTTTCTCGTCCC	TTAT	GGGATGAGAGGGCTTTTTTATTTT
Apar	GCGCTTCGTCCC	AGCTGTGA	GGGACGG-GCGCTTTATTT
Rxyl	-AAAGAG-GGCTCCCGTCCCTGCGGCC	GGAGA	GGTCGCCGGGGCGGGAGCCTGGCTTTT
Faln	GTCGTCCCTCCGTTG	GTCCGACGCCAGCCA	CGACCGAGG-AAGACCGGGTCCGTCACGATG
Tfus	CGTCCCTCCGTCAGGTG	ACCAGCA	CCCCTGATGGAAAGGTACGCCAC <b>GTG</b>
Scoe	CCTCCGACGGAAG	GCAGCA	CGTCCGCCGGAGGAAGCTCGCTG <b>ATG</b>
Mmul	CGTCCTCG	TGACCAACACGACCAG	CGAGGACGAA <b>ATG</b>
Mcur430	)CGTCCTCGTGAAT	GAACG	ATTCGCGATAAGGACGAAG <b>ATG</b>
Mcur513	3CGTCCTCGTGAAT	GAGCG	ATTCGCGATAAGGACGAAG <b>ATG</b>
Agra	CCTCGTGA	CAAGGATCG	TCAAGAGGCAAA <b>ATG</b>
Atur	GTCCTCGTCCCTGT	GAATCGA	ACAGACGAGGACAACA <b>ATG</b>
Aodo309	GTCCTCGTCCC	TGTATAGGCGC	GAGACGAGGACACTC <b>ATG</b>
A0310	GTCCTCGTCCC	TGTATAGGCGC	GAGACGAGGACACTCATG
A0338	CGGTCCTCGTCCCTGCGC	ACG	GCGCAA-CACGAGGACTGCC <b>ATG</b>
Acol	CGTCCTCGG	AAAAGAAGAATAAGCGCAAACGCTGGCAGGCTAA	CAAGCCCGCCCTACCGAGGACGAAAAAGGA <b>ATG</b>
Auro	GT-CCTCGTG	AGACACGGTTGTTCACGAGCACGA	CGCGAGGCACCCCATG
A0400	TCGTCCTCGTG	GCATGCAGATGTTCACGAGTGAGA	TGCGAGG-CGAGACTCCG <b>ATG</b>
A0384	GTCCTCGTCAGGC	CCCGGGCACCCGCCCGAGGCGGCAGGAACGA	GTGAGACGAGAGCACACCGCGATG
A0386	GTCGTCGTCCTCGTC	AGGTCCCGGGCACCCGCCCGGGGCGGCAGGAACG	GAGTGAGACGAGAGC-AC-ACCGCGATG
A0332	GTCG-TCCTCG	CTCGGGCGATGTA	TGAGGAGCAACA <b>ATG</b>
Ahae	TCCTCGCCTGA	CCAAACA	TCATGAGGAGTTCTCTT <b>ATG</b>
Blon	C-ATCGTCCTCGTAGGCAGGAACGGCAGACAGGGCTGT	TCCGGGCCAGTC-	AGTTCC-GGCTGCGAGG-CGA <b>TTG</b>
Arthr	CGTCCTCG-CATCCTGAA-TGATCCACT	TGTTC	ACTAGCTCAACCCAGGATGTCGAG-ATG
Lxyl	TCC-GGC-GTCCTCGT	GCAGAACA	GCGAAAACTGCCAGGAGAGAAATG
Blin	CATGT-CGTCCTCGTGACAGTGAC	CGCA	GTGACTCAAAAGGACGCTCATG
Krad	TGTCGTCCTCGTGGCTGGA	GCAG	TTCAGTCG-GAGGA-GACGACGTG
Janib	GATCAGCAGGAGCGACGTC	AGTACAGGCGGCGC-	AGC-GATCGAGTAGAGGACGAGACGACGATG
Ical	-CACGGGTGAC-GTCGTCCTCGTG	AACGAGATCCCACGAGCAGTCCGAACCACGCAG-	CAGCAGGA-GACCACGACCCATG
Spro	GTCGT-CCTCGTGG	CAGCACGACCACGACTCGACCGCACGCGACAC	CTCCCAGGAGCCACCGACATG
Derm	CGTCCTT-GCTCG	ACGATCTGA	CGCGCAAAGGATGCCACC <b>ATG</b>
Nocar	ATCGTCCCTGCGGT	GGAGGATCGACCGA	ACCGCAGGAGCCCAG <b>ATG</b>
NBroad	CGTC-CCTG-TGG	AAGACGAAACCCACACACCAC	CCAGCAGGAGATGCCGCCG <b>ATG</b>
Pacn	CGGTGTGCTCGTCCCTCG	GTGACCCGAGA	CGAAGGAC-CACCCGCTGCGATG
Stro	GGGTT-CG-TCC-TCGCAG	ACCCACGAAGAGTGAG	CTGCGAAGGAGCGCGACCCCCCGATG
Cdip	TCCCCG-CACTTTAAGGCA	GAA	-TGCTTGCGAAAGTGAAGGAGAAAA <b>ATG</b>
Nfar	GTCGTCCCCGTGCCCACAGACACGCGCC	CTGCGGCGCG	GTGGCACGAGGA-GACGCATCCGCGATG
Rhodo	GCG-TCTCCGTCGTCCCCG	TGCCGAGTACGT	CAGGCACGA-GGAGATCGCG <b>GTG</b>
Mtub	GCGTCGTCCCCGAGCCTGGATTGCA-GGCAC	GCAGTGCCGA	ACGGTGCTGGGGCCTGGGGGGGGCGCGCGCGCAAAGTG

**Fig. 51.** Alignment of Actinobacteria *ileS* leader regions that represent various classes of structure and possible regulatory mechanisms. The *B. subtilis glyQS* and *ileS* sequences are shown for comparison. (A) Alignment of sequences that extend from 15 nt 5' of the GA motif through the antisequestrator helix (or antiterminator). (B) Alignment of sequences that form the sequestrator helix (or terminator) extending through the ATG for translationally controlled genes (or the run of T's for transcriptionally controlled genes). The 3' side of the antisequestrator helix (or antiterminator) in *A* is partially repeated within the 5' side of the sequestrator helix (or terminator helix (or terminator) he and of the sequestrator helix (or terminator) in *B*. Dashed arrows at the top indicate helical regions, and the same colored sequences indicate paired regions. Helical regions are aligned at each end of the paired region with a spacer, and colored dashes are inserted for alignment based on conserved sequences. A black base within a helical area means that this base does not have a counterpart on the opposite side of the helix. A black dash in a helix means there is an extra base opposite to this location in the other side of the helix. In Rxyl, there is an extra helix after the pseudoknot: GGGTGTCCCGCCGCCACCC; in Faln, there is an additional sequence at the top of the

Legend continued on following page

antisequestrator helix: TCCCGGGCGGGACG-CGG-CGGCGGGCAGGCCGTCGGCCGTCGTCACGC-GCGG; in Mmul, there are two extra helices in stem III: TTCGGG ACT-TGAAACCTTTGCCAGGGAAACC-GGCAAGCACCTCATGAACCCGAAACCAGATGGGCACGGGACATGAACGCCGCCGGGAATACCGGGTGGCGCCTCATGAACTC-ACCATC; in Mcur43063, there is an additional sequence at the top of stem III: ACCGCACCGGATAGGTCGG-CGCC; in Mcur51333, there is an additional sequence at the top of stem III: ACCGCACCGGATAGGTCGG-CGCC; in Auro, there is an additional sequence at the top of the antisequestrator helix: CG-GCC-TGCCAGGGCACG; in A0400, there is an additional sequence at the top of the antisequestrator helix: TCGTCGGCCACCGGCCGGCG; in A0384, there is an additional I sequence at the top of the antisequestrator helix: CGGGCACCAGGCCCG; in A0386, there is an additional sequence at the top of the antisequestrator helix: CGG-ACGCCAGTCCCG; in Stro, there is an additional sequence at the top of the antisequestrator helix: CACGCCGACGCGT-. Acol, Actinomyces coleocanis Difco Sporulation Media (DSM) 15436; Agra, Actinomyces graevenitzi C83; Ahae, Arcanobacterium haemolyticum DSM 20595; Aodo309, Actinomyces odontolyticus F0309; A0310, Actinomyces sp. oral taxon 180 str. F0310; A0332, Actinomyces sp. oral taxon 848 str. F0332; A0338, Actinomyces sp. oral taxon 178 str. F0338; A0384, Actinomyces sp. oral taxon 175 str. F0384; A0386, Actinomyces sp. oral taxon 170 str. F0386; A0400, Actinomyces sp. oral taxon 448 str. F0400; Apar, Atopobium parvulum DSM 20469; Arthr, Arthrobacter sp. FB24; Atur, Actinomyces turicensis ACS-279-V-Col4; Auro, Actinomyces urogenitalis DSM 15434; Blin, Brevibacterium linens BL2; Blon, Bifidobacterium longum; Bsu, B. subtilis; Cdip, Corynebacterium diphtheriae; Derm, Dermacoccus sp. Ellin 185: Faln, Frankia alni ACN14a: Ical, Itrasporangium calvum DSM 43043; Janib, Janibacter sp. HTCC2649; Krad, Keneococcus radiotolerans SRS30216; Lxvl. Leifsonia xyli subsp. xyli str. CTCB07; Mcur430, Mobiluncus curtisii American Type Culture Collection (ATCC) 43063; Mcur513, Mobiluncus curtisii ATCC 51333; Mmul, Mobiluncus mulieris FB024-16; Mtub, M. tuberculosis; NBroad, Nocardioidaceae bacterium Broad-1; Nfar, N. farcinica IFM 10152; Nocar, Nocardioides sp. JS614; Pacn, Propionibacterium acnes; Rhodo, Rhodococcus sp. DK17; Rxyl, Rubrobacter xylanophilus DSM 9941; Scoe, S. coelicolor A32; Spro, Serinicoccus profundi Marine Culture Collection of China (MCCC) 1A05965; Stro, Salinispora tropica CNB-440; Tfus, Thermobifida fusca YX.



Fig. S2. Modified phylogenetic tree of species from the phylum Actinobacteria labeled with types of Stem I found in the *ileS* leader sequences (1, 2). Numbers in parentheses are the percentage of G + C genome contents (1–4).

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2. Gillespie JJ, et al. (2011) PATRIC: The comprehensive bacterial bioinformatics resource with a focus on human pathogenic species. Infect Immun 79(11):4286–4298.

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4. Xiao J, Luo Y, Xu J (2011) Genome sequence of Serinicoccus profundi, a novel actinomycete isolated from deep-sea sediment. J Bacteriol 193(22):6413.

## Table S1. Actinobacteria genera grouped by Stem I class of the T box riboswitch found in the *ileS* gene

No T box riboswitches	Canonical T box riboswitches	USSR T box riboswitches	US T box riboswitches
Acidimicrobium	Atopobium	Actinomyces	Actinomyces
Acidothermus	Catenulispora	Mobiluncus	Actinosynnema
Aeromicrobium	Collinsella		Amycolatopsis
Blastococcus	Coriobacterium		Amycolicicoccus
Candidatus	Frankia		Arcanobacterium
Conexibacter	Nocardiopsis		Arthrobacter
Cryptobacterium	Olsenella		Beutenbergia
Eggerthella	Propionibacterium		Bifidobacterium
Geodermatophilus	Rubrobacter		Brachybacterium
Modestobacter	Streptomyces		Brevibacterium
Patulibacter	Streptosporangium		Cellulomonas
Segniliparus	Thermobifida		Clavibacter
Slackia	Thermobispora		Corynebacterium
Tropheryma	Thermomonospora		Dermacoccus
	Kitasatospora		Dietzia
	·		Gardnerella
			Gordonia
			Intrasporangium
			Janibacter
			Jonesia
			Kineococcus
			Kocuria
			Kribbella
			Kvtococcus
			Leifsonia
			Microbacterium
			Micrococcus
			Micromonospora
			Mvcobacterium
			Nakamurella
			Nocardia
			Nocardioidaceae
			Nocardioides
			Parascardovia
			Propionibacterium
			Pseudonocardia
			Renibacterium
			Rhodococcus
			Rothia
			Saccharomonospora
			Salinispora
			Sanguibacter
			Scardovia
			Stackebrandtia
			Tsukamurella
			Verrucosisnora
			Xvlanimonas
			, yuu iiii onas

PNAS PNAS

## Table S2. Generation of the plasmid vectors and DNA oligonucleotides used in PCR

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DNA template	Generation of plasmid vectors	PCR primers
N. farcinica ileS	PCR using ligation reaction as a template and	tRNA-binding reactions:
	5'-TTTATATGATCATTTACGAGGGAGACGGCGACGATCCGGCCA- TC-3' and	5'-TTCTCGAATTCTAATACGACTCACTATAGGCGAC- GATCCGGCCATCAC-3'
	5'-TAGCTGTCGACGCTGTCGTCCGCCATCGCGGATGCGCCTCCT-3' as primers	5'-ACGGGGACGGCCTCGGCGCCCGGTGC-3'
	PCR using <i>B. subtilis</i> chromosomal DNA as a template and	Primer extension reactions:
	5'-ATTAATCTAGATTACGAAGAATATTCGGGATTGTA-3' and	5'-TTCTCGAATTCTAATACGACTCACTATAGGCGAC- GATCCGGCCATCAC-3'
	5'-GCCGTCTCCCTCGTAAATGATCATATAAAAAGATGGACC-3' as primers	5'-TGCGGGCCTCTTCGCTATTACGCCA-3'
	PCR using products from both of the PCR above as template and	RNase H cleavage assays:
	5'-ATTAATCTAGATTACGAAGAATATTCGGGATTGTA-3' and	5'-cctaatgcaggagtcgcataaggg-3'
	5'-TAGCTGTCGACGCTGTCGTCCGCCATCGCGGATGCGCCTCCT-3' as primers	5'-CGATTAAGTTGGGTAACGCCAGG-3'
	Insert PCR product into plasmid pFG328 using Xbal, Sall	
A8G N. farcinica ileS	No plasmid generated	5'-ATATAATACGACTCACTATAGGCGACGGTCCGGC- CATCACCGGGGAGCCT-3'
		5'-ACGGGGACGGCCTCGGCGCCCGGTGC-3'
A16U N. farcinica ileS	No plasmid generated	5'-TTCTCGAATTCTAATACGACTCACTATAGGCGA- CGATCCGGCCTTCAC-3'
		5'-ACGGGGACGGCCTCGGCGCCCGGTGC-3'
<i>N. farcinica</i> tRNA <sup>lle</sup>	Insert ligation reaction product into plasmid pGEM7-S4P-tRNQ using Xmal, Ncol	
	Insert ligation reaction product into pGEM4 plasmid using	5'-GAGCGAGGAAGCGGAAGAGCGCCC-3'
N forcinico + DNA lleAACCA	XDal, PVUII No plasmid concreted	5' - TGGTGGGCCTAGGAGGA-3'
N. Tartinica trina "DACCA	No plasma generated	5 = TAATAUGAUTUAUTATAGUGUUTATAGUTUAG=3 5' = CCCCCCTDCCDCCDCTTCDD=2'
N farcinica tRNA <sup>lle</sup> Ex1C	No plasmid generated	
N. Iarcinica dillA Exic	No plasma generated	5'-GTGGTGGGCCTAGGAGGA-3'
<i>N. farcinica</i> U36A tRNA <sup>lle</sup>	Site-specific oligomutagenesis of the plasmid pGEM7-S4P-tRNQ with <i>N. farcinica</i> tRNA <sup>IIe</sup> template insert using	5'-TAATACGACTCACTATAGGGCCTATAGCTCAG-3'
	5'-GGTTAGAGCGCTTCGCTGAAAACGAAGAGGTCGGAGG-3' and	5'-TGGTGGGCCTAGGAGGA-3'
	5'-cctccgacctcttcgttttcagcgaagcgctctaacc-3' oligonucleotides	
Actinomyces sp. ileS	Insert ligation reaction product into pGEM4 plasmid using	5'-TAATACGACTCACTATAGG-3'
	Xbal, Pvull	5'-GCAGGGACGAGGACCGG-3'
Actinomyces sp. tRNA"	Insert ligation reaction product into pGEM4 plasmid using Xbal, Pvull	
S. coelicolor ileS	No plasmid generated	5'-TAATACGACTCACTATAGGCATGGATGGGGACG-3'
		5'-GGAGGGACGAGAGCCGTGCT-3'
S. coelicolor tRNA"	No plasmid generated	5'-ATATAATACGACTCACTATAGGGGGCTATAGCTCA-
		GTTGGTTAGA-3'
R subtilis + PNA Gly	No plasmid generated	
<b>D. SUDUIIS UNIA</b>	No plasma generated	5'-TGGAGCGGAAGACGGGATTCGAAC-3'
<i>B. sublitis</i> tRNA <sup>Val</sup>	PCR using <i>B. subtilis</i> chromosomal DNA as a template and	
	5'-AATATTAATACGACTCACTATAGATTCCGTAGCTCAGCTGG-3'	
	5'-ATAATTCTAGAGCAATGCATGGTGATTCCGACTGGGCTCGAACC-3'	
	as primers Insert into pGEM4 plasmid using Xbal, Pvull	

Ncol, Pvull, Sall, Xbal, and Xmal are restriction enzymes purchased from New England Biolabs, Inc.

Table S3. DNA oligonucleotides used in primer extension reactions				
Oligonucleotide name	Sequence			
310–330 267–289	5'-cgctattacgccagctggcg-3' 5'-cgattaagttgggtaacgccagg-3'			