FIG. 1A

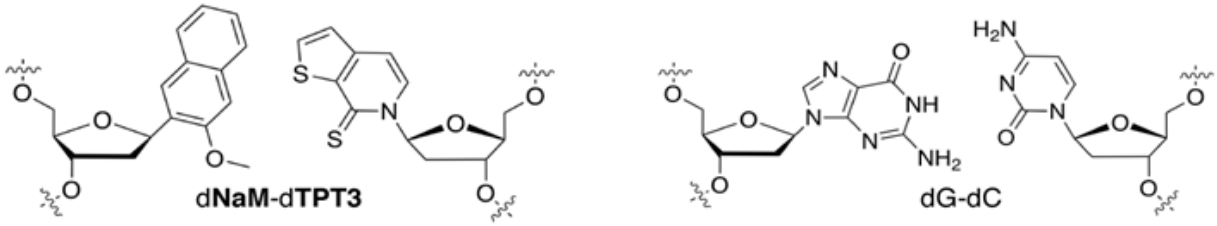

dNaM-dTPT3
dG-dC

FIG. 1B

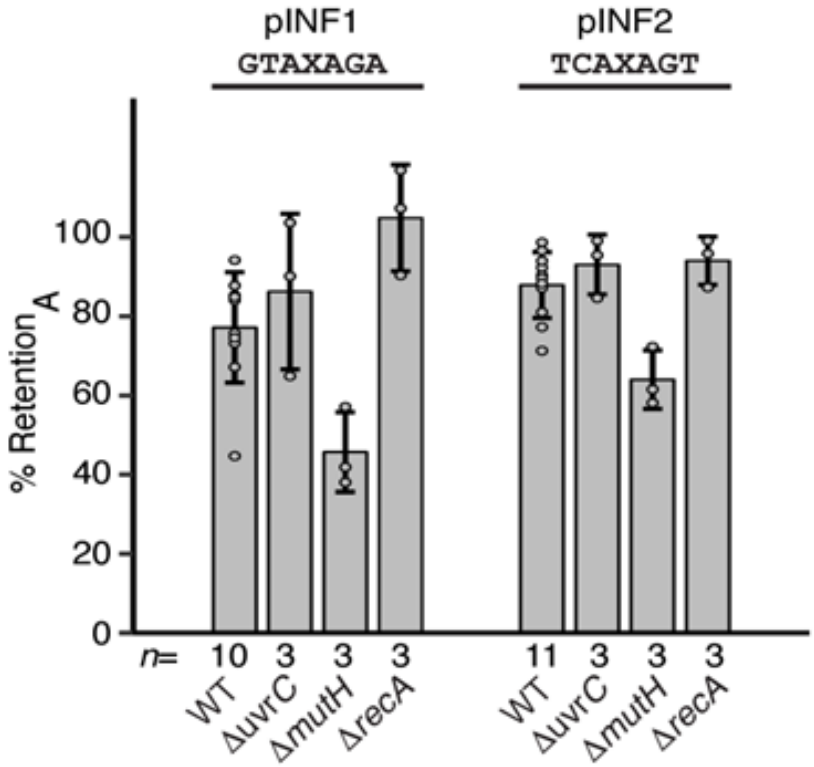

pINF1
GTAXAGA
pINF2
TCAXAGT
% Retention A
100
80
60
40
20
0
n=
10 3 3 3
11 3 3 3
WT
ΔuvrC
ΔmutH
ΔrecA

FIG. 1C

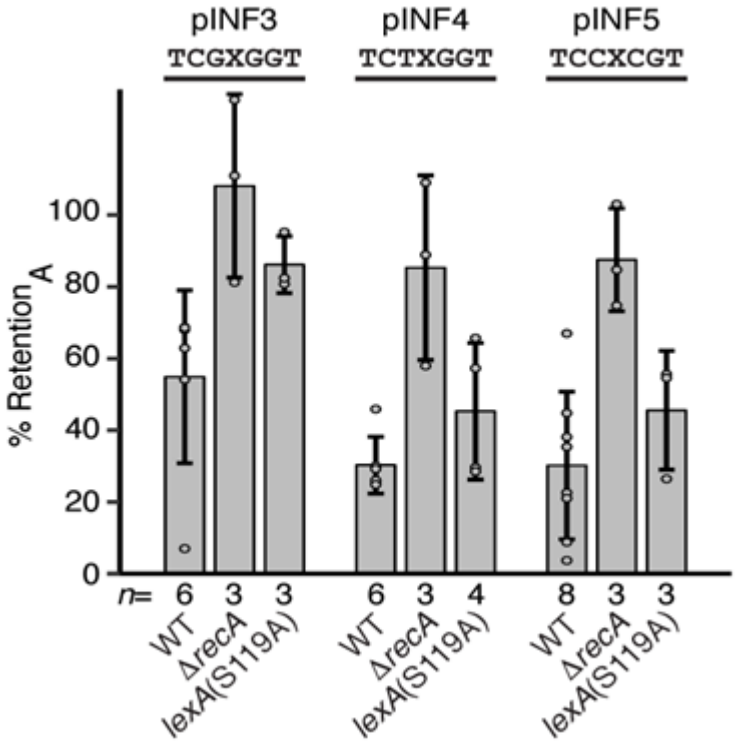

pINF3
TCGXGGT
pINF4
TCTXGGT
pINF5
TCCXCGT
% Retention A
100
80
60
40
20
0
n= 6 3 3 6 3 4 8 3 3
WT
ΔrecA
lexA(S119A)

FIG. 1D

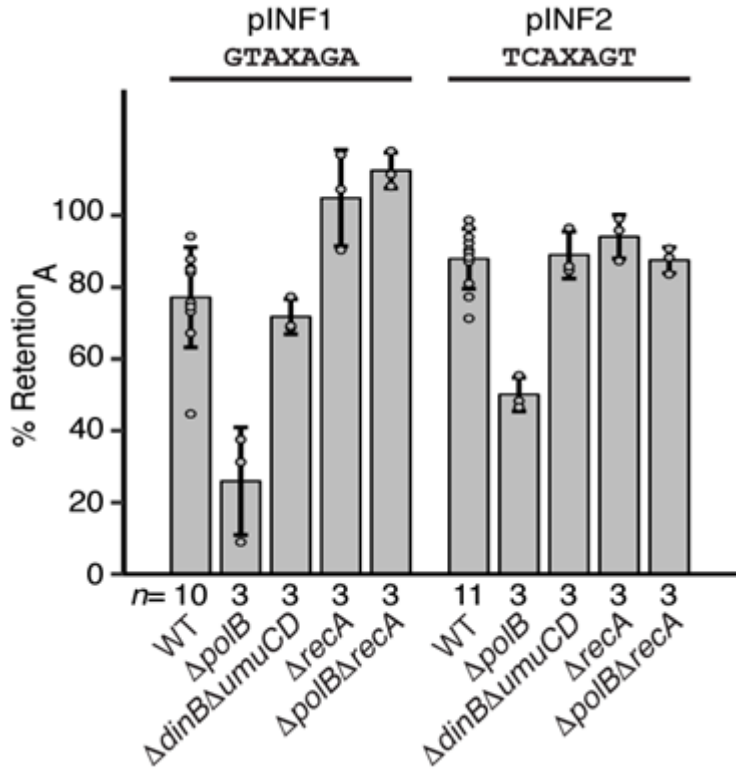

pINF1
GTAXAGA
pINF2
TCAXAGT
% Retention A
100
80
60
40
20
0
n= 10 3 3 3 3 11 3 3 3 3
WT
ΔpolB
ΔdinBΔumuCD
ΔrecA
ΔpolBΔrecA

FIG. 1E

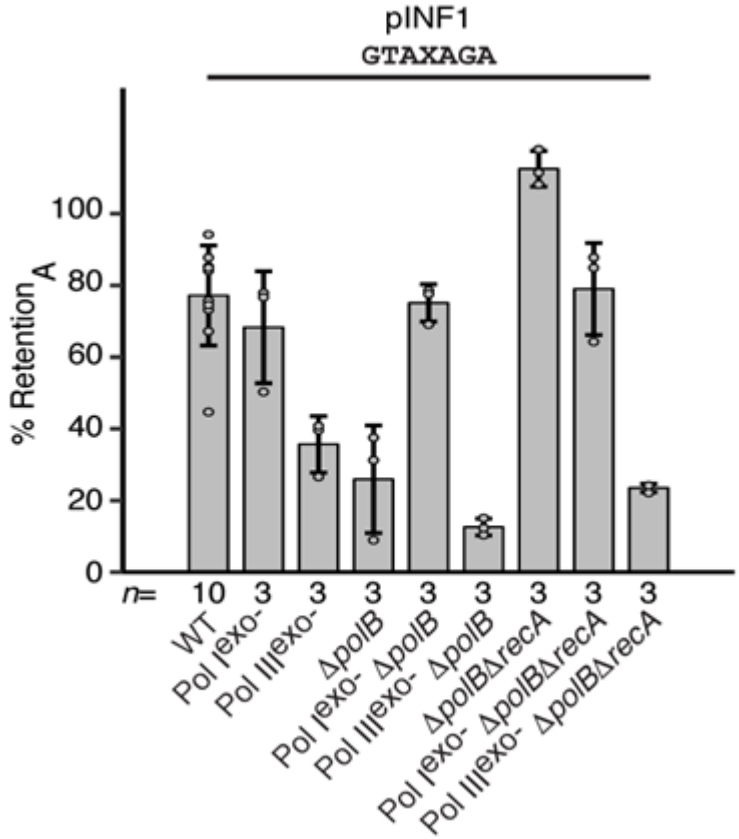

pINF1
GTAXAGA
% Retention A
100
80
60
40
20
0
n=
10 3 3 3 3 3 3 3 3
WT
Pol Iexo-
Pol IIIexo-
ΔpolB
Pol Iexo- ΔpolB
Pol IIIexo- ΔpolB
ΔpolBΔrecA
Pol Iexo- ΔpolBΔrecA
Pol IIIexo- ΔpolBΔrecA

FIG. 2A

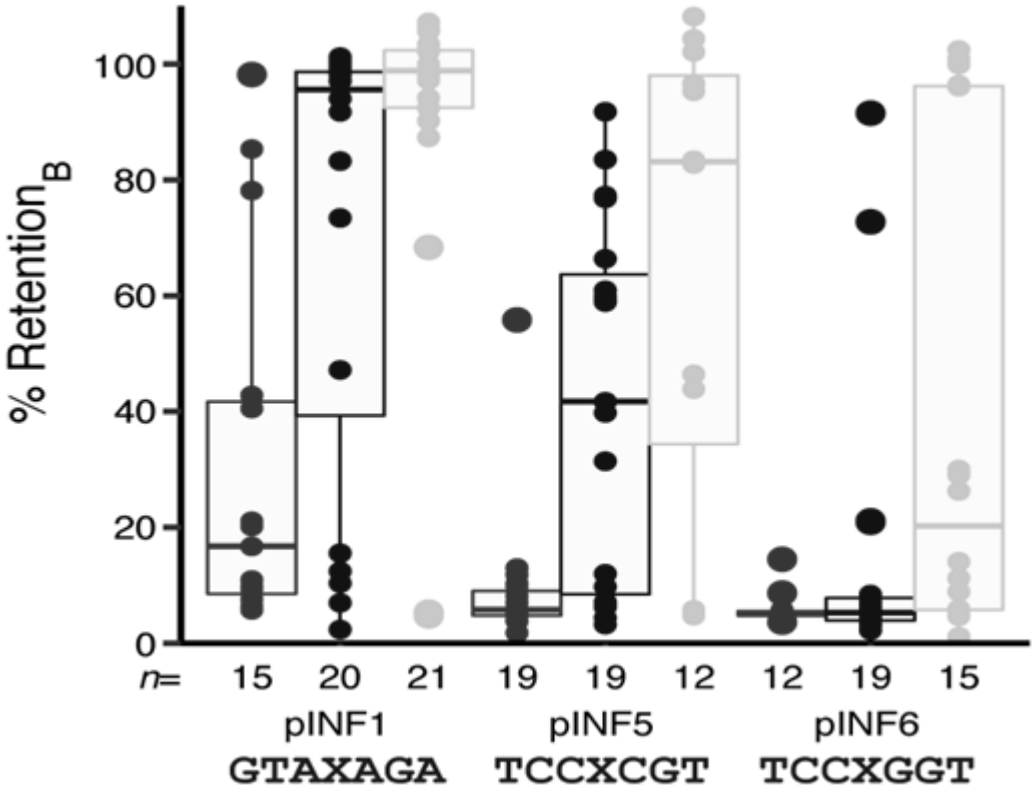

% Retention$_B$
100
80
60
40
20
0
n= 15 20 21 19 19 12 12 19 15
pINF1
GTAXAGA
pINF5
TCCXCGT
pINF6
TCCXGGT

FIG. 2B

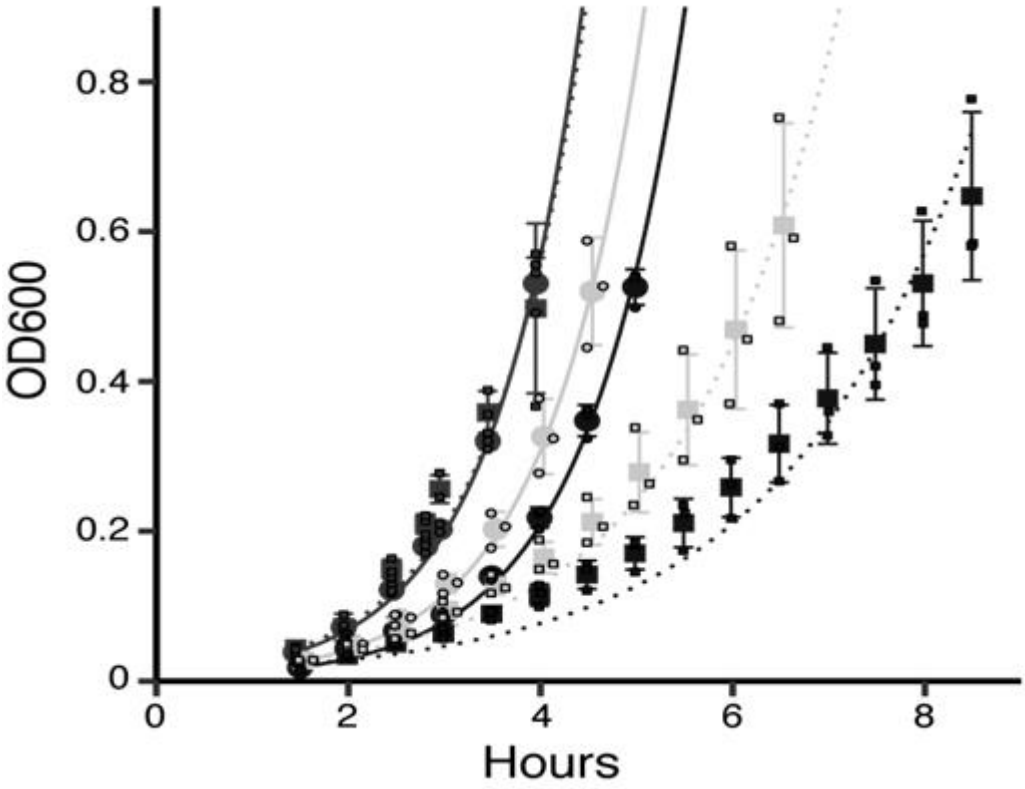

OD600
0.8
0.6
0.4
0.2
0
0
2
4
6
8
Hours

FIG. 2C

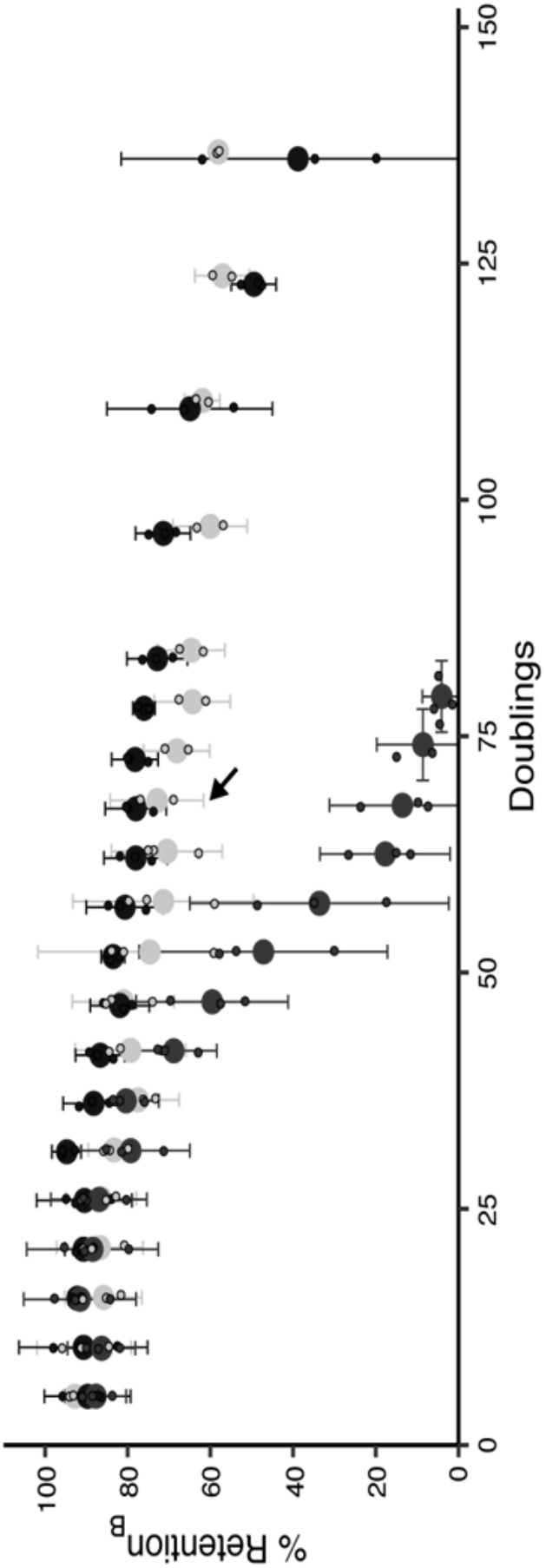


FIG. 3

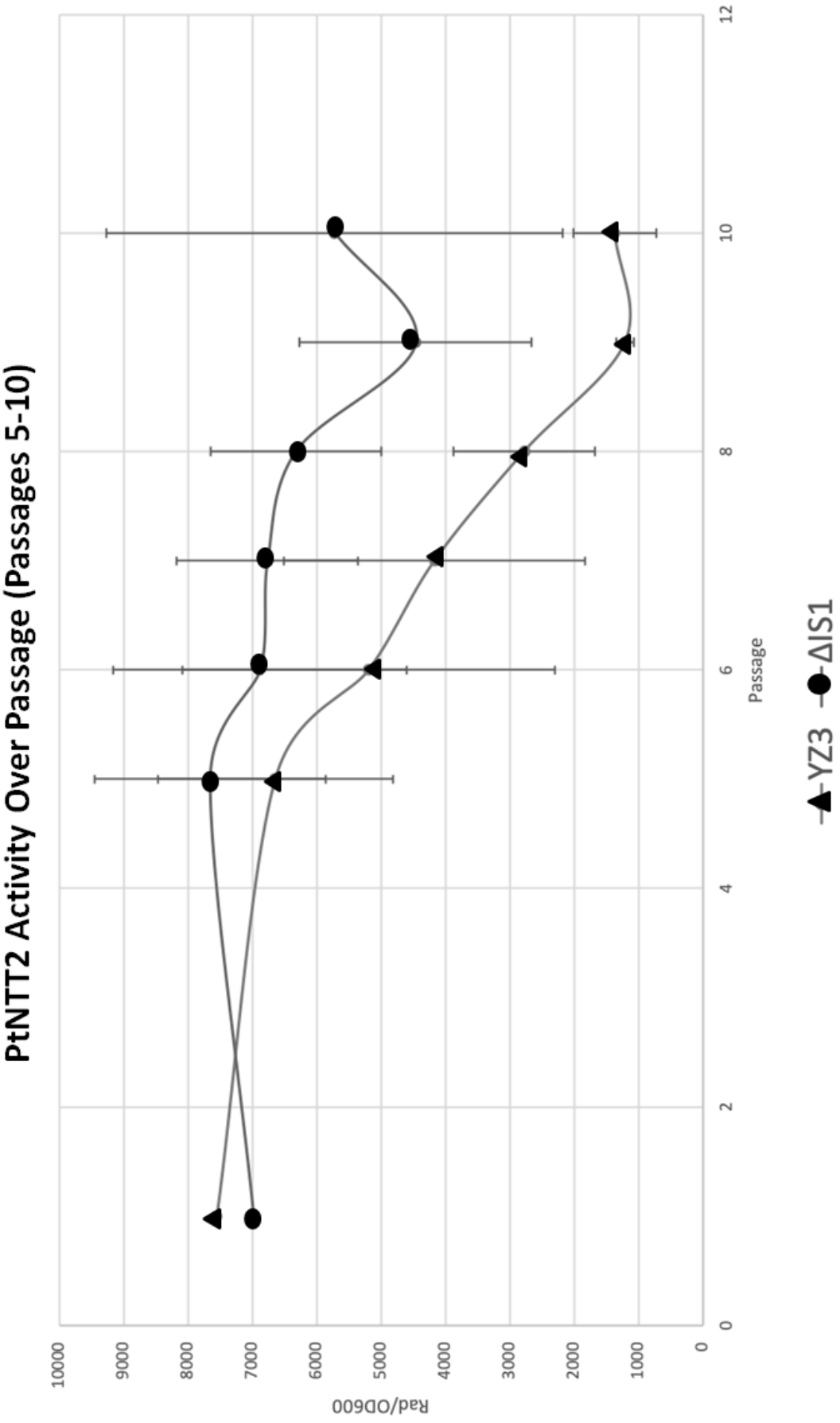

PtNTT2 Activity Over Passage (Passages 5-10)
Rad/OD600
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
0
2
4
6
8
10
12
Passage
YZ3
ΔIS1

FIG. 4A

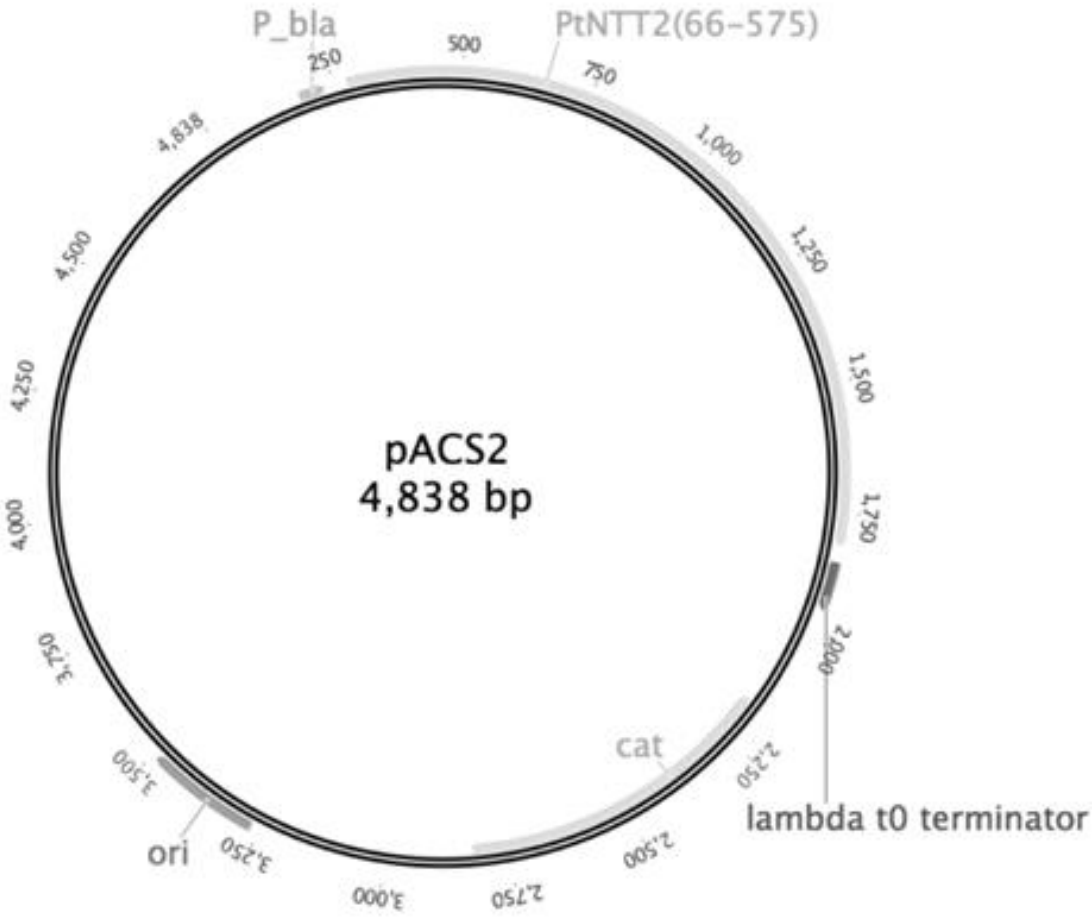

P_bla
PtNTT2(66-575)
pACS2
4,838 bp
cat
ori
lambda t0 terminator
250
500
750
1,000
1,250
1,500
1,750
2,000
2,250
2,500
2,750
3,000
3,250
3,500
3,750
4,000
4,250
4,500
4,838

FIG. 4B

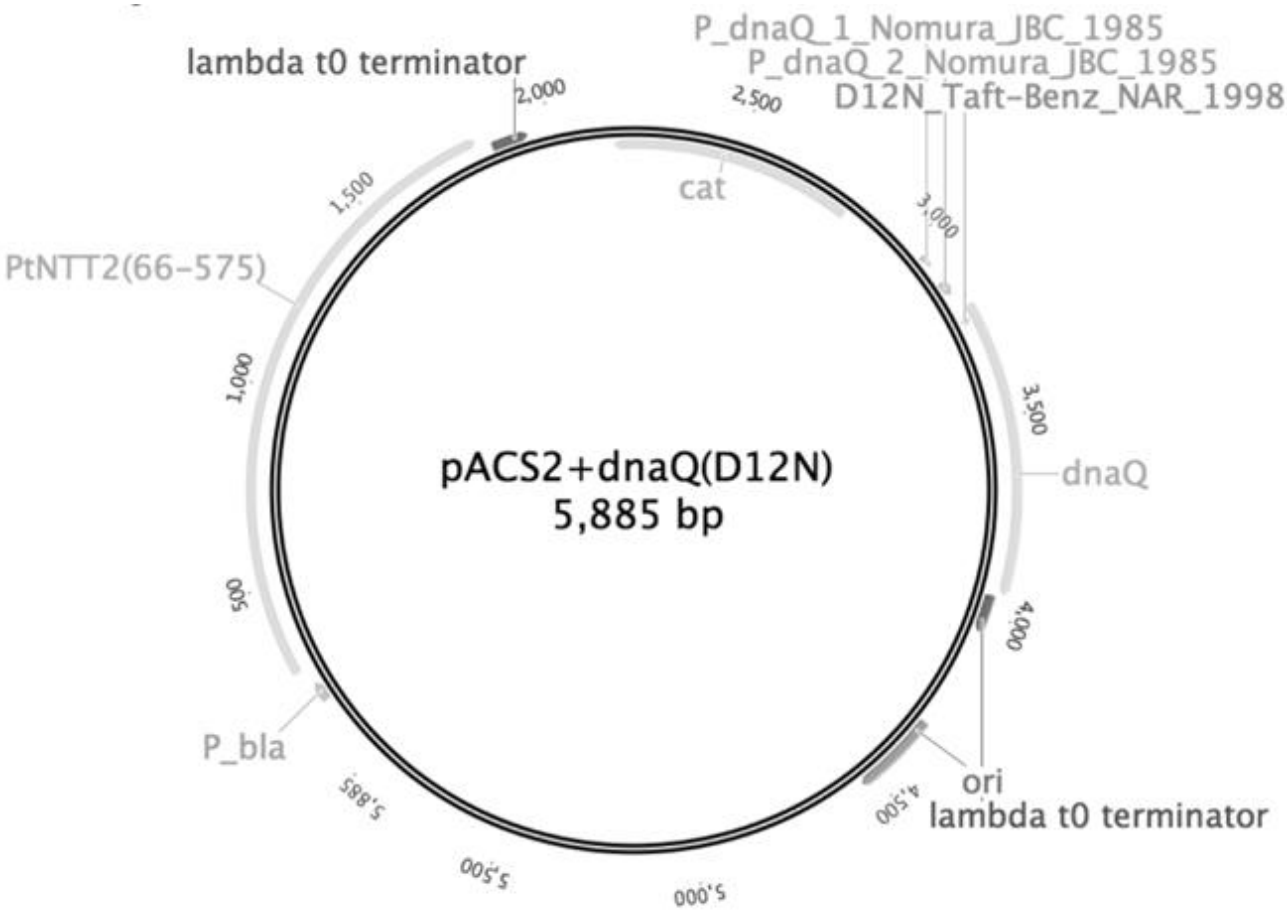

lambda t0 terminator
P_dnaQ_1_Nomura_JBC_1985
P_dnaQ_2_Nomura_JBC_1985
D12N_Taft-Benz_NAR_1998
cat
PtNTT2(66-575)
dnaQ
pACS2+dnaQ(D12N)
5,885 bp
P_bla
ori
lambda t0 terminator
2,000
2,500
3,000
3,500
4,000
4,500
5,000
5,500
5,885
500
1,000
1,500

FIG. 4C

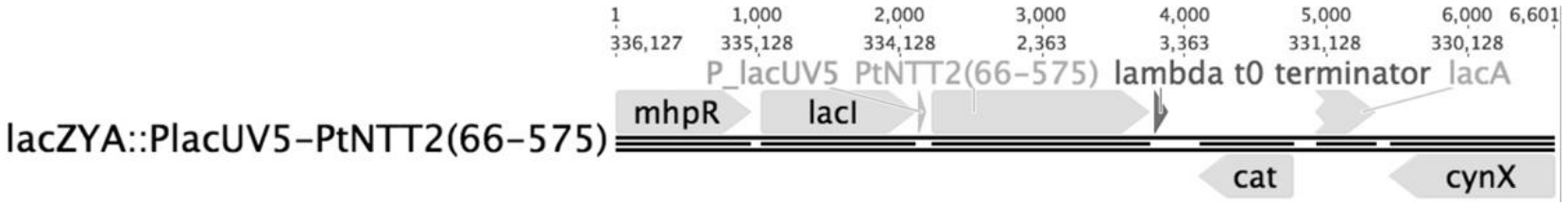

1
1,000
2,000
3,000
4,000
5,000
6,000
6,601
336,127
335,128
334,128
2,363
3,363
331,128
330,128
P_lacUV5
PtNTT2(66-575)
lambda t0 terminator
lacA
mhpR
lacI
lacZYA::PlacUV5-PtNTT2(66-575)
cat
cynX

FIG. 5

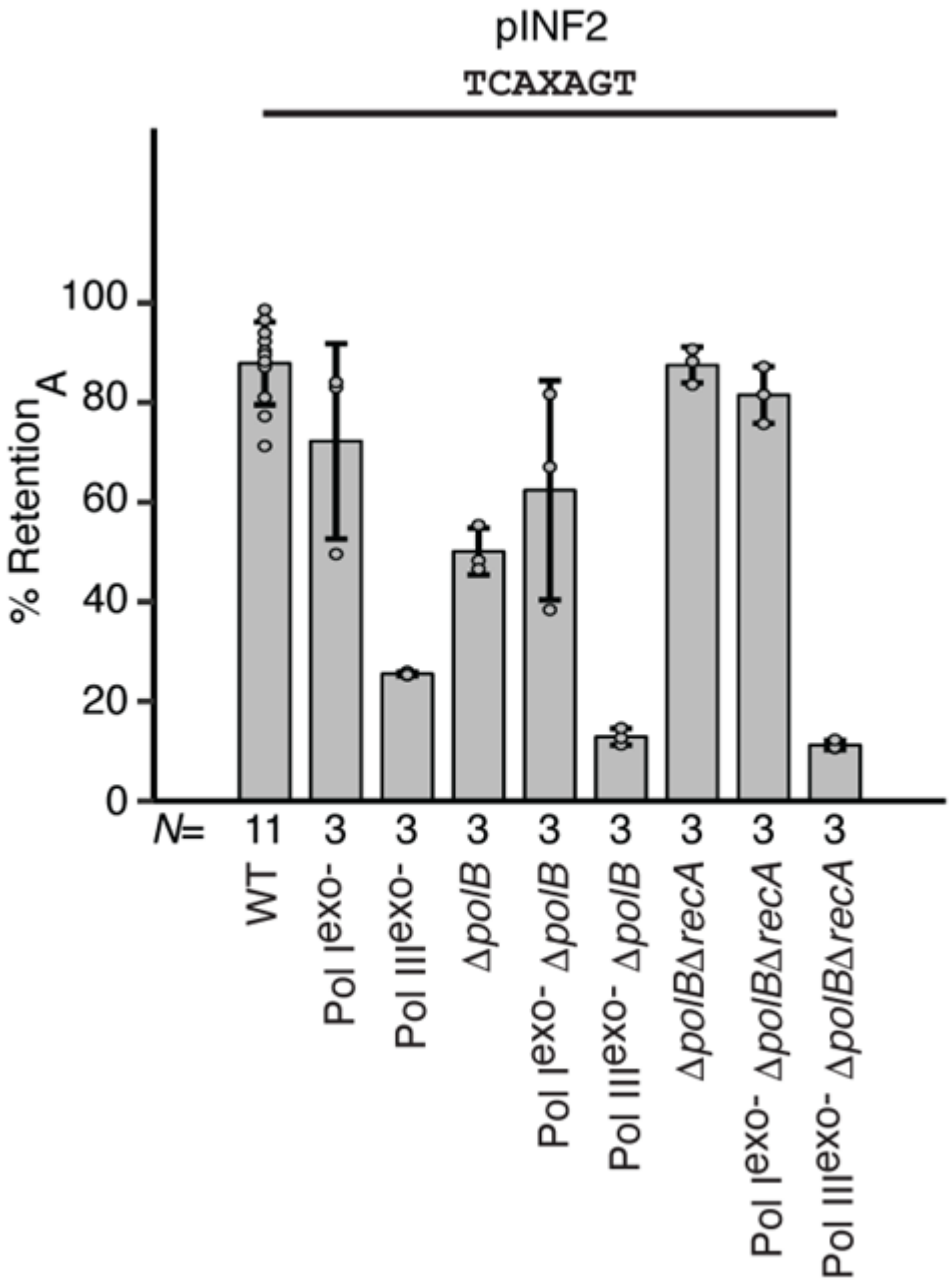

pINF2
TCAXAGT
% Retention A
100
80
60
40
20
0
N=
11
3
3
3
3
3
3
3
3
WT
Pol I exo-
Pol III exo-
ΔpolB
Pol I exo- ΔpolB
Pol III exo- ΔpolB
ΔpolBΔrecA
Pol I exo- ΔpolBΔrecA
Pol III exo- ΔpolBΔrecA

FIG. 6A

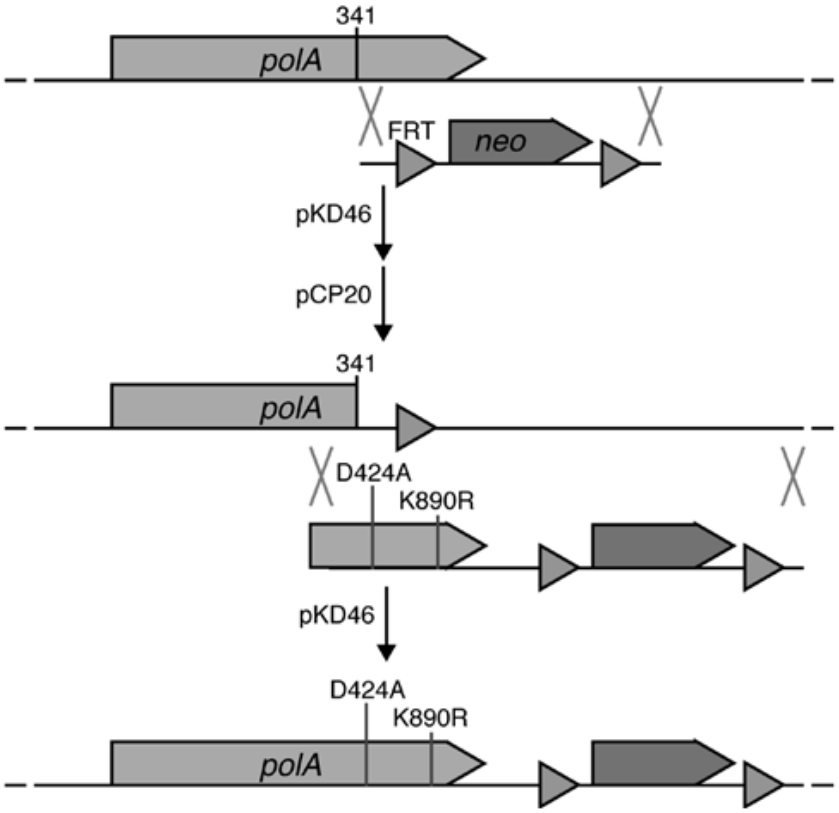

341
polA
FRT
neo
pKD46
pCP20
341
polA
D424A
K890R
pKD46
D424A
K890R
polA

FIG. 6B

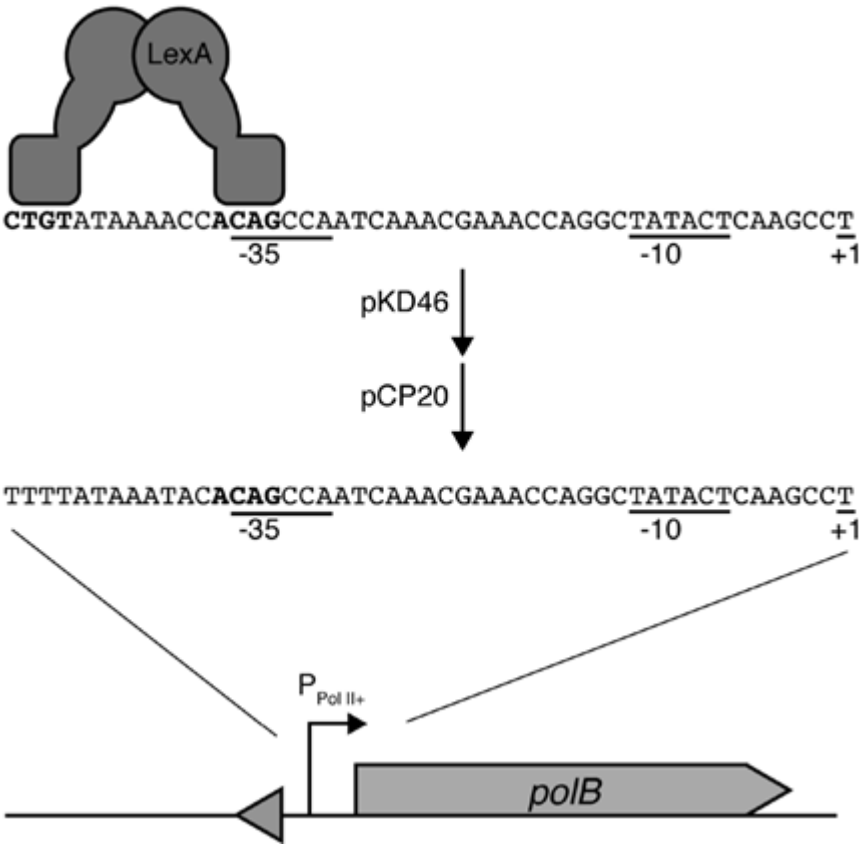

LexA
CTGTATAAAACCACAGCCAATCAAACGAAACCAGGCTATACTCAAGCCT
-35
-10
+1
pKD46
pCP20
TTTTATAAATACACAGCCAATCAAACGAAACCAGGCTATACTCAAGCCT
-35
-10
+1
P Pol II+
polB

FIG. 7A

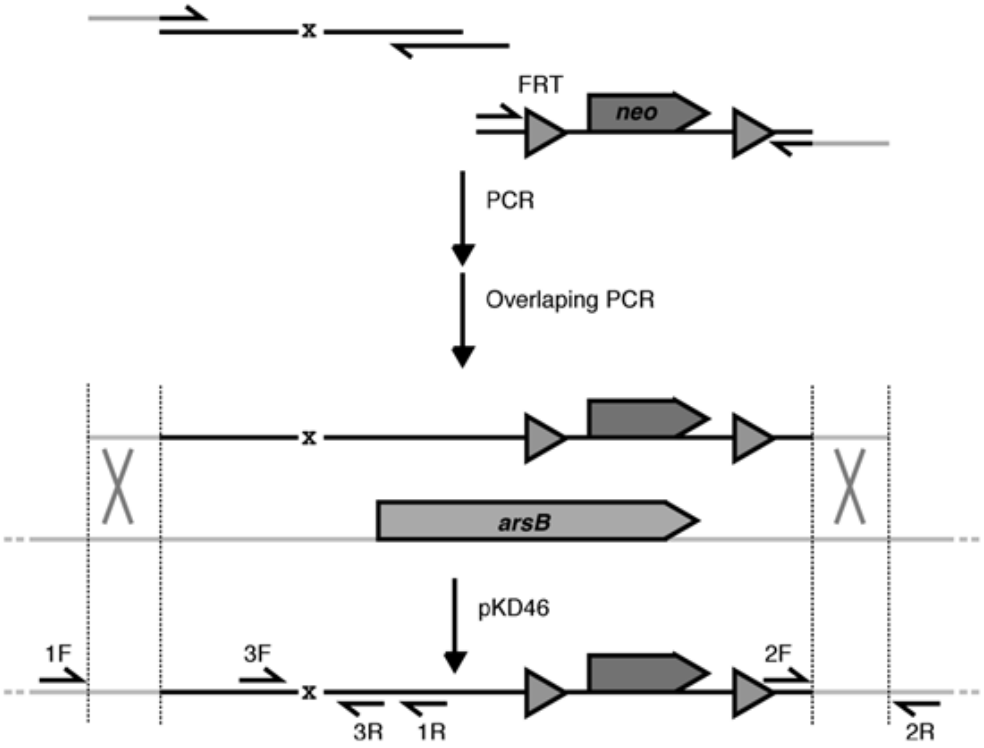
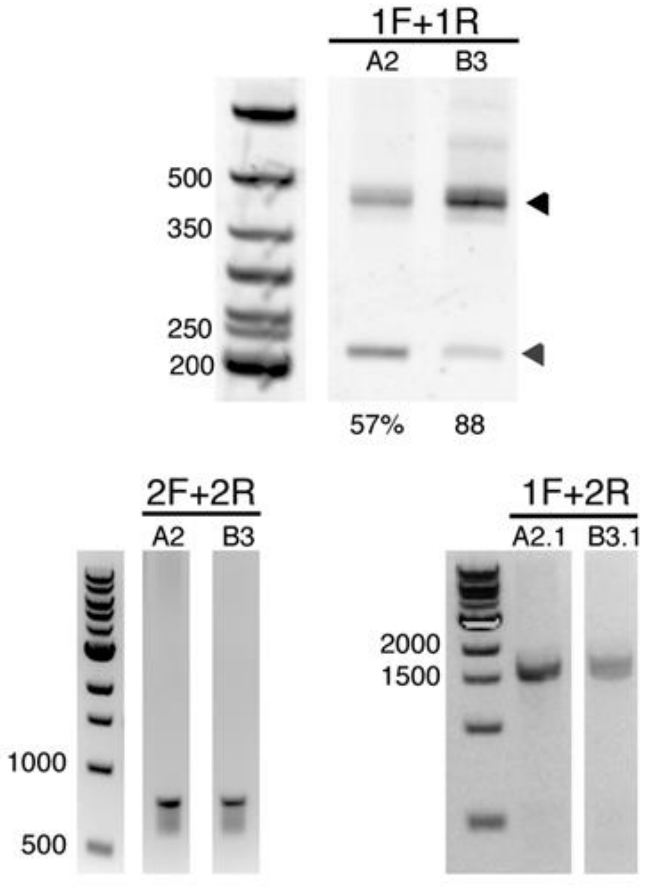

x
FRT
neo
PCR
Overlaping PCR
x
arsB
pKD46
1F
3F
x
2F
3R
1R
2R

FIG. 7B


1F+1R
A2
B3
500
350
250
200
57%
88
2F+2R
A2
B3
1000
500
1F+2R
A2.1
B3.1
2000
1500

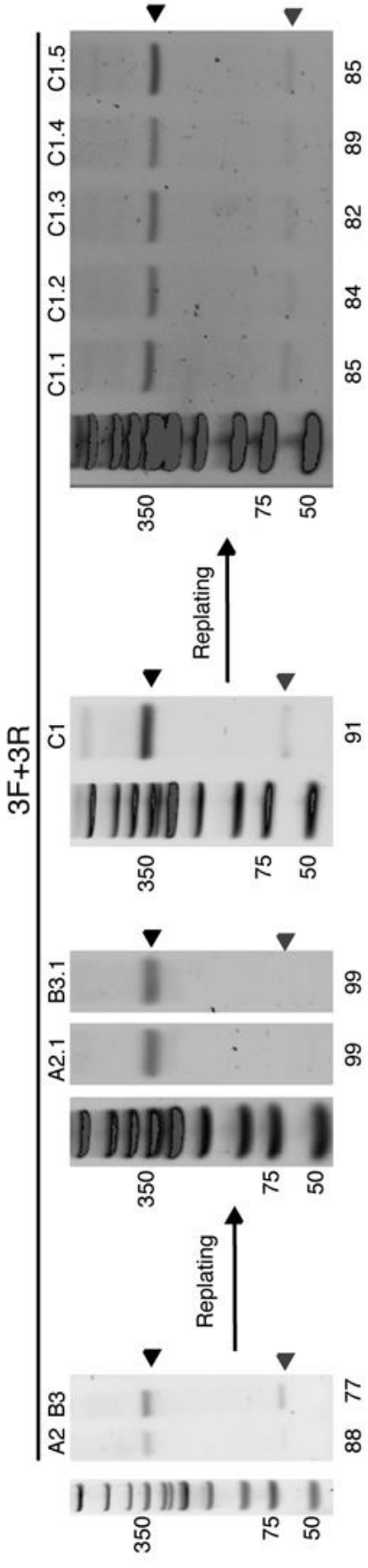

3F+3R
A2
B3
350
75
50
77
88
Replating
A2.1
B3.1
99
99
C1
91
C1.1
C1.2
C1.3
C1.4
C1.5
85
84
82
89
85

FIG. 7C

FIG. 8A

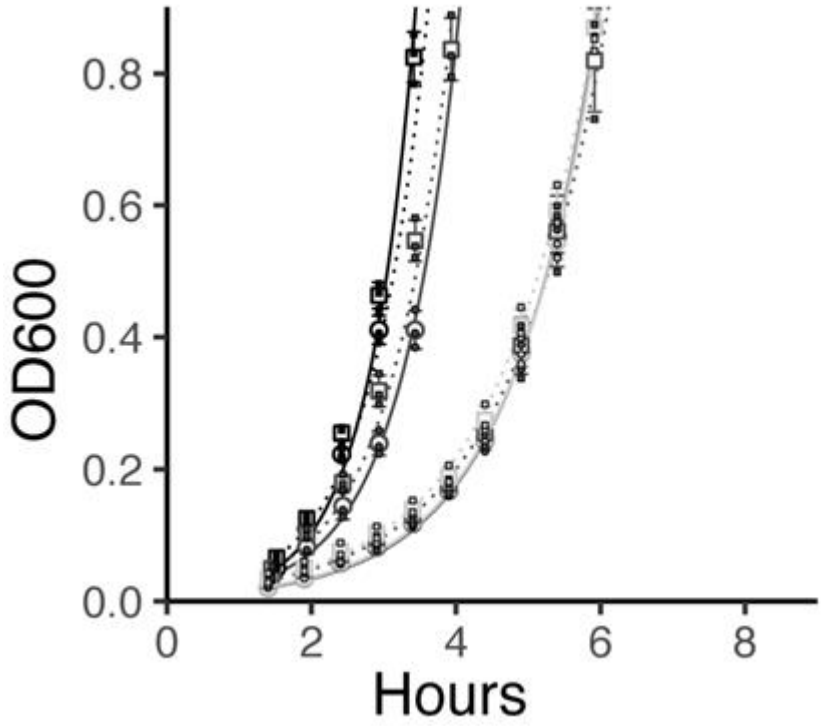


FIG. 8B

Strain	Chromosomal UBP	d**NaM**TP-d**TPT3**TP	Doubling Time Mean (minutes)	S.D.
lacZYA::cat	-	+	27.802	0.243
		-	33.381	0.463
WT-Opt	-	+	34.474	2.570
		-	35.929	0.264
	+	+	39.443	0.795
		-	41.530	2.545
ΔrecA-Opt	-	+	50.540	0.820
		-	58.608	4.314
	+	+	42.892	1.371
		-	83.312	6.996
Pol II+ΔrecA-Opt	-	+	51.556	1.907
		-	58.060	3.030
	+	+	42.061	1.255
		-	67.114	5.052

FIG. 9A

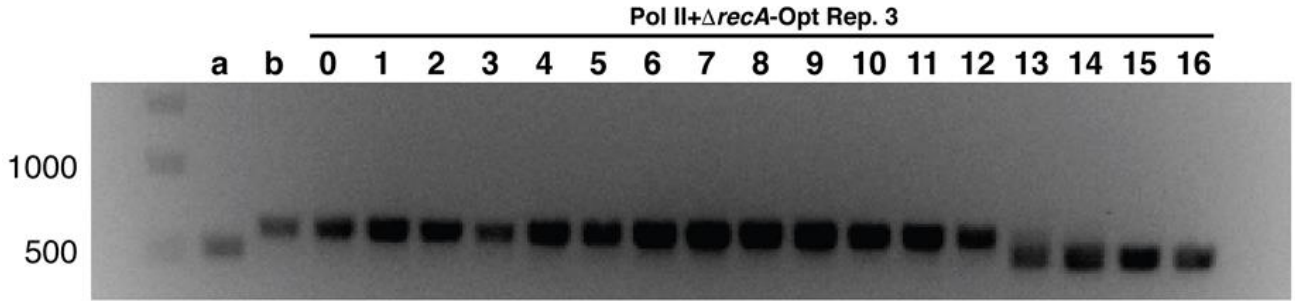

Pol II+ΔrecA-Opt Rep. 3
a b 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
1000
500

FIG. 9B

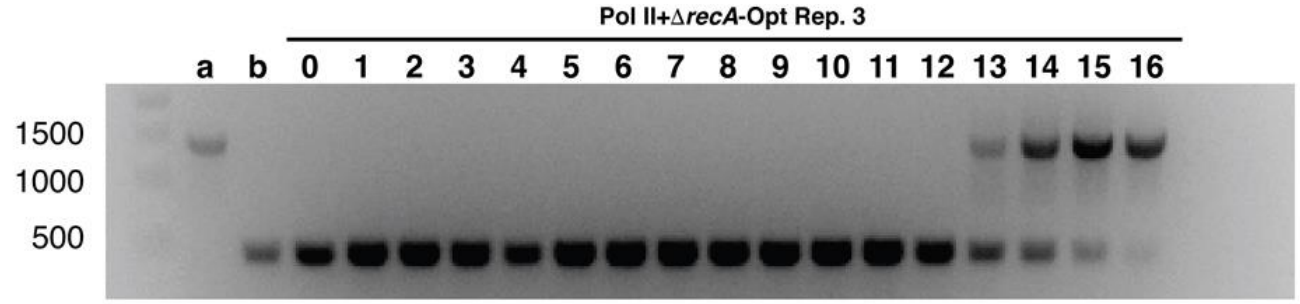

Pol II+ΔrecA-Opt Rep. 3
a b 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
1500
1000
500

FIG. 10A

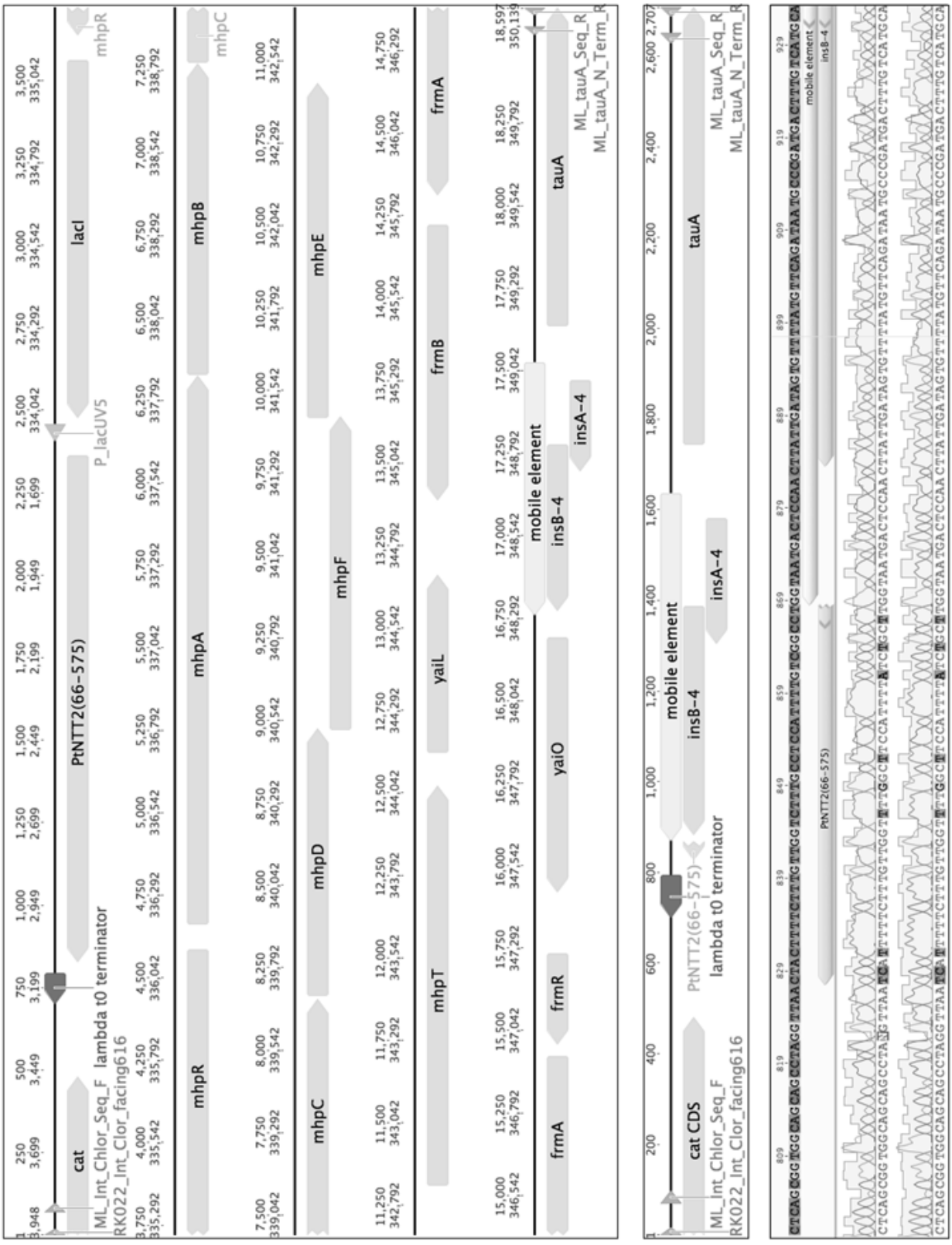
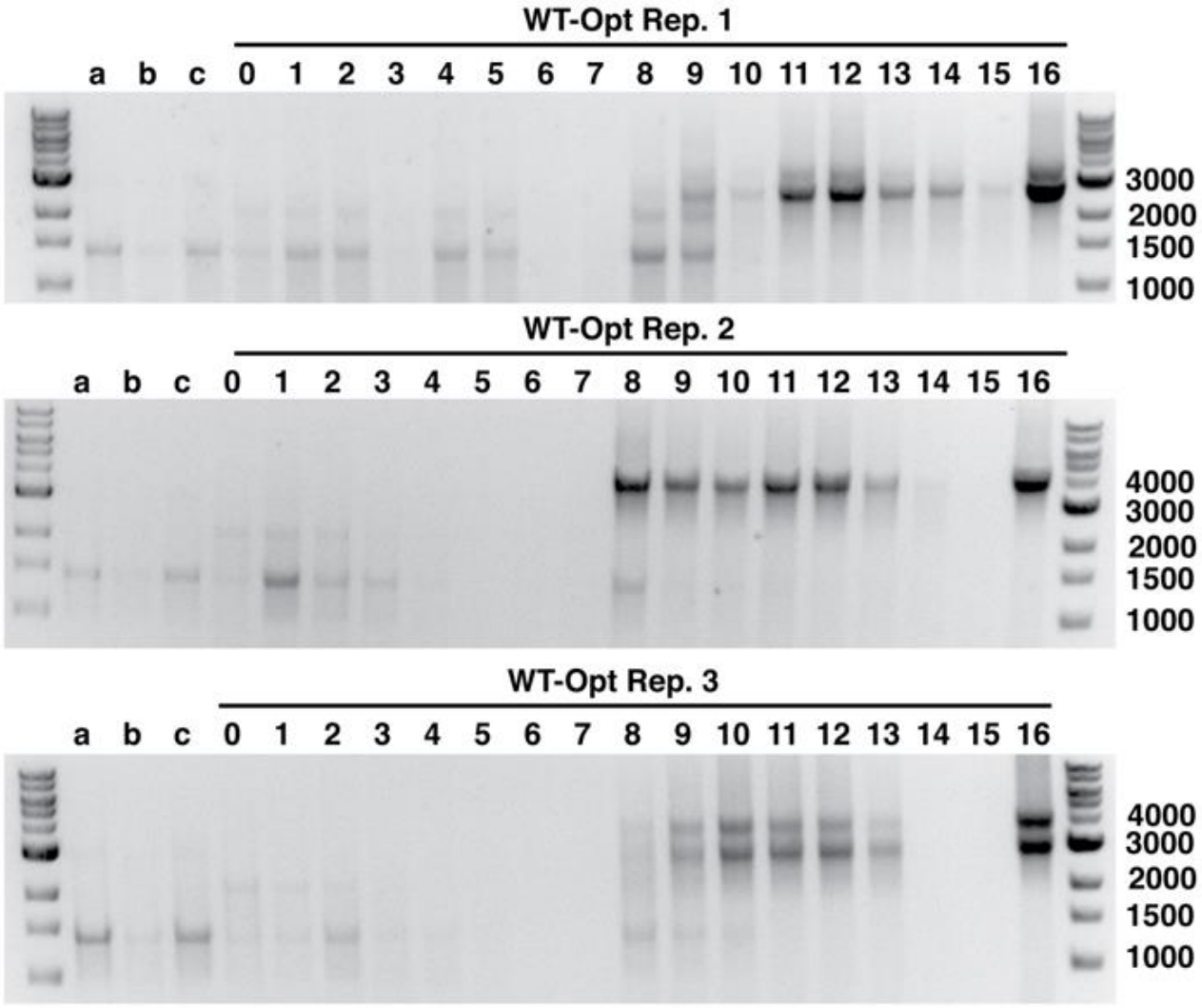

cat
PtNTT2(66-575)
lacI
mhpR
P_lacUV5
ML_Int_Chlor_Seq_F
lambda t0 terminator
RK022_Int_Clor_facing616
mhpA
mhpB
mhpC
mhpD
mhpF
mhpE
mhpT
yaiL
frmB
frmA
yaiO
mobile element
insB-4
insA-4
tauA
frmR
ML_tauA_Seq_R
ML_tauA_N_Term_R
cat CDS
PtNTT2(66-575)
lambda t0 terminator
ML_Int_Chlor_Seq_F
RK022_Int_Clor_facing616
mobile element
insB-4
insA-4
tauA
ML_tauA_Seq_R
ML_tauA_N_Term_R
PtNTT2(66-575)
mobile element
insB-4

FIG. 10B


WT-Opt Rep. 1
a b c 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
3000
2000
1500
1000
WT-Opt Rep. 2
a b c 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
4000
3000
2000
1500
1000
WT-Opt Rep. 3
a b c 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
4000
3000
2000
1500
1000