

GGA Method

with pClone Red, rClone Red,
actClone Red, or repClone Red

by

A. Malcolm Campbell and Todd Eckdahl

Eco RI

GAATTC

CTTAAG

palindrome

type II

Eco RI

GAATTC

CTTAAG

palindrome

type II

Eco RI



type II

Eco RI

G

AATTC

CTTAA

G

type II

Bsa I

GAGACC

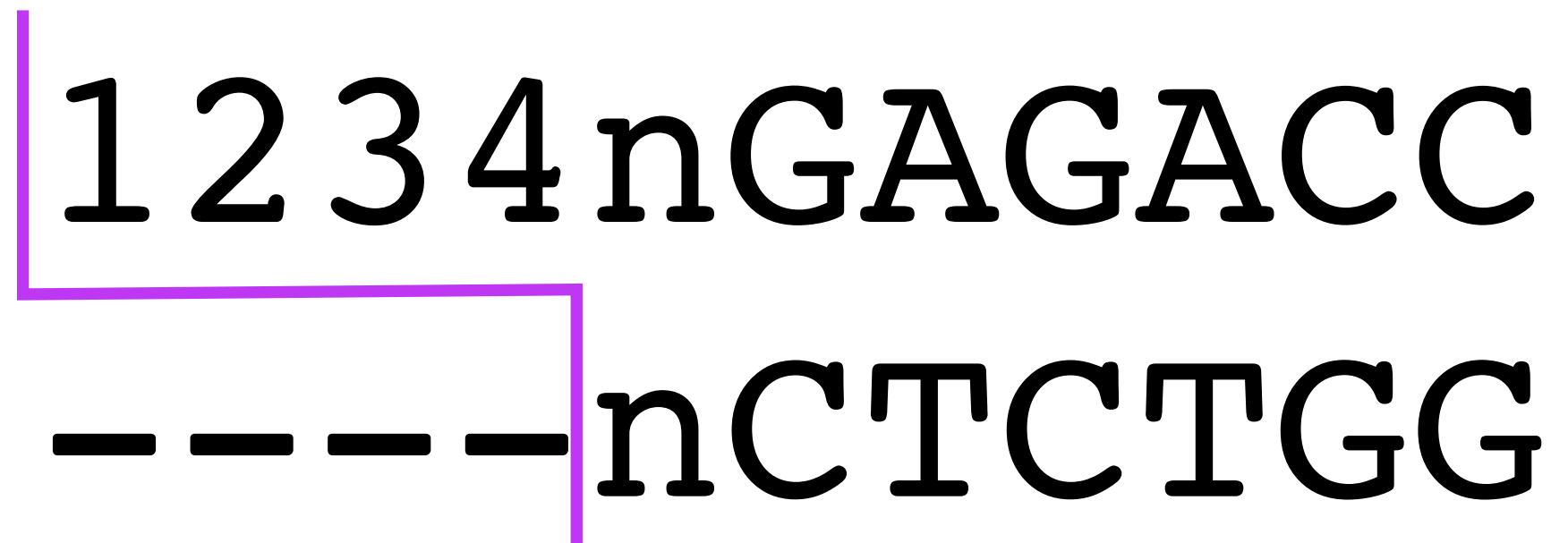
CTCTGG

not a
palindrome

type II

Bsa I

1 2 3 4 n G A G A C C
- - - - n C T C T G G



type II

Bsa I

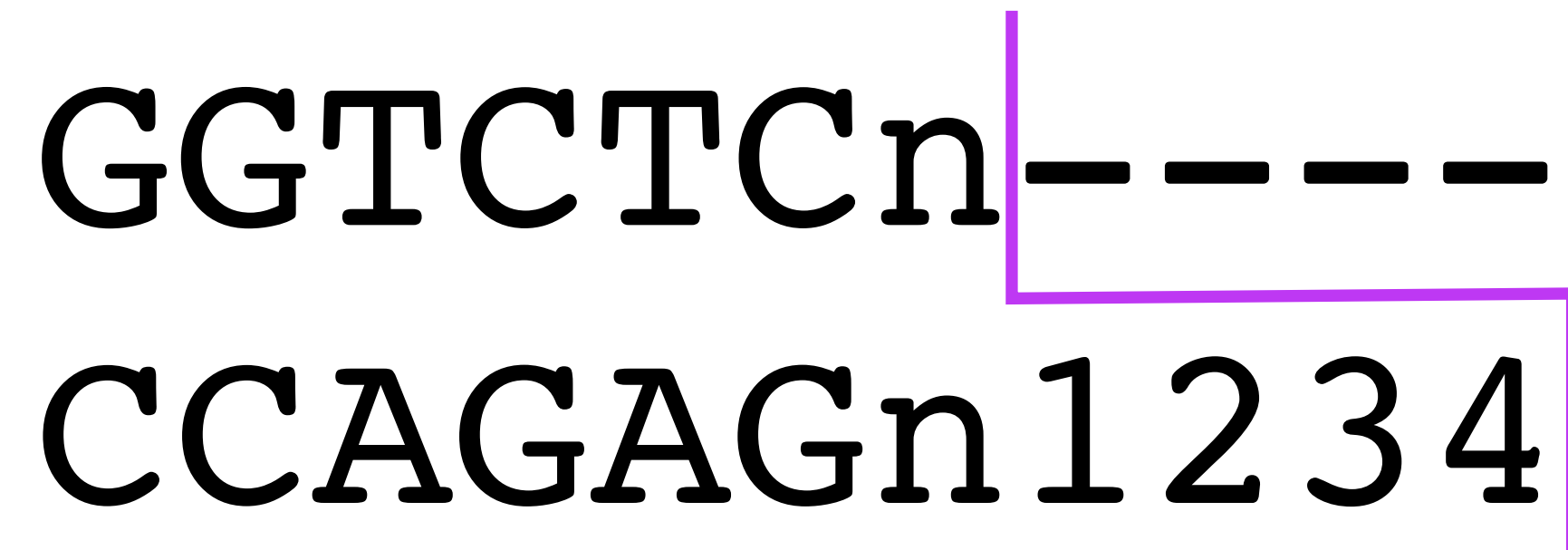
1 2 3 4 n G A G A C C
n C T C T G G

— — — —

type II

Bsa I

GGTCTCn-----
CCAGAGn1234

A diagram showing the recognition sequence for the Bsa I restriction enzyme. The top strand is 5'-GGTCTCn-----3' and the bottom strand is 3'-CCAGAGn1234-5'. A purple L-shaped line indicates the cleavage site: a vertical line between the 'C' and 'n' on the top strand, and a horizontal line between the 'n' and '1' on the bottom strand.

type II

Bsa I

GGTCTCn

CCAGAGn 1 2 3 4

type II

Bsa I

cuts
left

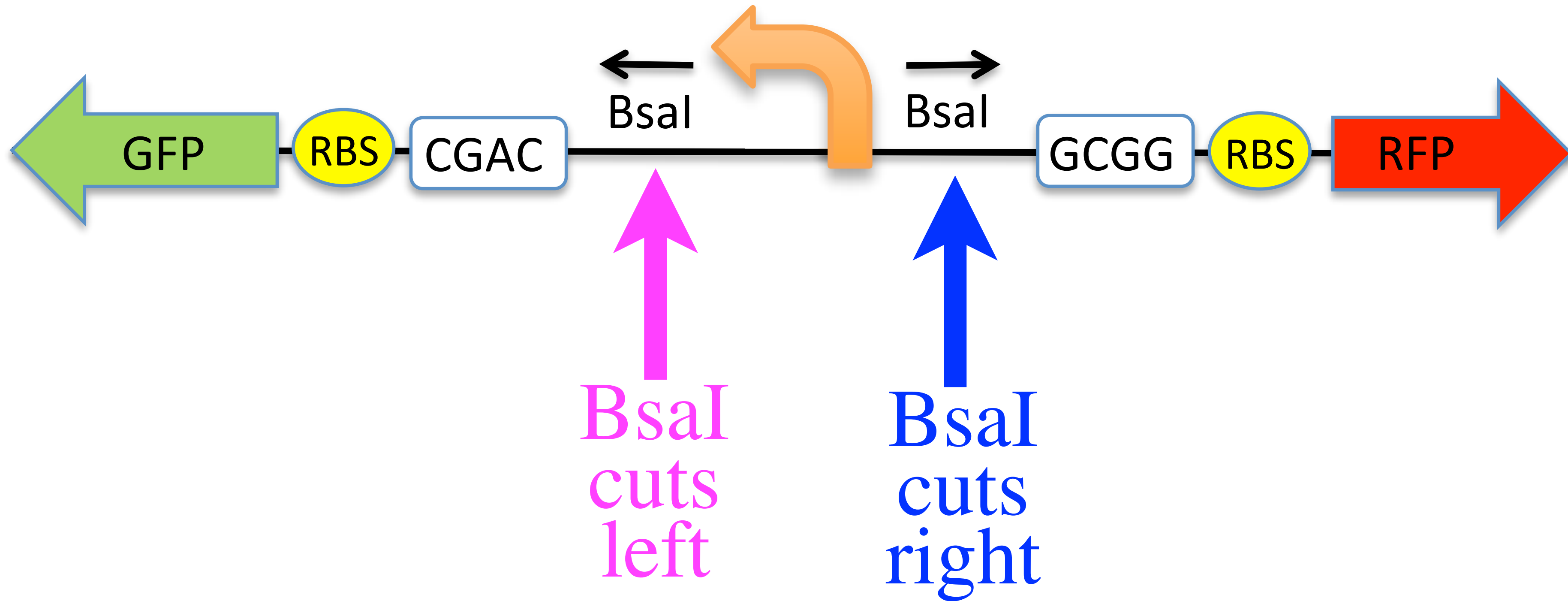
1 2 3 4 n GAGACC
-----n CTCTGG

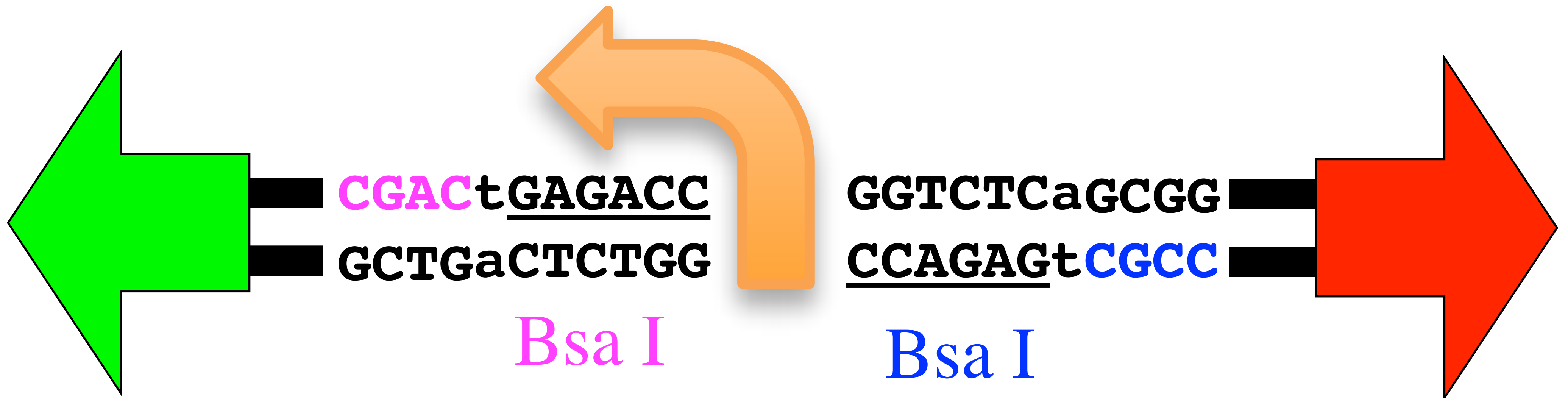
GGTCTCn-----

CCAGAGn 1 2 3 4

cuts
right

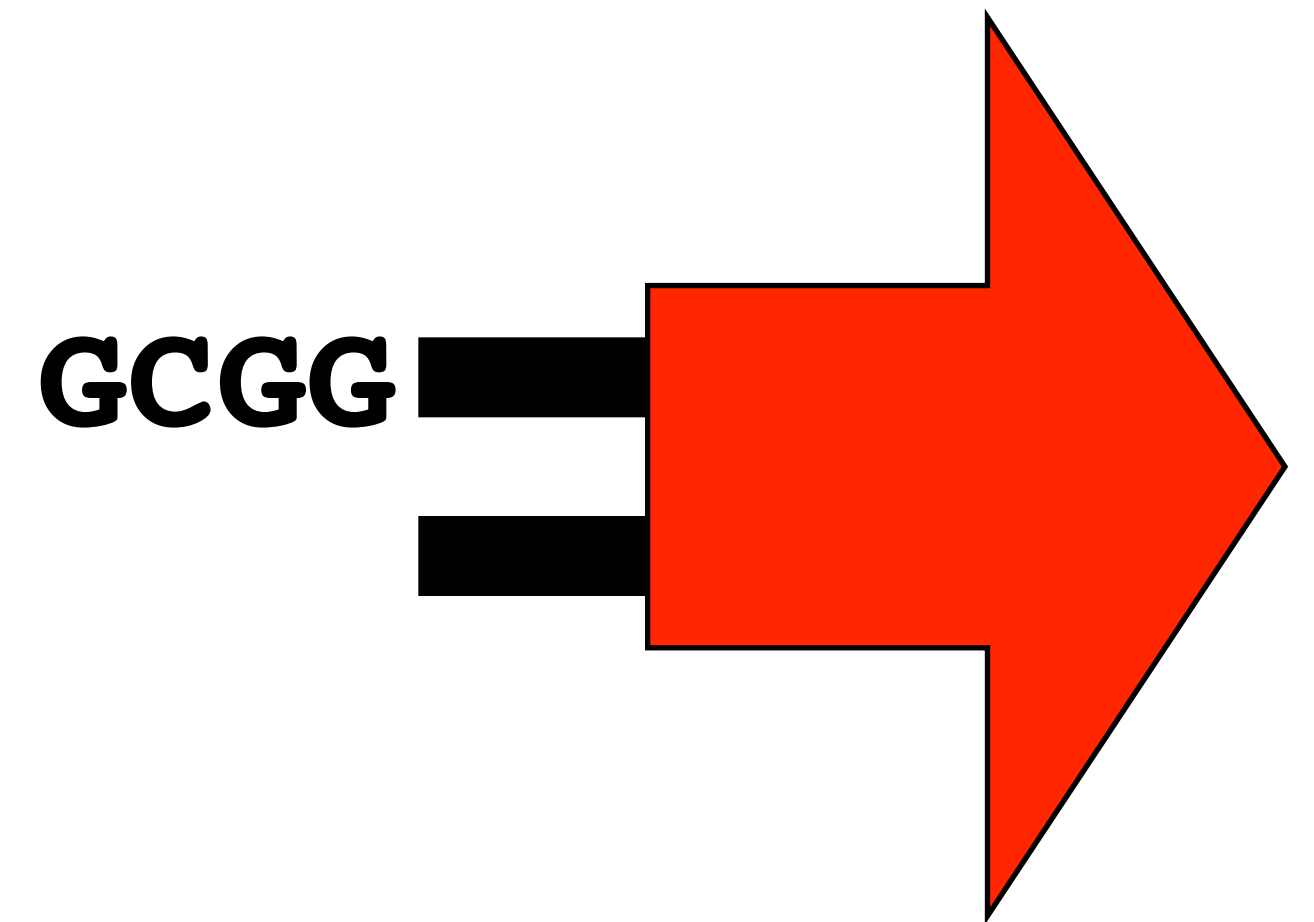
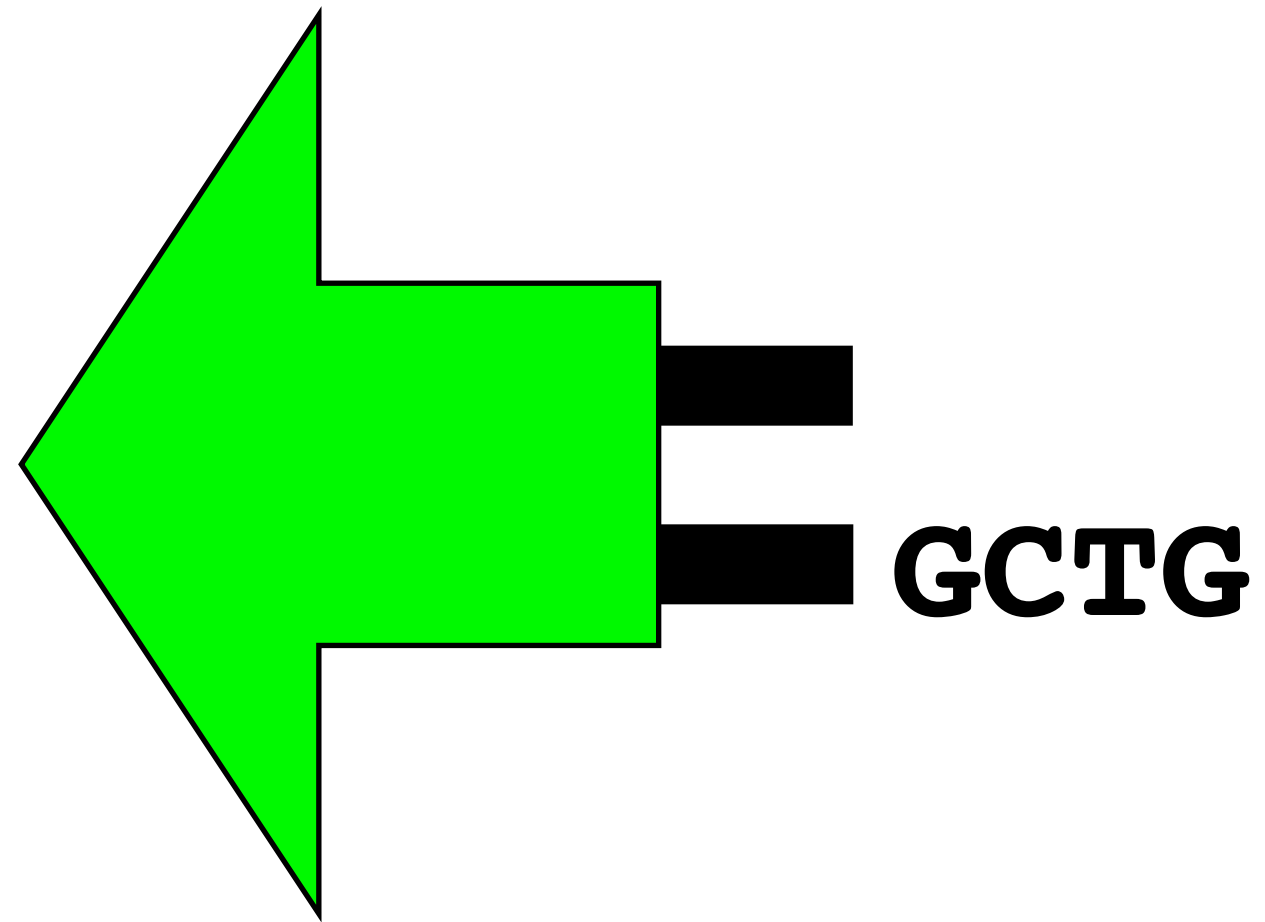
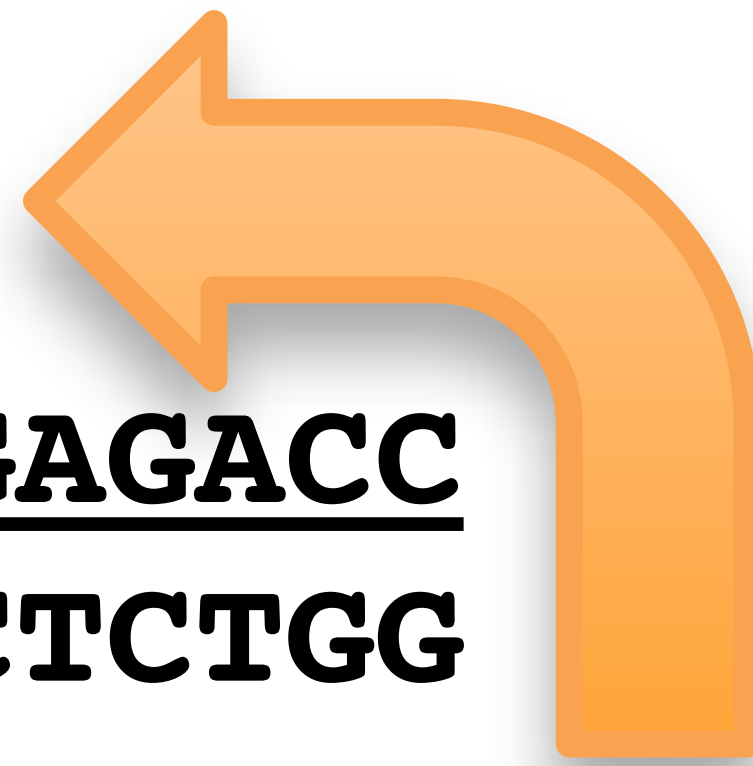
Part J119137

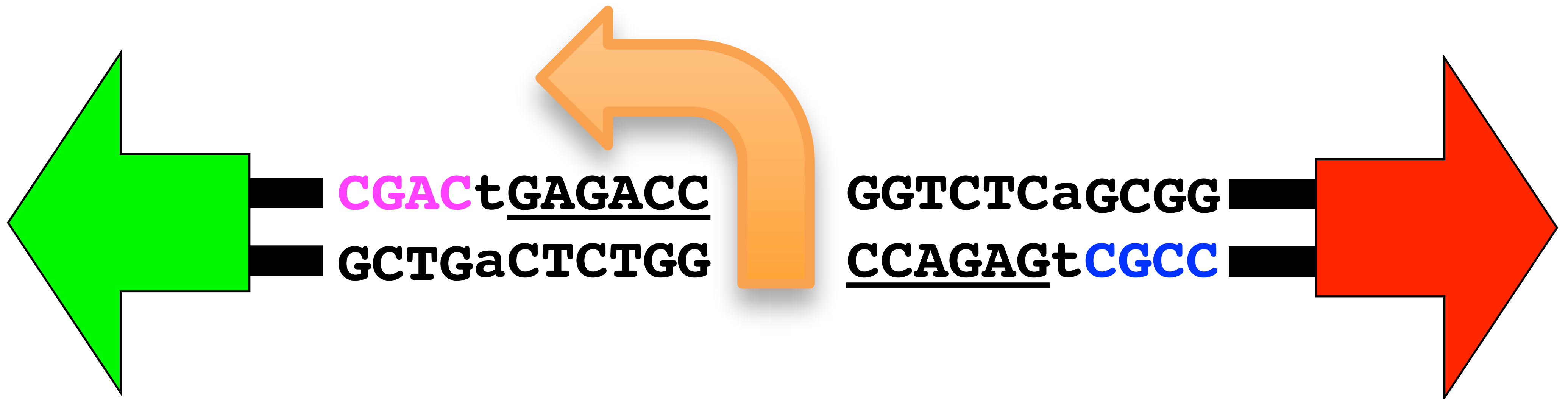




CGAC t **GAGACC**
aCTCTGG

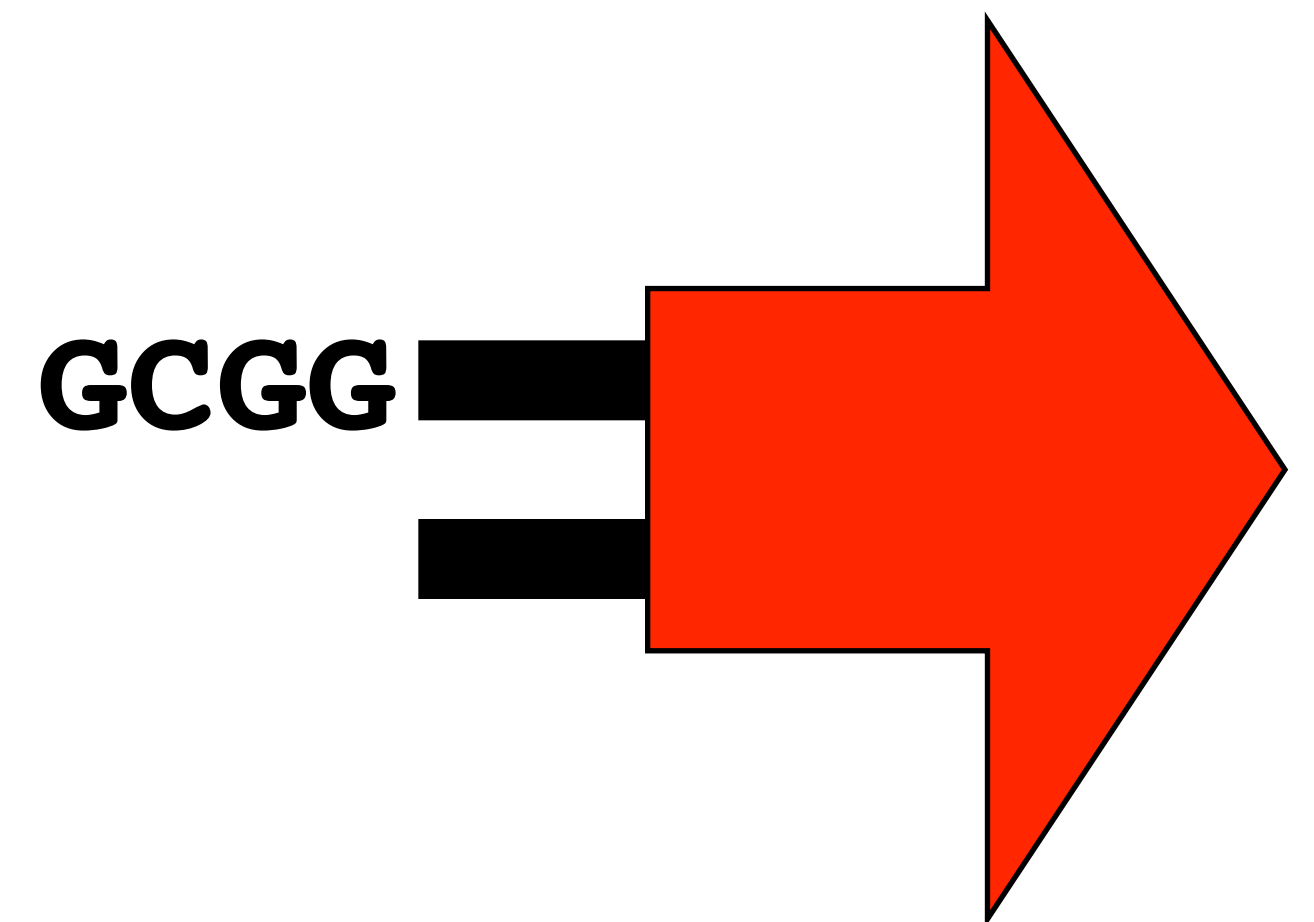
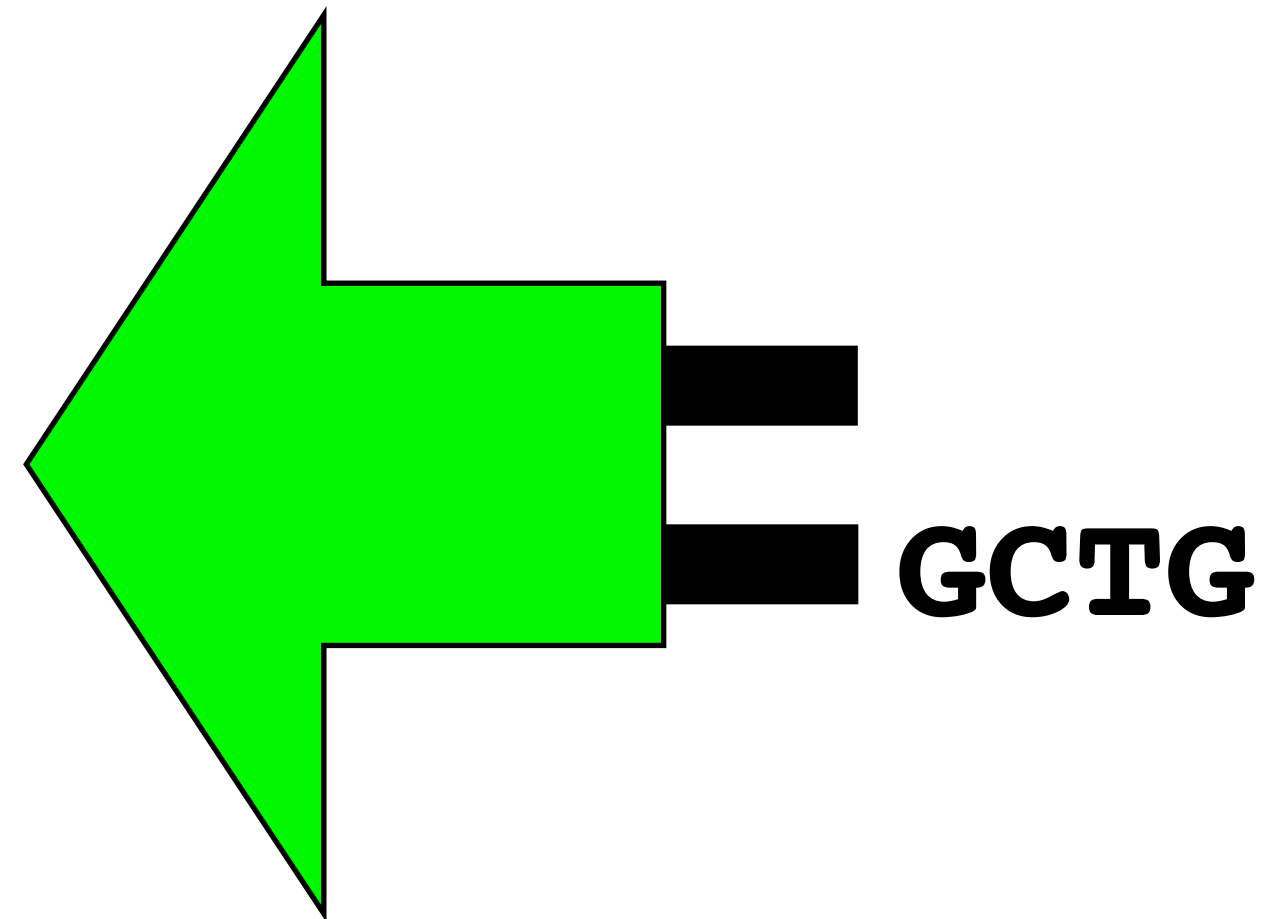
GGTCTCa
CCAGAGt **CGCC**





CGAC **t** **GAGACC**
aCTCTGG

GGTCTCa
CCAGAGt **CGCC**

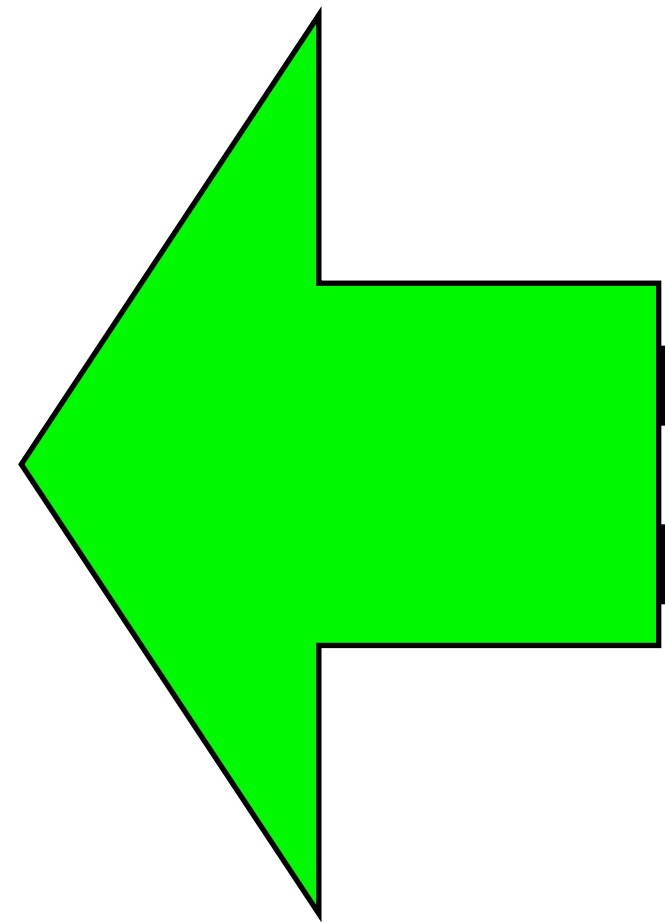


CGAC (promoter)
(promoter) **CGCC**

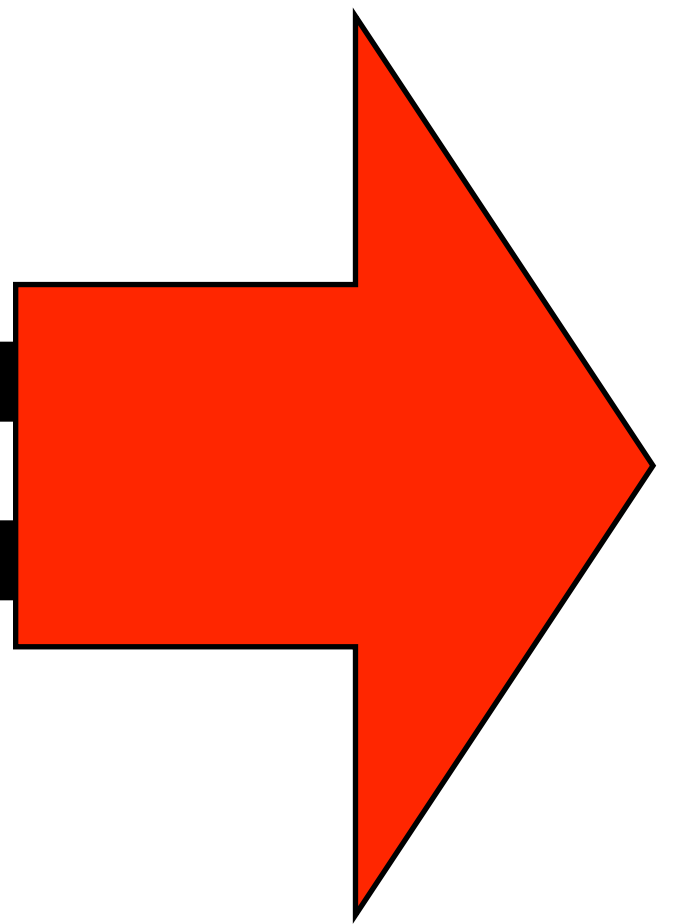
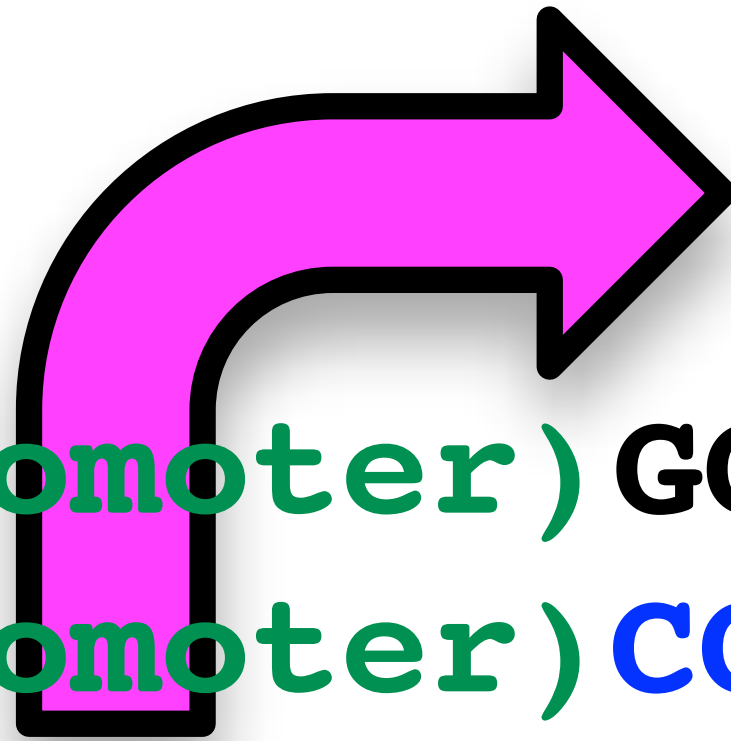
CGAC t GAGACC
aCTCTGG



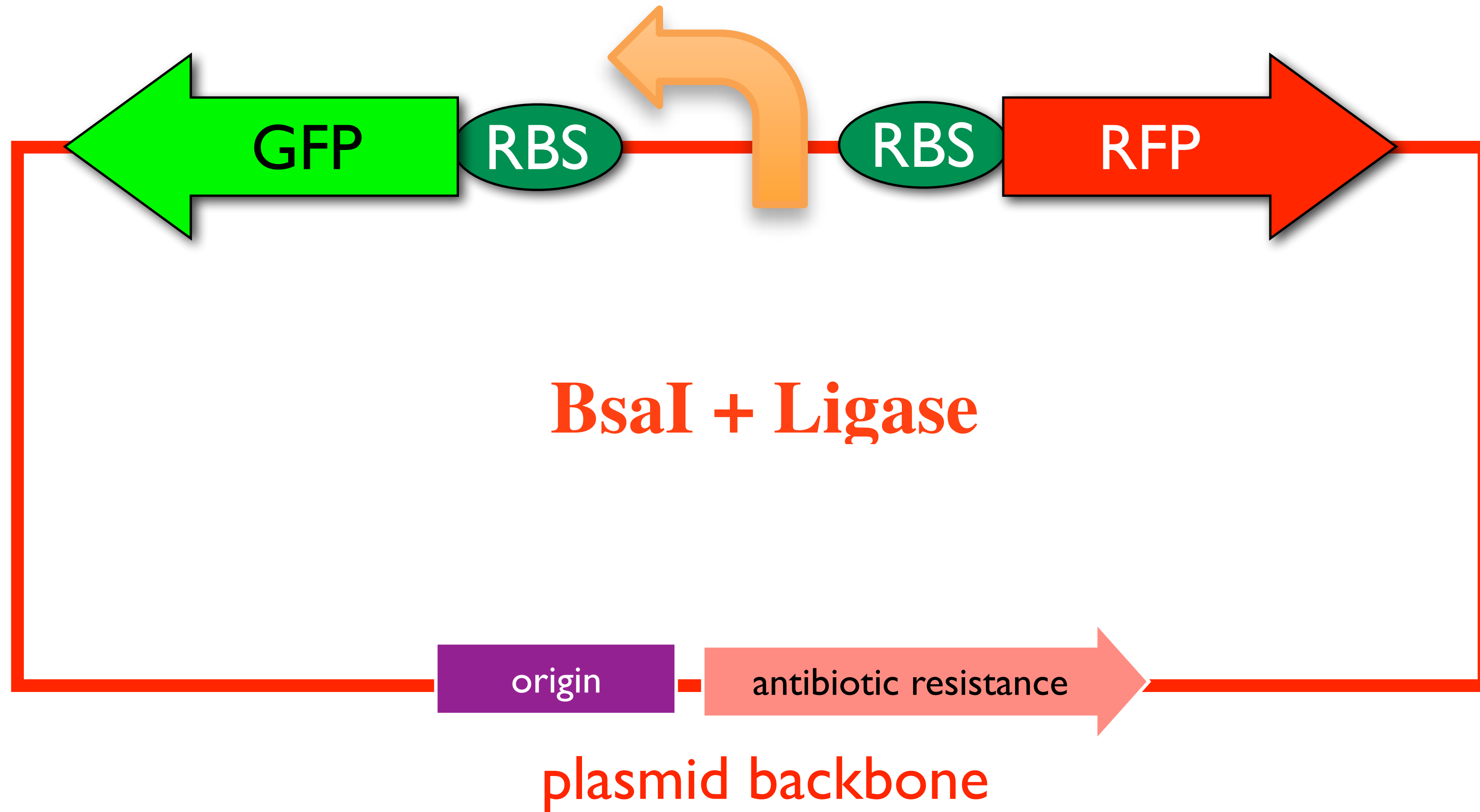
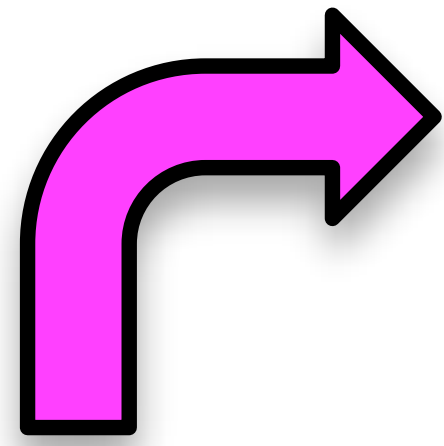
GGTCTCa
CCAGAG tCGCC



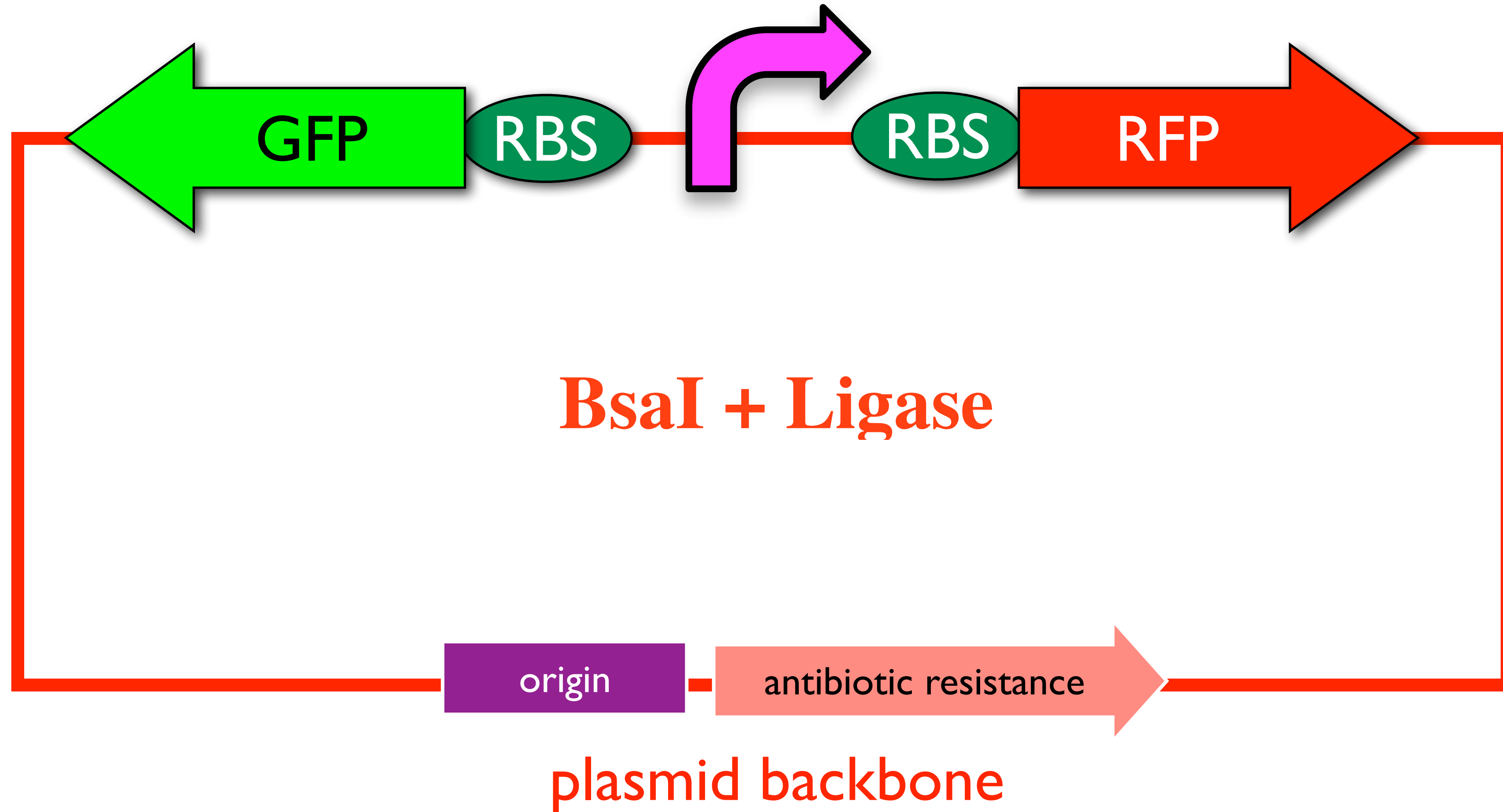
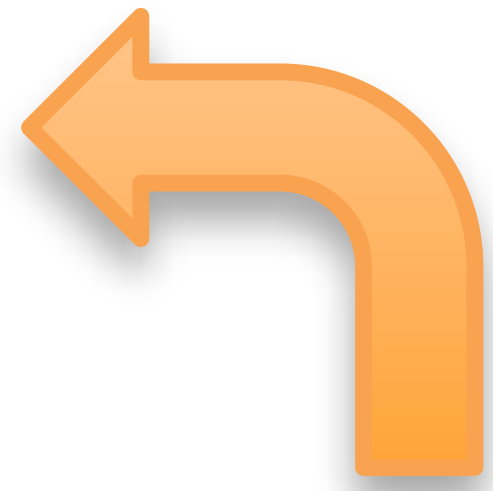
CGAC (promoter) GCGG
GCTG (promoter) CGCC



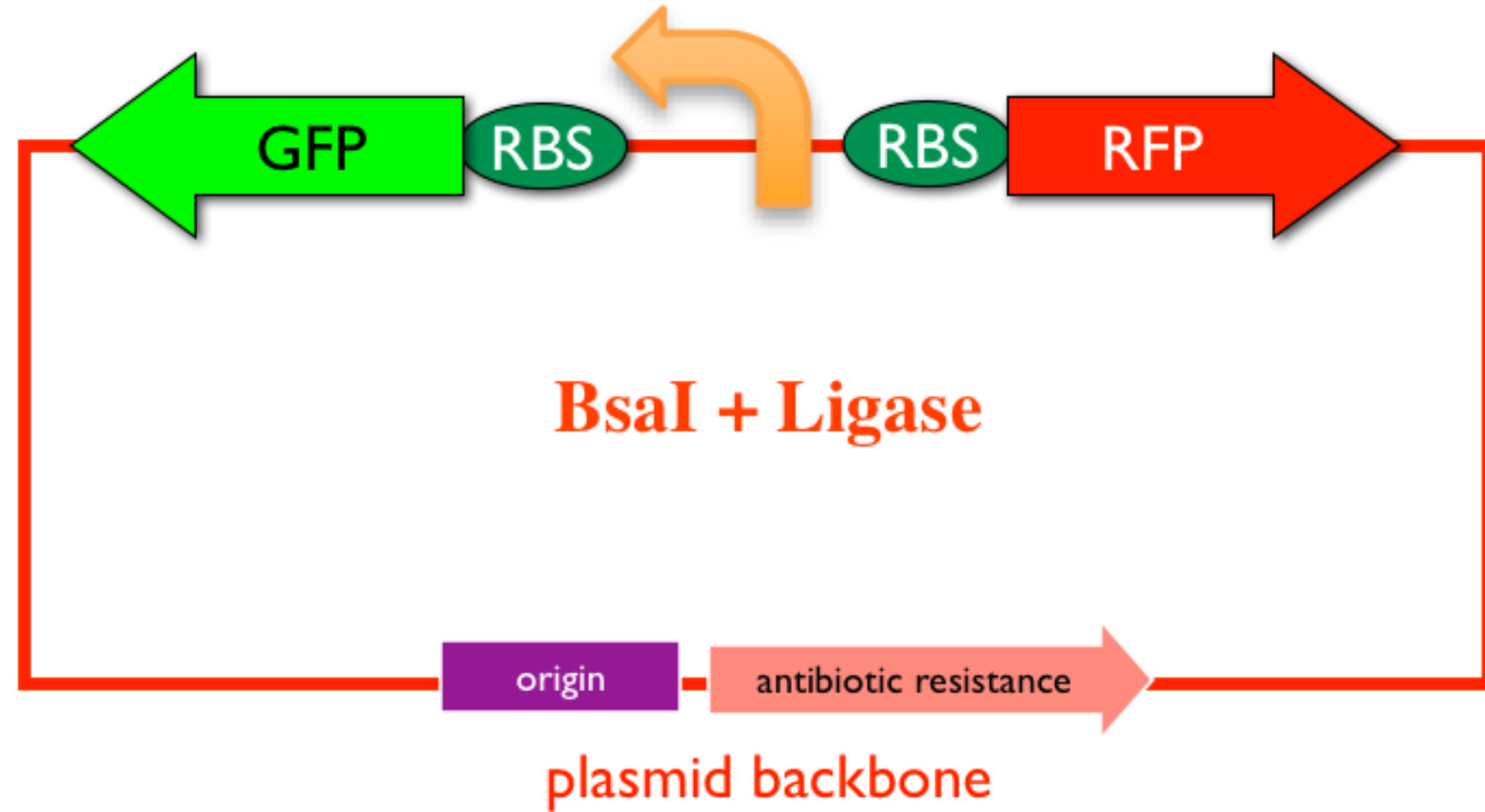
GGA Ligation Method



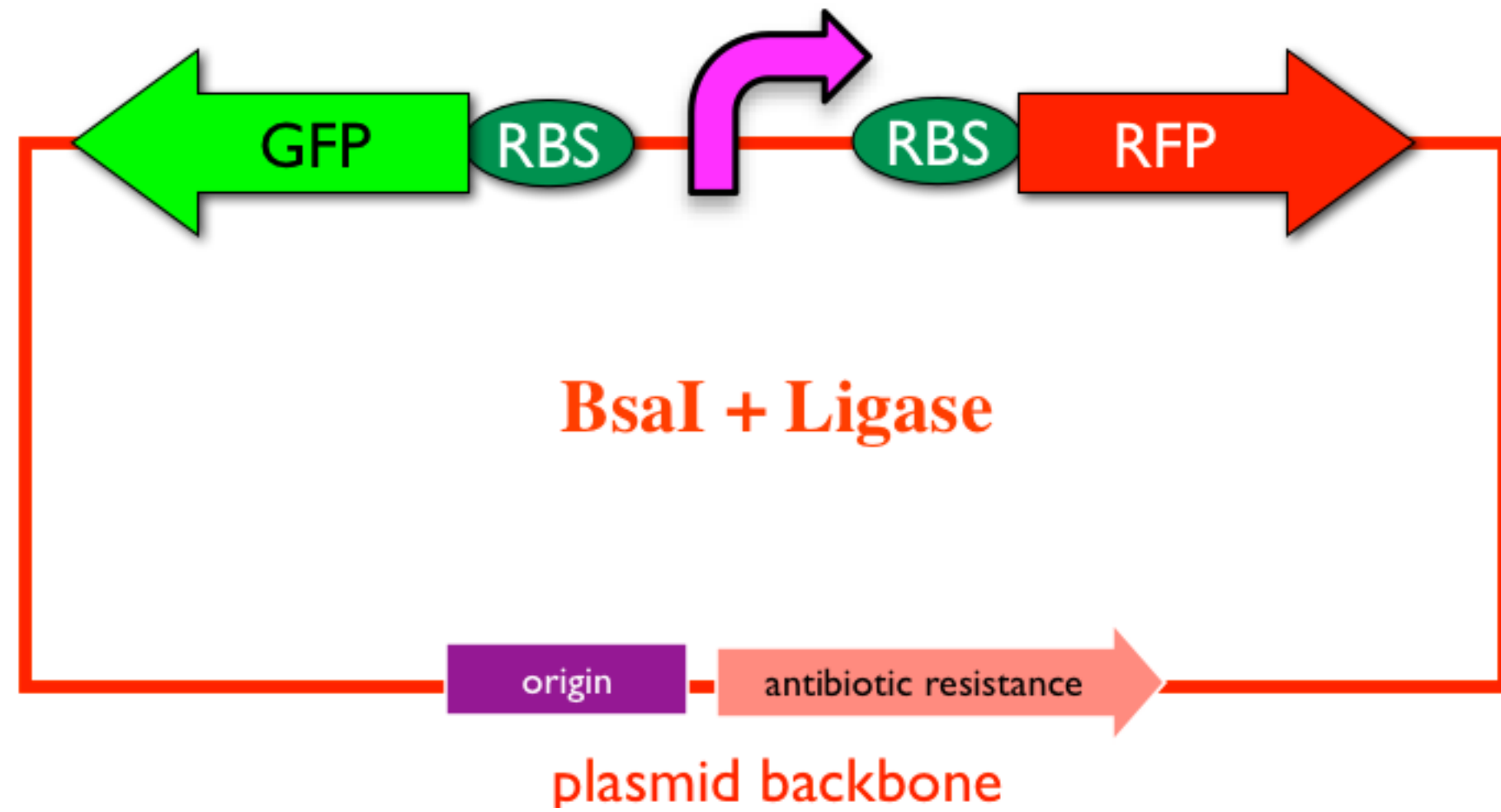
GGA Ligation Method



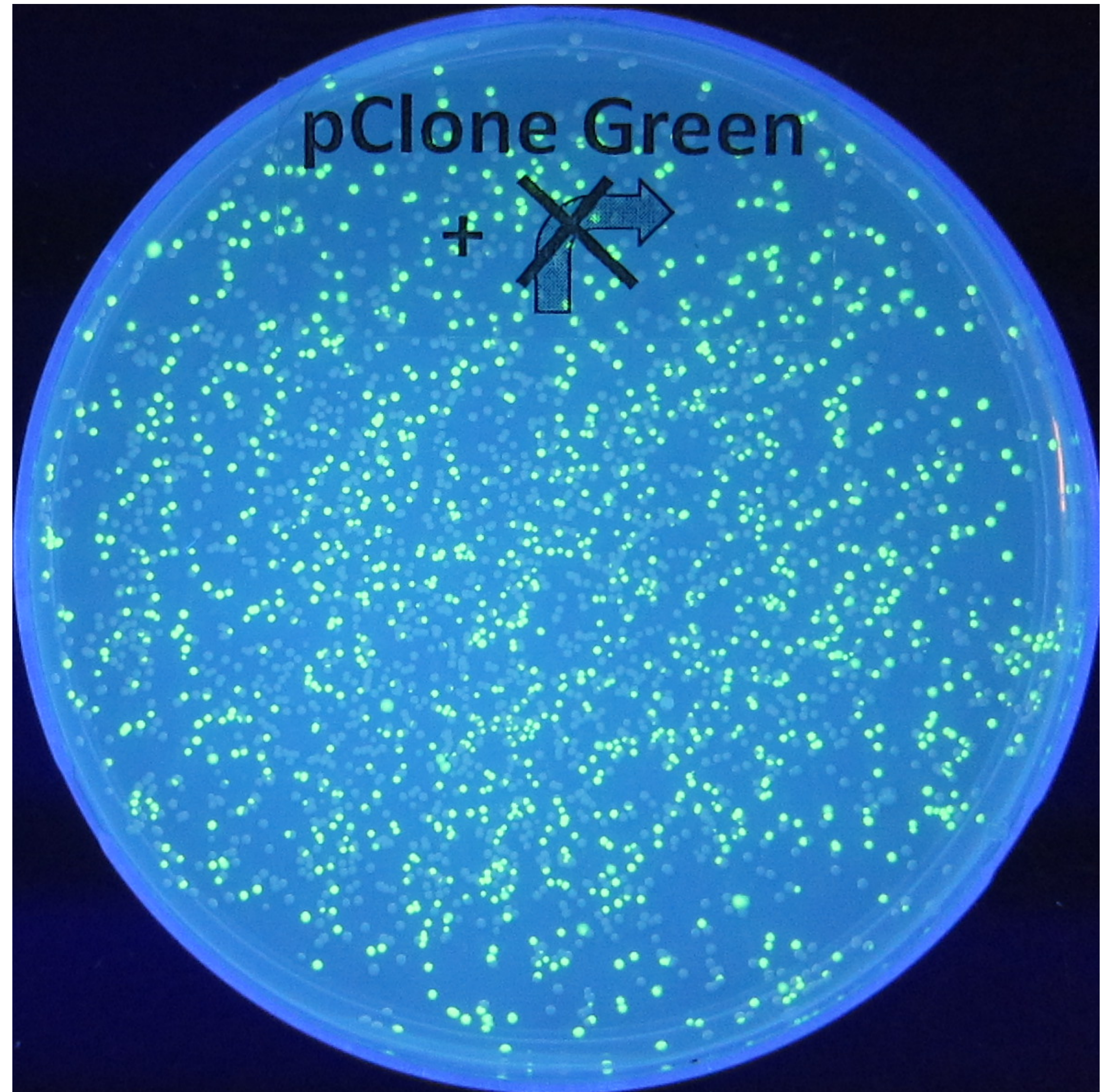
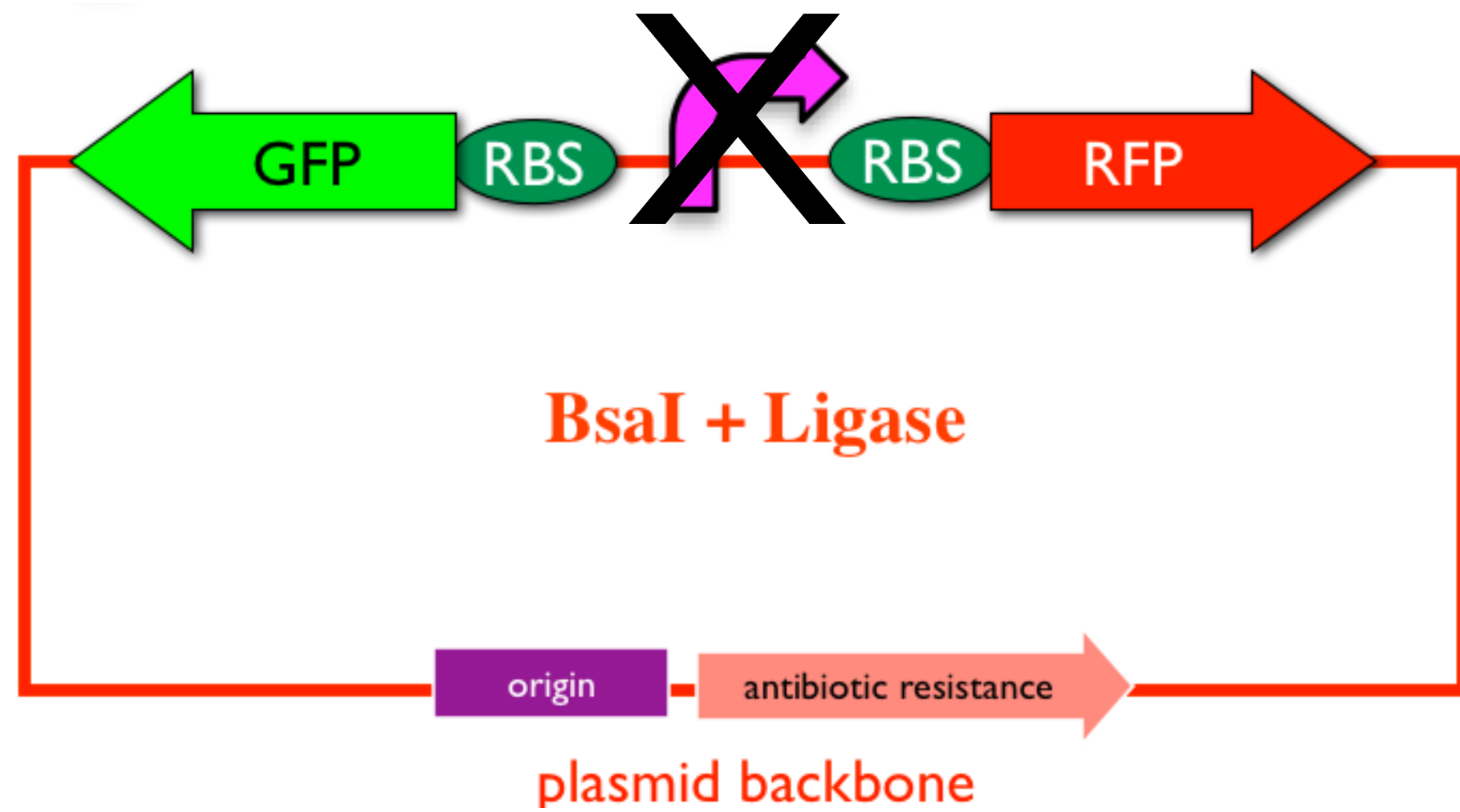
GGA Ligation Method



GGA Ligation Method



GGA Ligation Method



Registry of Functional Control Elements



Registry of Standard Biological Parts [Go](#) [Search](#)

non-wiki [Malcolm Campbell](#) [My account](#) [My requests](#) [Log out](#)

Campbell M Lab Parts

Favorite Campbell M Lab Parts [Edit](#)

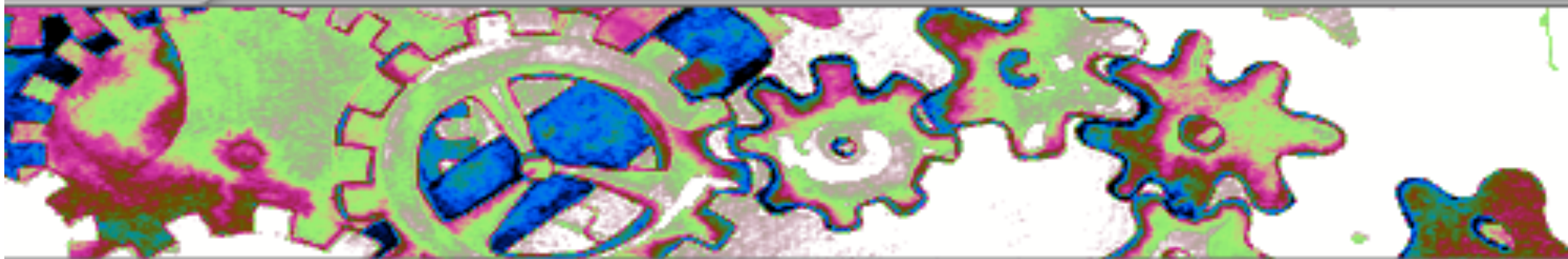
-?-	Name	Type	Description	Designer	Length
-----	------	------	-------------	----------	--------

Campbell M Lab Parts Sandbox [Edit](#)

-?-	Name	Type	Description	Designer	Length
	BBa_J100000	Coding	Cre with 8bp restriction sites and 1-Clause 2-SAT Problem Inserted	Eric Sawyer	1069
	BBa_J100001	Composite	pTet+RBS+Cre2SAT1Clause+pLpp+tRNA CCACU	Eric Sawyer	1357
	BBa_J100002	Composite	pTet+RBS+Cre2SAT1Clause+pLpp+tRNA CGGUC	Eric Sawyer	1357
	BBa_J100003	Generator	pTet+RBS+Cre2SAT1Clause	Eric Sawyer	1149
	BBa_J100004	Reporter	pTet+LoxP+RBS+RFP+LoxP	Eric Sawyer	870
	BBa_J100005	Other	Palindromic Stop Sequence	Eric Sawyer	221
	BBa_J100006	Intermediate	LoxP+Stop Sequence+LoxP	Eric Sawyer	305
	BBa_J100007	Intermediate	pLac+RBS+LoxP+Stop Sequence+LoxP	Eric Sawyer	533
	BBa_J100008	Composite	pLpp-tRNA CCACU-pLpp-tRNA CUAGU	Eric Sawyer	408
	BBa_J100009	Composite	pLpp-tRNA CCACU-pLpp-tRNA CGGUC	Eric Sawyer	408
	BBa_J100010	Composite	pLpp-tRNA CUAGU-pLpp-tRNA CGGUC	Eric Sawyer	408
	BBa_J100011	Composite	pLpp-tRNA CCACU-pLpp-tRNA CUAGU-pLpp-tRNA CGGUC	Eric Sawyer	616
	BBa_J100012	Intermediate	RBS-RFP-RBS	Eric Sawyer	747
	BBa_J100013	Coding	LuxI with 1 Clause 2-SAT Problem	Eric Sawyer	638
	BBa_J100014	Coding	LuxI with 2 Clause 2-SAT Problem	Eric Sawyer	652
	BBa_J100015	Composite	1 Clause 2-SAT Problem with Frameshifted LuxI and a GFP Reporter	Eric Sawyer	2757
	BBa_J100016	Composite	2 Clause 2-SAT Problem with Frameshifted LuxI and a GFP Reporter	Eric Sawyer	2771
	BBa_J100017	Composite	TT+pLux+RBS+LuxI(2-SAT 2 clause)+RBS+GFP+pLac+RBS+LuxR+tRNAs	Eric Sawyer	3395
	BBa_J100018	Protein_Domain	First Half of AspC gene	Catherine Doyle	448
	BBa_J100019	Protein_Domain	First half of ilvE gene	Julia Fearington	457
	BBa_J100020	Protein_Domain	Second Half of AspC	Catherine Doyle	869
	BBa_J100021	Protein_Domain	First Half of PyrE	Catherine Doyle	488
	BBa_J100022	Protein_Domain	Second Half of PyrE	Catherine Doyle	280
	BBa_J100025	Protein_Domain	First half of CAT gene	James Harden	434
	BBa_J100026	Protein_Domain	second half ilvE gene	Julia Fearington	574
	BBa_J100027	Protein_Domain	second half of TyrB	James Harden	288
	BBa_J100028	Other	placeholder insert for BsaI Golden Gate Assembly of promoter	Malcolm Campbell	877
	BBa_J100029	Regulatory	The promoter of rpoDPhs	Maggie Baay	76
	BBa_J100030	Regulatory	phoA is an inducible promoter induced by phosphate starvation.	Scott Hall	76
	BBa_J100031	Regulatory	Constitutive promoter C on Gene 1 of T7, transcribes RNA Pol.	Caroline Vrana	100
	BBa_J100032	Regulatory	proUP3 promoter	Molly Marshall	90
	BBa_J100033	Regulatory	dnakP1 promoter: Heat shock inducible	Chris Peek	101
	BBa_J100034	Regulatory	groE promoter	Margaret Stebbins	44
	BBa_J100036	Regulatory	Promoter induced by DNA damage	Erich Baker	52
	BBa_J100039	Regulatory	GalP1 Promoter-Induced By Galactose	Anaiah Toby	75
	BBa_J100040	Coding	LuxI with 3 clause 2-SAT problem	Eric Sawyer	684
	BBa_J100041	Composite	LuxI/GFP with 3 clause 2-SAT problem	Eric Sawyer	2803
	BBa_J100042	Coding	LuxI with 3 clause 3-SAT problem	Eric Sawyer	702
	BBa_J100043	Composite	LuxI/GFP with 3 clause 3-SAT problem	Eric Sawyer	2821
	BBa_J100044	Coding	LuxI with 4 clause 2-SAT problem	Eric Sawyer	704
	BBa_J100045	Composite	LuxI/GFP with 4 clause 2-SAT problem	Eric Sawyer	2823
	BBa_J100046	RNA	lpp+tRNA CCAUC (10 bp anticodon loop)	Eric Sawyer	201
	BBa_J100047	Protein_Domain	TyrB2	Julia Fearington	
	BBa_J100048	Protein_Domain	TyrB1	Julia Fearington	930
	BBa_K091231	Composite	LuxR producer and XOR gate	Malcolm Campbell	2772
	BBa_K091232	Composite	LuxR producer and RFP(rev) + RBS(rev) + pLux (for)	Malcolm Campbell	1916



Student Example



Registry of Standard Biological Parts

[Go](#) [Search](#)
[page](#) [discussion](#) [edit](#) [history](#) [move](#) [watch](#) [Mac Campbell](#) [My account](#) [My requests](#) [Log out](#)
[BBa J100033 Main Page](#) [Part Design](#) [Physical DNA](#) [Hard Information](#) [Experience](#) [Tools](#)

Part:BBa_J100033

Designed by Chris Peek Group: Campbell_M_Lab (2011-09-01)



Regulatory

DNA Planning

Experience:

[Get This Part](#)

dnakP1 promoter: Heat shock inducible

dnaKP1 is naturally off, but is induced when E. coli is heat shocked, resulting in transcription downstream from this promoter.

Sequence and Features

Format:	Subparts	Ruler	SS	DS	Search:	Length: 101 bp	Context: Part only	Get selected sequence		
1	11	21	31	41	51	61	71	81	91	
1	aaatttctgc	gcaaaagcac	aaaaaatttt	tgcattctccc	ccttgatgac	gtggtttacg	acccattta	gtagtcaacc	gcagtgagtg	agtctgcaaa
	tttaaagacg	cgttttcgtg	ttttttaaaa	acgtagaggg	ggaactactg	caccaaatgc	tggggtaaat	catcagttgg	cgtcactcac	tcagacgttt
101	a									
	t									

Assembly Compatibility:

[10](#) [12](#) [21](#) [23](#) [25](#)

Student Example

Registry of Standard Biological Parts [Go](#) [Search](#)

[page](#) [discussion](#) [edit](#) [history](#) [move](#) [watch](#) [Mac Campbell](#) [My account](#) [My requests](#) [Log out](#)

[BBa J100033 Main Page](#) [Part Design](#) [Physical DNA](#) [Hard Information](#) [Experience](#) [Tools](#)

Part:BBa_J100033:Experience

Designed by Chris Peek Group: Campbell_M_Lab (2011-09-01)

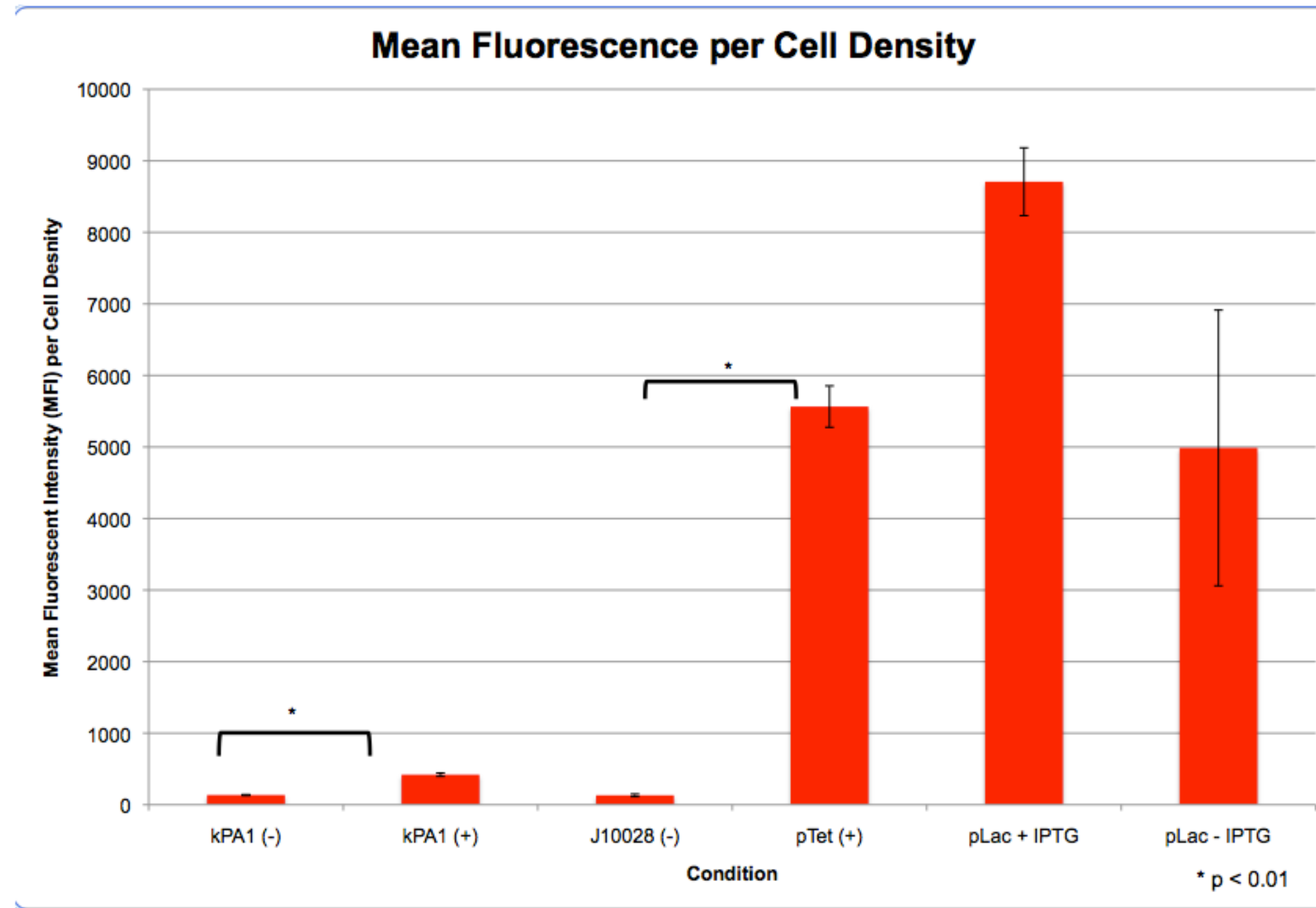


[DNA Planning](#)
[Experience:](#)
[Get This Part](#)

This experience page is provided so that any user may enter their experience using this part. Please enter how you used this part and how it worked out.

Applications of BBa_J100033

[\[edit\]](#)



cells containing dnaKP1 without heat shock (incubated at 37°C) B: Experimental: cells containing dnaKP1 with heat shock (incubated at 40°C) C: Negative control: part i100028 without pTet promoter D: Positive control: part i100028 with pTet promoter (always on) E: pLac promoter (part i715039) with inducer (IPTG) F: pLac

Bio113 Students

Doing Real DNA

Control Element Research