

Supplementary Data 1. List of plasmids used

Level 0 DNA Parts - Coding sequences

Addgene #	Part Name	Species of origin	Part content	Mutations	Codon optimisation	Compatibility with Assembly Systems	4 base pair overhangs on digestion with BspI		Source of plasmid	Reference for sequence
							5'	3'		
149770	piCSL90004	<i>Streptococcus pyogenes</i>	SpCas9-H (with stop codon)	none - wild type	human	MoClo, Loop	AATG	GCTT	Kamoun Lab	Nekrasov et al (2013) Nature Biotechnology
217520	piCSL90005	<i>Streptococcus pyogenes</i>	SpCas9-H (no stop codon)	none - wild type	human	MoClo, Loop	AATG	TTGC	Kamoun Lab	Nekrasov et al (2013) Nature Biotechnology
3117521	pEPOR1CB0013	<i>Streptococcus pyogenes</i>	SpCas9-φ (with stop codon)	none - wild type	plant	MoClo, GB, Loop	AATG	GCTT	this study	Fauser et al (2014) Plant Journal
4117522	pEPOR1CB0009	<i>Streptococcus pyogenes</i>	SpCas9-φ (no stop codon)	none - wild type	plant	MoClo, GB, Loop	AATG	TTGC	this study	Kleinistver et al (2015) Nature
5117523	pEPOR1CB0011	<i>Streptococcus pyogenes</i>	SpCas9-φ (no stop codon)	D1135E	human	MoClo, Loop	AATG	TTGC	this study	Slyamaker et al (2015) Science
6117524	pEPOR1CB0014	<i>Streptococcus pyogenes</i>	SpCas9-KA (with stop codon)	K855A	human	MoClo, Loop	AATG	GCTT	this study	Slyamaker et al (2015) Science
7117525	pEPOR1CB0015	<i>Streptococcus pyogenes</i>	SpCas9-KA (no stop codon)	K855A	human	MoClo, Loop	AATG	TTGC	this study	Slyamaker et al (2015) Science
8117526	pEPOR1CB0016	<i>Streptococcus pyogenes</i>	Sp-eCas9 1.0 (with stop codon)	K810A, K1003A, R1060A	human	MoClo, Loop	AATG	GCTT	this study	Slyamaker et al (2015) Science
9117527	pEPOR1CB0017	<i>Streptococcus pyogenes</i>	Sp-eCas9 1.0 (no stop codon)	K810A, K1003A, R1060A	human	MoClo, Loop	AATG	TTGC	this study	Slyamaker et al (2015) Science
10117528	pEPOR1CB0018	<i>Streptococcus pyogenes</i>	Sp-eCas9 1.1 (with stop codon)	K848A, K1003A, R1060A	human	MoClo, Loop	AATG	GCTT	this study	Slyamaker et al (2015) Science
11117529	pEPOR1CB0019	<i>Streptococcus pyogenes</i>	Sp-eCas9 1.1 (no stop codon)	K848A, K1003A, R1060A	human	MoClo, Loop	AATG	TTGC	this study	Slyamaker et al (2015) Science
12117530	pEPOR1CB0020	<i>Streptococcus pyogenes</i>	Sp-eCas9 3.7 (no stop codon)	E543D, M694I, E1219V	human	MoClo, Loop	AATG	TTGC	this study	Hu et al (2018) Nature
13117531	pEPOR1CB0020	<i>Staphylococcus aureus</i>	SaCas9 (with stop codon)	none - wild type	human	MoClo, GB, Loop	AATG	GCTT	Ran et al (2015) Nature	
14117532	pEPOR1CB0021	<i>Staphylococcus aureus</i>	SaCas9 (no stop codon)	none - wild type	human	MoClo, GB, Loop	AATG	TTGC	this study	Ran et al (2015) Nature
15117533	pEPOR1CB0022	<i>Staphylococcus aureus</i>	eSaCas9 (no stop codon)	R495A, C500K, R554A, G655R	human	MoClo, GB, Loop	GGAG	ATTC	Patton Lab	Lawrenson et al (2015) Genome
16117534	pEPOR1CB0007	<i>Lachnospiraceae bacterium</i>	LbCas12a (with stop codon)	none - wild type	human	MoClo, GB, Loop	GGAG	ATTC	this study	Kleinistver et al (2016) Nature Biotechnology
17117535	pEPOR1CB0008	<i>Acidimicrobium sp. BV3L6</i>	AcCas12a (with stop codon)	none - wild type	human	MoClo, GB, Loop	AATG	TTGC	this study	Kleinistver et al (2016) Nature Biotechnology
18117536	piCSL50005	<i>Aequorea victoria</i>	c-term tag YFP	G65S, L68V, A72S, Y203T, L231H	none	MoClo, GB, Loop	TTGC	GCTT	Nagai et al (2002) Nature Biotechnology	

note:
 MoClo compatible - absence of BsaI/BspI internal sites
 GB compatible - absence of BsaI and BsmBI internal sites
 Loop compatible - absence of BsaI and SspI internal sites

Level 0 DNA Parts - Regulatory sequences

Addgene #	Plasmid name	Species of origin	Part content	Mutations	Codon optimisation	Compatibility with Assembly Systems	4 base pair overhangs on digestion with BspI		Source of plasmid	Reference
							5'	3'		
1950269	piCHS1288	Caulliflower Mosaic Virus / Tobacco Mosaic Virus	2x35S_β (promoter + 5'UTR)	n/a	n/a	MoClo, GB, loop	GGAG	AATG	Marillionet Lab	Engler et al (2014) ACS-Syn Bio
2062824	piCHS1289	<i>Arabidopsis thaliana</i>	N-UE-26 (promoter)	n/a	n/a	MoClo, GB, loop	GGAG	ATTC	Patton Lab	Lawrenson et al (2015) Genome
2150339	piCH41421	<i>Agrobacterium tumefaciens</i>	Nos (3'UTR + terminator)	n/a	n/a	MoClo, GB, loop	GCTT	CGCT	Marillionet Lab	Engler et al (2014) ACS-Syn Bio

Level 1 Assemblies - protein expression cassettes

Addgene #	Plasmid name	Promoter/5'UTR	Content			3'UTR/TERM	Acceptor	4 base pair overhangs on digestion with BspI		Source of DNA part
			CDS	CTAG				5'	3'	
22117542	piCSL11023	2x35S_β (piCHS1288)	SpCas9-H (no stop codon) (piCSL90005)	YFP (piCSL50005)	Nos (piCH41421)	piCH47742	GCAA	ACTA	Kamoun Lab	
23117543	pEPOR1CB0002	2x35S_β (piCHS1288)	SpCas9-φ (no stop codon) (pEPOR1CB0009)	YFP (piCSL50005)	Nos (piCH41421)	piCH47742	GCAA	ACTA	this study	
24117544	pEPOR1CB0008	2x35S_β (piCHS1288)	SpCas9-φ (no stop codon) (pEPOR1CB0011)	YFP (piCSL50005)	Nos (piCH41421)	piCH47742	GCAA	ACTA	this study	
25117545	pEPOR1CB0009	2x35S_β (piCHS1288)	SpCas9-K855A (no stop codon) (pEPOR1CB0015)	YFP (piCSL50005)	Nos (piCH41421)	piCH47742	GCAA	ACTA	this study	
26117546	pEPOR1CB0010	2x35S_β (piCHS1288)	Sp-eCas9 1.0 (no stop codon) (pEPOR1CB0017)	YFP (piCSL50005)	Nos (piCH41421)	piCH47742	GCAA	ACTA	this study	
27117547	pEPOR1CB0011	2x35S_β (piCHS1288)	Sp-eCas9 1.1 (no stop codon) (pEPOR1CB0019)	YFP (piCSL50005)	Nos (piCH41421)	piCH47742	GCAA	ACTA	this study	
28117548	pEPOR1CB0012	2x35S_β (piCHS1288)	Sp-eCas9 3.7 (no stop codon) (pEPOR1CB0021)	YFP (piCSL50005)	Nos (piCH41421)	piCH47742	GCAA	ACTA	this study	
29117549	pEPOR1CB0013	2x35S_β (piCHS1288)	LbCas12a (with stop codon) (pEPOR1CB0007)	none	Nos (piCH41421)	piCH47742	GCAA	ACTA	this study	
30117550	pEPOR1CB0014	2x35S_β (piCHS1288)	AcCas12a (with stop codon) (pEPOR1CB0008)	none	Nos (piCH41421)	piCH47742	GCAA	ACTA	this study	
31117551	pEPOR1CB0015	2x35S_β (piCHS1288)	eSaCas9 (no stop codon) (pEPOR1CB0022)	YFP (piCSL50005)	Nos (piCH41421)	piCH47742	GCAA	ACTA	this study	
32117552	pEPOR1CB0013	2x35S_β (piCHS1288)	eSaCas9 (no stop codon) (pEPOR1CB0022)	YFP (piCSL50005)	Nos (piCH41421)	piCH47742	GCAA	ACTA	this study	

note:
 piCH47742 = AddGene #48001

Level 1 Assemblies - RNA expression cassettes

Addgene #	Plasmid name	Promoter	Content			Acceptor	4 base pair overhangs on digestion with BspI		Source of DNA part
			Spacer Sequence	Target gene	RNA scaffold		5'	3'	
33117553	pEPOR1CB0014	AtU6-26 (piCSL90002)	gcgcttaatttgagagtcctc	NBPDS1	sgRNA (SpCas9)	piCH47751	ACTA	TTAC	this study
34117554	pEPOR1CB0018	AtU6-26 (piCSL90002)	gcgcttaatttgagagtcctc	NBPDS1 - mutant1	sgRNA (SpCas9)	piCH47751	ACTA	TTAC	this study
35117555	pEPOR1CB0019	AtU6-26 (piCSL90002)	gcgcttaatttgagagtcctc	NBPDS1 - mutant2	sgRNA (SpCas9)	piCH47751	ACTA	TTAC	this study
36117556	pEPOR1CB0020	AtU6-26 (piCSL90002)	gcgcttaatttgagagtcctc	NBPDS1 - mutant3	sgRNA (SpCas9)	piCH47751	ACTA	TTAC	this study
37117557	pEPOR1CB0021	AtU6-26 (piCSL90002)	gcgcttaatttgagagtcctc	NBPDS1 - mutant4	sgRNA (SpCas9)	piCH47751	ACTA	TTAC	this study
38117557	pEPOR1CB0022	AtU6-26 (piCSL90002)	gcgcttaatttgagagtcctc	NBPDS1	sgRNA (SpCas9) - extended stem+U6-26 terminator	piCH47751	ACTA	TTAC	this study
39117538	pEPOR1CB0023	AtU6-26 (piCSL90002)	gcgcttaatttgagagtcctc	NBPDS1	sgRNA (SpCas9)	piCH47751	ACTA	TTAC	this study
40117558	pEPOR1CB0027	AtU6-26 (piCSL90002)	gtatcttggcctgaagctg	synthetic	sgRNA (SpCas9)	piCH47751	ACTA	TTAC	this study
41117540	pEPOR1CB0028	AtU6-26 (piCSL90002)	acgtatcttggcctgaagctg	synthetic	crRNA (AcCas12a)	piCH47751	ACTA	TTAC	this study
42117541	pEPOR1CB0029	AtU6-26 (piCSL90002)	acgtatcttggcctgaagctg	synthetic	crRNA (LbCas12a)	piCH47751	ACTA	TTAC	this study
43117538	pEPOR1CB0058	AtU6-26 (piCSL90002)	gtatcttggcctgaagctg	synthetic	sgRNA (SaCas9)	piCH47751	ACTA	TTAC	this study
44117559	pEPOR1CB0071	AtU6-26 (piCSL90002)	gtgcaaaaggcaaaagccat	RP54A family protein (AT5G58420)	sgRNA (SpCas9)	piCH47751	ACTA	TTAC	this study
45117560	pEPOR1CB0075	AtU6-26 (piCSL90002)	gggaagatacaaaagccat	Rps2/Psm01 subunit (AT3G32730)	sgRNA (SpCas9)	piCH47751	ACTA	TTAC	this study
46117561	pEPOR1CB0081	AtU6-26 (piCSL90002)	ggagatgacccaagagctc	AMPK19 (AT3G14720)	sgRNA (SpCas9)	piCH47751	ACTA	TTAC	this study
47117562	pEPOR1CB0083	AtU6-26 (piCSL90002)	gctgatgacccaagagctc	Methyltransferase (AT5G10620)	sgRNA (SpCas9)	piCH47751	ACTA	TTAC	this study
48117563	pEPOR1CB0084	AtU6-26 (piCSL90002)	ggcctactgacccaagagctc	AIJCP34 (AT5G19360)	sgRNA (SpCas9)	piCH47751	ACTA	TTAC	this study
49117564	pEPOR1CB0089	AtU6-26 (piCSL90002)	gtgagccttgaagagagagc	UJAT1 (AT5G04160)	sgRNA (SaCas9)	piCH47751	ACTA	TTAC	this study
50117565	pEPOR1CB0090	AtU6-26 (piCSL90002)	gtgagccttgaagagagagc	AT1G68250	sgRNA (SpCas9)	piCH47751	ACTA	TTAC	this study
51117566	pEPOR1CB0092	AtU6-26 (piCSL90002)	gtgagccttgaagagagagc	ATC66 (AT5G04770)	sgRNA (SpCas9)	piCH47751	ACTA	TTAC	this study
52117567	pEPOR1CB0103	AtU6-26 (piCSL90002)	gagctacatcgcatacaatt	AtCa6 (AT5G04770)	sgRNA (SpCas9)	piCH47761	TTAC	CAGA	this study
53117568	pEPOR1CB0093	AtU6-26 (piCSL90002)	ggagccttgaagagagagc	AtIPCS1 (AT5G54020)	sgRNA (SpCas9)	piCH47751	ACTA	TTAC	this study
54117569	pEPOR1CB0104	AtU6-26 (piCSL90002)	gtcatgtgagagagagagc	AtIPCS3 (AT5G54020)	sgRNA (SpCas9)	piCH47761	TTAC	CAGA	this study
55117570	pEPOR1CB0098	AtU6-26 (piCSL90002)	gagccttgaagagagagc	Flavin-binding monooxygenase family protein (AT1G62600)	sgRNA (SaCas9)	piCH47751	ACTA	TTAC	this study
56117571	pEPOR1CB0109	AtU6-26 (piCSL90002)	gattacagagagagagagc	Flavin-binding monooxygenase family protein (AT1G62590)	sgRNA (SaCas9)	piCH47761	TTAC	CAGA	this study
57117572	pEPOR1CB0099	AtU6-26 (piCSL90002)	gttcatgtgagagagagc	Protein kinase superfamily protein (AT1G73460)	sgRNA (SaCas9)	piCH47751	ACTA	TTAC	this study
58117573	pEPOR1CB0110	AtU6-26 (piCSL90002)	gagccttgaagagagagc	Protein kinase superfamily protein (AT1G73460)	sgRNA (SaCas9)	piCH47761	TTAC	CAGA	this study
59117574	pEPOR1CB0100	AtU6-26 (piCSL90002)	ggccttgaagagagagc	ENTH/ANT (AT1G14910)	sgRNA (SaCas9)	piCH47751	ACTA	TTAC	this study
60117575	pEPOR1CB0111	AtU6-26 (piCSL90002)	gtgagagagagagagc	ENTH/ANT (AT1G04160)	sgRNA (SaCas9)	piCH47761	TTAC	CAGA	this study

note:
 piCH47751 = AddGene #48002
 piCH47761 = AddGene #48003

Level 2 Assemblies

Addgene #	Plasmid name	Content				end linker	Acceptor	Source
		Position 1	Position 2	Position 3	position 4			
61117576	pEPOR2KN0001	piCHS4011	piCSL11023	pEPOR1CB0114	none	piCH41766	piCSL4723	this study
62117577	pEPOR2KN0002	piCHS4011	pEPOR1CB0022	pEPOR1CB0114	none	piCH41766	piCSL4723	this study
63117578	pEPOR2KN0003	piCHS4011	piCSL11023	pEPOR1CB0022	none	piCH41766	piCSL4723	this study
64117579	pEPOR2KN0004	piCHS4011	piCSL11023	pEPOR1CB0022	none	piCH41766	piCSL4723	this study
65117580	pEPOR2KN0008	piCHS4011	piCSL11023	pEPOR1CB0118	none	piCH41766	piCSL4723	this study
66117581	pEPOR2KN0009	piCHS4011	piCSL11023	pEPOR1CB0119	none	piCH41766	piCSL4723	this study
67117582	pEPOR2KN0010	piCHS4011	piCSL11023	pEPOR1CB020	none	piCH41766	piCSL4723	this study
68117583	pEPOR2KN0011	piCHS4011	piCSL11023	pEPOR1CB021	none	piCH41766	piCSL4723	this study
69117584	pEPOR2KN0012	piCHS4011	pEPOR1CB0008	pEPOR1CB0114	none	piCH41766	piCSL4723	this study
70117585	pEPOR2KN0013	piCHS4011	pEPOR1CB0011	pEPOR1CB0118	none	piCH41766	piCSL4723	this study
71117586	pEPOR2KN0014	piCHS4011	pEPOR1CB0008	pEPOR1CB0119	none	piCH41766	piCSL4723	this study
72117587	pEPOR2KN0015	piCHS4011	pEPOR1CB0008	pEPOR1CB020	none	piCH41766	piCSL4723	this study
73117588	pEPOR2KN0016	piCHS4011	pEPOR1CB0008	pEPOR1CB021	none	piCH41766	piCSL4723	this study
74117589	pEPOR2KN0017	piCHS4011	pEPOR1CB0009	pEPOR1CB0114	none	piCH41766	piCSL4723	this study
75117590	pEPOR2KN0018	piCHS4011	pEPOR1CB0009	pEPOR1CB0118	none	piCH41766	piCSL4723	this study
76117591	pEPOR2KN0019	piCHS4011	pEPOR1CB0009	pEPOR1CB0119	none	piCH41766	piCSL4723	this study
77117592	pEPOR2KN0020	piCHS4011	pEPOR1CB0009	pEPOR1CB020	none	piCH41766	piCSL4723	this study
78117593	pEPOR2KN0021	piCHS4011	pEPOR1CB0009	pEPOR1CB021	none	piCH41766	piCSL4723	this study
79117594	pEPOR2KN0022	piCHS4011	pEPOR1CB0010	pEPOR1CB0114	none	piCH41766	piCSL4723	this study
80117595	pEPOR2KN0023	piCHS4011	pEPOR1CB0010	pEPOR1CB0118	none	piCH41766	piCSL4723	this study
81117596	pEPOR2KN0024	piCHS4011	pEPOR1CB0010	pEPOR1CB0119	none	piCH41766	piCSL4723	this

90	117605	pEPORZKN0038	pICH54011	pEPORICB0013	pEPORICB0029	none	pICH41766	pICSL4723	this study
91	117606	pEPORZKN0039	pICH54011	pEPORICB0014	pEPORICB0028	none	pICH41766	pICSL4723	this study
92	117607	pEPORZKN0040	pICH54011	pEPORICB0015	pEPORICB0058	none	pICH41766	pICSL4723	this study
93	117608	pEPORZKN0041	pICH54011	pICSL11023	pEPORICB0071	none	pICH41766	pICSL4723	this study
94	117609	pEPORZKN0042	pICH54011	pEPORICB0010	pEPORICB0071	none	pICH41766	pICSL4723	this study
95	117610	pEPORZKN0043	pICH54011	pEPORICB0011	pEPORICB0071	none	pICH41766	pICSL4723	this study
96	117611	pEPORZKN0044	pICH54011	pEPORICB0112	pEPORICB0075	none	pICH41766	pICSL4723	this study
97	117612	pEPORZKN0045	pICH54011	pICSL11023	pEPORICB0075	none	pICH41766	pICSL4723	this study
98	117613	pEPORZKN0046	pICH54011	pEPORICB0010	pEPORICB0075	none	pICH41766	pICSL4723	this study
99	117614	pEPORZKN0047	pICH54011	pEPORICB0011	pEPORICB0075	none	pICH41766	pICSL4723	this study
100	117615	pEPORZKN0048	pICH54011	pEPORICB0112	pEPORICB0075	none	pICH41766	pICSL4723	this study
101	117616	pEPORZKN0049	pICH54011	pICSL11023	pEPORICB0081	none	pICH41766	pICSL4723	this study
102	117617	pEPORZKN0050	pICH54011	pEPORICB0010	pEPORICB0081	none	pICH41766	pICSL4723	this study
103	117618	pEPORZKN0051	pICH54011	pEPORICB0011	pEPORICB0081	none	pICH41766	pICSL4723	this study
104	117619	pEPORZKN0052	pICH54011	pEPORICB0112	pEPORICB0081	none	pICH41766	pICSL4723	this study
105	117620	pEPORZKN0053	pICH54011	pICSL11023	pEPORICB0083	none	pICH41766	pICSL4723	this study
106	117621	pEPORZKN0054	pICH54011	pEPORICB0010	pEPORICB0083	none	pICH41766	pICSL4723	this study
107	117622	pEPORZKN0055	pICH54011	pEPORICB0011	pEPORICB0083	none	pICH41766	pICSL4723	this study
108	117623	pEPORZKN0056	pICH54011	pEPORICB0112	pEPORICB0083	none	pICH41766	pICSL4723	this study
109	117624	pEPORZKN0057	pICH54011	pICSL11023	pEPORICB0084	none	pICH41766	pICSL4723	this study
110	117625	pEPORZKN0058	pICH54011	pEPORICB0010	pEPORICB0084	none	pICH41766	pICSL4723	this study
111	117626	pEPORZKN0059	pICH54011	pEPORICB0011	pEPORICB0084	none	pICH41766	pICSL4723	this study
112	117627	pEPORZKN0060	pICH54011	pEPORICB0112	pEPORICB0084	none	pICH41766	pICSL4723	this study
113	117628	pEPORZKN0061	pICH54011	pEPORICB0015	pEPORICB0087	none	pICH41766	pICSL4723	this study
114	117629	pEPORZKN0062	pICH54011	pEPORICB0113	pEPORICB0087	none	pICH41766	pICSL4723	this study
115	117630	pEPORZKN0063	pICH54011	pICSL11023	pEPORICB0089	none	pICH41766	pICSL4723	this study
116	117631	pEPORZKN0064	pICH54011	pEPORICB0010	pEPORICB0089	none	pICH41766	pICSL4723	this study
117	117632	pEPORZKN0065	pICH54011	pEPORICB0011	pEPORICB0089	none	pICH41766	pICSL4723	this study
118	117633	pEPORZKN0066	pICH54011	pEPORICB0112	pEPORICB0089	none	pICH41766	pICSL4723	this study
119	117634	pEPORZKN0067	pICH54011	pICSL11023	pEPORICB0092	pEPORICB0103	pICH41780	pICSL4723	this study
120	117635	pEPORZKN0068	pICH54011	pEPORICB0010	pEPORICB0092	pEPORICB0103	pICH41780	pICSL4723	this study
121	117636	pEPORZKN0069	pICH54011	pEPORICB0011	pEPORICB0092	pEPORICB0103	pICH41780	pICSL4723	this study
122	117637	pEPORZKN0070	pICH54011	pEPORICB0112	pEPORICB0092	pEPORICB0103	pICH41780	pICSL4723	this study
123	117638	pEPORZKN0071	pICH54011	pICSL11023	pEPORICB0093	pEPORICB0104	pICH41780	pICSL4723	this study
124	117639	pEPORZKN0072	pICH54011	pEPORICB0010	pEPORICB0093	pEPORICB0104	pICH41780	pICSL4723	this study
125	117640	pEPORZKN0073	pICH54011	pEPORICB0011	pEPORICB0093	pEPORICB0104	pICH41780	pICSL4723	this study
126	117641	pEPORZKN0074	pICH54011	pEPORICB0112	pEPORICB0093	pEPORICB0104	pICH41780	pICSL4723	this study
127	117642	pEPORZKN0075	pICH54011	pEPORICB0015	pEPORICB0098	pEPORICB0109	pICH41780	pICSL4723	this study
128	117643	pEPORZKN0076	pICH54011	pEPORICB0113	pEPORICB0098	pEPORICB0109	pICH41780	pICSL4723	this study
129	117644	pEPORZKN0077	pICH54011	pEPORICB0015	pEPORICB0099	pEPORICB0110	pICH41780	pICSL4723	this study
130	117645	pEPORZKN0078	pICH54011	pEPORICB0113	pEPORICB0099	pEPORICB0110	pICH41780	pICSL4723	this study
131	117646	pEPORZKN0079	pICH54011	pEPORICB0015	pEPORICB0100	pEPORICB0111	pICH41780	pICSL4723	this study
132	117647	pEPORZKN0080	pICH54011	pEPORICB0113	pEPORICB0100	pEPORICB0111	pICH41780	pICSL4723	this study

note:
pICH54011 = AddGene #48065

note:
pICH41766 = AddGene #48018
pICH41780 = AddGene #48019