

**Table S1**

Template	Name	Sequence
<b>galP1<sup>+</sup>P2<sup>+</sup>P3<sup>+</sup></b>	P1-WT	5'-TTT TCG CAT CTT TGT TAT GCT ATG GTT ATT TCA TAC CAT AAG CCT AAT GGA GCG AAT TAT GAG-3' 3'-AAA AGC GTA GAA ACA ATA CGA TAC CAA TAA AGT ATG GTA TTC GGA TTA CCT CGC TTA ATA CTC-5'
<b>galP1<sup>+</sup>P2<sup>+</sup>P3<sup>+</sup></b>	P1	5'-TTT TCG CAT CTT TTC GTT GCT ATG GTT ATT TCA TAC CAT AAG CCT AAT GGA GCG AAT TAT GAG-3' 3'-AAA AGC GTA GAA AAG CAA CGA TAC CAA TAA AGT ATG GTA TTC GGA TTA CCT CGC TTA ATA CTC-5'
<b>galP1(T-15G)P2<sup>+</sup>P3<sup>+</sup></b>	P1T15G	5'-TTT TCG CAT CTT TTC GTG GCT ATG GTT ATT TCA TAC CAT AAG CCT AAT GGA GCG AAT TAT GAG-3' 3'-AAA AGC GTA GAA AAG CAC CGA TAC CAA TAA AGT ATG GTA TTC GGA TTA CCT CGC TTA ATA CTC-5'
<b>galP1(G-14T)P2<sup>+</sup>P3<sup>+</sup></b>	P1G14T	5'-TTT TCG CAT CTT TTC GTT TCT ATG GTT ATT TCA TAC CAT AAG CCT AAT GGA GCG AAT TAT GAG-3' 3'-AAA AGC GTA GAA AAG CAA AGA TAC CAA TAA AGT ATG GTA TTC GGA TTA CCT CGC TTA ATA CTC-5'
<b>galP1(C-13A)P2<sup>+</sup>P3<sup>+</sup></b>	P1C13A	5'-TTT TCG CAT CTT TTC GTT GAT ATG GTT ATT TCA TAC CAT AAG CCT AAT GGA GCG AAT TAT GAG-3' 3'-AAA AGC GTA GAA AAG CAA CTA TAC CAA TAA AGT ATG GTA TTC GGA TTA CCT CGC TTA ATA CTC-5'
<b>galP1(T-12G)P2<sup>+</sup>P3<sup>+</sup></b>	P1T12G	5'-TTT TCG CAT CTT TTC GTT GCG ATG GTT ATT TCA TAC CAT AAG CCT AAT GGA GCG AAT TAT GAG-3' 3'-AAA AGC GTA GAA AAG CAA CGC TAC CAA TAA AGT ATG GTA TTC GGA TTA CCT CGC TTA ATA CTC-5'
<b>galP1(A-11C)P2<sup>+</sup>P3<sup>+</sup></b>	P1A11C	5'-TTT TCG CAT CTT TTC GTT GCT CTG GTT ATT TCA TAC CAT AAG CCT AAT GGA GCG AAT TAT GAG-3' 3'-AAA AGC GTA GAA AAG CAA CGA GAC CAA TAA AGT ATG GTA TTC GGA TTA CCT CGC TTA ATA CTC-5'
<b>galP1(T-10G)P2<sup>+</sup>P3<sup>+</sup></b>	P1T10G	5'-TTT TCG CAT CTT TTC GTT GCT AGG GTT ATT TCA TAC CAT AAG CCT AAT GGA GCG AAT TAT GAG-3' 3'-AAA AGC GTA GAA AAG CAA CGA TCC CAA TAA AGT ATG GTA TTC GGA TTA CCT CGC TTA ATA CTC-5'
<b>galP1(G-9T)P2<sup>+</sup>P3<sup>+</sup></b>	P1G9T	5'-TTT TCG CAT CTT TTC GTT GCT ATT GTT ATT TCA TAC CAT AAG CCT AAT GGA GCG AAT TAT GAG-3' 3'-AAA AGC GTA GAA AAG CAA CGA TAA CAA TAA AGT ATG GTA TTC GGA TTA CCT CGC TTA ATA CTC-5'
<b>galP1(G-8T)P2<sup>+</sup>P3<sup>+</sup></b>	P1G8T	5'-TTT TCG CAT CTT TTC GTT GCT ATG TTT ATT TCA TAC CAT AAG CCT AAT GGA GCG AAT TAT GAG-3' 3'-AAA AGC GTA GAA AAG CAA CGA TAC AAA TAA AGT ATG GTA TTC GGA TTA CCT CGC TTA ATA CTC-5'
<b>galP1(T-7G)P2<sup>+</sup>P3<sup>+</sup></b>	P1T7G	5'-TTT TCG CAT CTT TTC GTT GCT ATG GGT ATT TCA TAC CAT AAG CCT AAT GGA GCG AAT TAT GAG-3' 3'-AAA AGC GTA GAA AAG CAA CGA TAC CCA TAA AGT ATG GTA TTC GGA TTA CCT CGC TTA ATA CTC-5'
<b>galP1(G-14T,T-10G,G-8T)P2<sup>+</sup>P3<sup>+</sup></b>	P1TripleM	5'-TTT TCG CAT CTT TTC GTT TCT AGG TTT ATT TCA TAC CAT AAG CCT AAT GGA GCG AAT TAT GAG-3' 3'-AAA AGC GTA GAA AAG CAA AGA TCC AAA TAA AGT ATG GTA TTC GGA TTA CCT CGC TTA ATA CTC-5'
<b>galP1<sup>-</sup>P2<sup>-</sup>P3<sup>+</sup></b>	P1Minus	5'-TTT TCG CAT CTT TTC GTT ACT GCC CCT ATT TCA TAC CAT AAG CCT AAT GGA GCG AAT TAT GAG-3' 3'-AAA AGC GTA GAA AAG CAA TGA CGG GGA TAA AGT ATG GTA TTC GGA TTA CCT CGC TTA ATA CTC-5'

**Table S2**

Template	Name	Sequence
<i>galP1</i> <sup>+</sup> <i>P2</i> <sup>-</sup> <i>P3</i> <sup>-</sup>	P1*	5'-TTT TCG CAT CTT TTT TAG GAT ATG GTT ATT TAA TAA CCT AAG CCT AAT GGA GCG AAT TAT GAG-3' 3'-AAA AGC GTA GAA AAA ATC CTA TAC CAA TAA ATT ATT GGA TTC GGA TTA CCT CGC TTA ATA CTC-5'
<i>galP1</i> (G-14T) <i>P2</i> <sup>-</sup> <i>P3</i> <sup>-</sup>	P1*G14T	5'-TTT TCG CAT CTT TTT TAG TAT ATG GTT ATT TAA TAA CCT AAG CCT AAT GGA GCG AAT TAT GAG-3' 3'-AAA AGC GTA GAA AAA ATC ATA TAC CAA TAA ATT ATT GGA TTC GGA TTA CCT CGC TTA ATA CTC-5'
<i>galP1</i> (T-12G) <i>P2</i> <sup>-</sup> <i>P3</i> <sup>-</sup>	P1*T12G	5'-TTT TCG CAT CTT TTT TAG GAG ATG GTT ATT TAA TAA CCT AAG CCT AAT GGA GCG AAT TAT GAG-3' 3'-AAA AGC GTA GAA AAA ATC CTC TAC CAA TAA ATT ATT GGA TTC GGA TTA CCT CGC TTA ATA CTC-5'
<i>galP1</i> (A-11C) <i>P2</i> <sup>-</sup> <i>P3</i> <sup>-</sup>	P1*A11C	5'-TTT TCG CAT CTT TTT TAG GAT CTG GTT ATT TAA TAA CCT AAG CCT AAT GGA GCG AAT TAT GAG-3' 3'-AAA AGC GTA GAA AAA ATC CTA GAC CAA TAA ATT ATT GGA TTC GGA TTA CCT CGC TTA ATA CTC-5'
<i>galP1</i> (T-10G) <i>P2</i> <sup>-</sup> <i>P3</i> <sup>-</sup>	P1*T10G	5'-TTT TCG CAT CTT TTT TAG GAT AGG GTT ATT TAA TAA CCT AAG CCT AAT GGA GCG AAT TAT GAG-3' 3'-AAA AGC GTA GAA AAA ATC CTA TCC CAA TAA ATT ATT GGA TTC GGA TTA CCT CGC TTA ATA CTC-5'
<i>galP1</i> (G-8T) <i>P2</i> <sup>-</sup> <i>P3</i> <sup>-</sup>	P1*G8T	5'-TTT TCG CAT CTT TTT TAG GAT ATG TTT ATT TAA TAA CCT AAG CCT AAT GGA GCG AAT TAT GAG-3' 3'-AAA AGC GTA GAA AAA ATC CTA TAC AAA TAA ATT ATT GGA TTC GGA TTA CCT CGC TTA ATA CTC-5'

**Table S3**

Template	Name	Sequence
<i>galP1</i> <sup>+</sup> <i>P2</i> <sup>-</sup>	P1-21	5'-TTC GTT GCT ATG GTT ATT TCA-3' 3'-AAG CAA CGA TAC CAA TAA AGT-5'
<i>galP1</i> (G-14T,T-10G,G-8T) <i>P2</i> <sup>-</sup>	P1-21- TripleM	5'-TTC GTT TCT AGG TTT ATT TCA-3' 3'-AAG CAA AGA TCC AAA TAA AGT-5'
poly-dAT	dAT-20	5'-AAA AAA TTT ATT TTA AAT TT-3' 3'-TTT TTT AAA TAA AAT TTA AA-5'

*P1*<sup>+</sup> means (G-14A, A-11G, T-10C, G-9C, G-8C, T-7C, indicated by blue colour) with respect to +1P1. *P2*<sup>-</sup> means (G-14T, T-13C, T-12G, A-11T, indicated by green colour) with respect to +1P2. *P2*<sup>-</sup> means (G-14T, T-10G, C-8A, indicated by pink colour) with respect to +1P2. *P3*<sup>-</sup> means (C-14A, C-10A, A-8C, indicated by orange colour) with respect to +1P3. Red colour indicated point mutation at *P1*.

**Table S4**

<b>TEMPLATE</b>	<b>NAME</b>	<b>SEQUENCE</b>
<b><math>P_R</math>(WT)</b>	PR	5'-GCG TGT TGA CTA TTT TAC CTC TGG CGG TGA TAA TGG TTG CAT GTA CTA AGG AGG TTG TAT GGA ACA ACG CA-3'  3'-CGC ACA ACT GAT AAA ATG GAG ACC GCC ACT ATT ACC AAC GTA CAT GAT TCC TCC AAC ATA CCT TGT TGC GT-5'
<b><math>P_R</math>(G-15T)</b>	PRG15T	5'-GCG TGT TGA CTA TTT TAC CTC TGG <b>CTG</b> TGA TAA TGG TTG CAT GTA CTA AGG AGG TTG TAT GGA ACA ACG CA-3'  3'-CGC ACA ACT GAT AAA ATG GAG ACC <b>GAC</b> ACT ATT ACC AAC GTA CAT GAT TCC TCC AAC ATA CCT TGT TGC GT-5'
<b><math>P_R</math>(G-14T)</b>	PRG14T	5'-GCG TGT TGA CTA TTT TAC CTC TGG <b>CGT</b> TGA TAA TGG TTG CAT GTA CTA AGG AGG TTG TAT GGA ACA ACG CA-3'  3'-CGC ACA ACT GAT AAA ATG GAG ACC <b>GCA</b> ACT ATT ACC AAC GTA CAT GAT TCC TCC AAC ATA CCT TGT TGC GT-5'
<b><math>P_R</math>(T-13G)</b>	PRT13G	5'-GCG TGT TGA CTA TTT TAC CTC TGG CGG <b>GGA</b> TAA TGG TTG CAT GTA CTA AGG AGG TTG TAT GGA ACA ACG CA-3'  3'-CGC ACA ACT GAT AAA ATG GAG ACC GCC <b>CCT</b> ATT ACC AAC GTA CAT GAT TCC TCC AAC ATA CCT TGT TGC GT-5'
<b><math>P_R</math>(G-12T)</b>	PRG12T	5'-GCG TGT TGA CTA TTT TAC CTC TGG CGG <b>TA</b> TAA TGG TTG CAT GTA CTA AGG AGG TTG TAT GGA ACA ACG CA-3'  3'-CGC ACA ACT GAT AAA ATG GAG ACC GCC <b>AAT</b> ATT ACC AAC GTA CAT GAT TCC TCC AAC ATA CCT TGT TGC GT-5'
<b><math>P_R</math>(A-11C)</b>	PRA11C	5'-GCG TGT TGA CTA TTT TAC CTC TGG CGG <b>TGC</b> TAA TGG TTG CAT GTA CTA AGG AGG TTG TAT GGA ACA ACG CA-3'  3'-CGC ACA ACT GAT AAA ATG GAG ACC GCC <b>ACG</b> ATT ACC AAC GTA CAT GAT TCC TCC AAC ATA CCT TGT TGC GT-5'
<b><math>P_R</math>(T-10G)</b>	PRT10G	5'-GCG TGT TGA CTA TTT TAC CTC TGG CGG TGA <b>GAA</b> TGG TTG CAT GTA CTA AGG AGG TTG TAT GGA ACA ACG CA-3' 3'-CGC ACA ACT GAT AAA ATG GAG ACC GCC ACT <b>CTT</b> ACC AAC GTA CAT GAT TCC TCC AAC ATA CCT TGT TGC GT-5'
<b><math>P_R</math>(A-9C)</b>	PRA9C	5'-GCG TGT TGA CTA TTT TAC CTC TGG CGG TGA <b>TCA</b> TGG TTG CAT GTA CTA AGG AGG TTG TAT GGA ACA ACG CA-3'  3'-CGC ACA ACT GAT AAA ATG GAG ACC GCC ACT <b>AGT</b> ACC AAC GTA CAT GAT TCC TCC AAC ATA CCT TGT TGC GT-5'
<b><math>P_R</math>(A-8C)</b>	PRA8C	5'-GCG TGT TGA CTA TTT TAC CTC TGG CGG TGA <b>TAC</b> TGG TTG CAT GTA CTA AGG AGG TTG TAT GGA ACA ACG CA-3'  3'-CGC ACA ACT GAT AAA ATG GAG ACC GCC ACT <b>ATG</b> ACC AAC GTA CAT GAT TCC TCC AAC ATA CCT TGT TGC GT-5'
<b><math>P_R</math>(T-7C)</b>	PRT7C	5'-GCG TGT TGA CTA TTT TAC CTC TGG CGG TGA TAA <b>CGG</b> TTG CAT GTA CTA AGG AGG TTG TAT GGA ACA ACG CA-3'  3'-CGC ACA ACT GAT AAA ATG GAG ACC GCC ACT ATT <b>GCC</b> AAC GTA CAT GAT TCC TCC AAC ATA CCT

TGT TGC GT-5'		
<b><math>P_R(\text{G-12T}, \text{T-7C})</math></b>	PRMT7C	5'-GCG TGT TGA CTA TTT TAC CTC TGG CGG TTA TAA CGG TTG CAT GTA CTA AGG AGG TTG TAT GGA ACA ACG CA-3' 3'-CGC ACA ACT GAT AAA ATG GAG ACC GCC AAT ATT GCC AAC GTA CAT GAT TCC TCC AAC ATA CCT TGT TGC GT-5'
<b><math>P_R(\text{G-12T}, \text{A-11C})</math></b>	PRMA11C	5'-GCG TGT TGA CTA TTT TAC CTC TGG CGG TTC TAA TGG TTG CAT GTA CTA AGG AGG TTG TAT GGA ACA ACG CA-3' 3'-CGC ACA ACT GAT AAA ATG GAG ACC GCC AAG ATT ACC AAC GTA CAT GAT TCC TCC AAC ATA CCT TGT TGC GT-5'
<b><math>P_R(\text{G-12T}, \text{T-35C})</math></b>	PRMT35C	5'-GCG TGC TGA CTA TTT TAC CTC TGG CGG TTA TAA TGG TTG CAT GTA CTA AGG AGG TTG TAT GGA ACA ACG CA-3' 3'-CGC ACG ACT GAT AAA ATG GAG ACC GCC AAT ATT ACC AAC GTA CAT GAT TCC TCC AAC ATA CCT TGT TGC GT-5'

**Table S5**

<b>Template</b>	<b>Name</b>	<b><math>K_d^{\text{act}}</math> (nM), 4<sup>o</sup>C</b>
<b><math>galP1^+P2^+P3^+</math></b>	P1-WT	0.66± 0.4
<b><math>galP1^+P2^-P3^+</math></b>	P1	1.3±0.2
<b><math>galP1(\text{T-15G})P2^-P3^+</math></b>	P1T15G	1.8±0.4
<b><math>galP1(\text{G-14T})P2^-P3^+</math></b>	P1G14T	1.6±0.2
<b><math>galP1(\text{C-13A})P2^-P3^+</math></b>	P1C13A	0.9±0.1
<b><math>galP1(\text{T-12G})P2^-P3^+</math></b>	P1T12G	1.4±0.2
<b><math>galP1(\text{A-11C})P2^-P3^+</math></b>	P1A11C	1.6±0.4
<b><math>galP1(\text{T-10G})P2^-P3^+</math></b>	P1T10G	5.9±1.0
<b><math>galP1(\text{G-9T})P2^-P3^+</math></b>	P1G9T	1.2±0.2
<b><math>galP1(\text{G-8T})P2^-P3^+</math></b>	P1G8T	3.2±0.4
<b><math>galP1(\text{T-7G})P2^-P3^+</math></b>	P1T7G	1.2±0.2
<b><math>galP1(\text{G-14T}, \text{T-10G}, \text{G-8T})P2^-P3^+</math></b>	P1TripleM	6.0±0.8
<b><math>galP1^-P2^-P3^+</math></b>	P1Minus	6.2±0.6

**Table S6**

<i>Template</i>	<i>Name</i>	$K_d^{\text{act}}$ (nM), 4 <sup>o</sup> C
<i>galP1<sup>+</sup>P2<sup>-</sup>P3<sup>-</sup></i>	P1*	0.65±0.3
<i>galP1(G-14T)P2<sup>-</sup>P3<sup>-</sup></i>	P1*G14T	0.70±0.3
<i>galP1(T-12G)P2<sup>-</sup>P3<sup>-</sup></i>	P1*T12G	1.87±0.2
<i>galP1(A-11C)P2<sup>-</sup>P3<sup>-</sup></i>	P1*A11C	1.09±0.6
<i>galP1(T-10G)P2<sup>-</sup>P3<sup>-</sup></i>	P1*T10G	15.4±11.1
<i>galP1(G-8T)P2<sup>-</sup>P3<sup>-</sup></i>	P1*G8T	10.8±6.9

**Table S7**

<i>Template</i>	<i>Name</i>	$K_d^{\text{act}}$ (nM), 4 <sup>o</sup> C
<i>galP1<sup>+</sup>P2<sup>-</sup></i>	P1-21	4.4±1.6
<i>galP1(G-14T,T-10G,G-8T)P2<sup>-</sup></i>	P1-21-TripleM	>38.5

**Table S8**

<i>Template</i>	<i>Name</i>	$K_d^{\text{act}}$ (nM), 0 <sup>o</sup> C
<i>galP1<sup>+</sup>P2<sup>-</sup>P3<sup>+</sup></i>	P1	0.87±0.2
<i>galP1(G-14T)P2<sup>-</sup>P3<sup>+</sup></i>	P1G14T	1.64±0.4
<i>galP1(T-10G)P2<sup>-</sup>P3<sup>+</sup></i>	P1T10G	2.4±0.8
<i>galP1(G-8T)P2<sup>-</sup>P3<sup>+</sup></i>	P1G8T	2.3±0.4

**Table S9**

<b>TEMPLATE</b>	<b>NAME</b>	<b><math>K_d^{\text{act}}</math> (nM), 4<sup>0</sup>C</b>
<b><math>P_R(\text{WT})</math></b>	PR	7.7±0.3
<b><math>P_R(\text{T-13G})</math></b>	PRT13G	15.5±2.4
<b><math>P_R(\text{G-12T})</math></b>	PRG12T	4.5±0.4
<b><math>P_R(\text{A-11C})</math></b>	PRA11C	6.0±1.7
<b><math>P_R(\text{T-10G})</math></b>	PRT10G	6.8±1.1
<b><math>P_R(\text{A-9C})</math></b>	PRA9C	6.3±0.9
<b><math>P_R(\text{A-8C})</math></b>	PRA8C	5.9±1.4
<b><math>P_R(\text{T-7C})</math></b>	PRT7C	7.0±1.6
<b><math>P_R(\text{G-12T,T-7C})</math></b>	PRMT7C	8.6±2.0
<b><math>P_R(\text{G-12T,A-11C})</math></b>	PRMA11C	10.2±3.9
<b><math>P_R(\text{G-12T,T-35C})</math></b>	PRMT35C	12.0±1.5

**Table S10**

<b>Template</b>	<b>Name</b>	<b>Q437A, <math>K_d^{\text{act}}</math> (nM), 4<sup>0</sup>C</b>
<b><math>galP1^+P2^-P3^+</math></b>	P1	0.76±0.1
<b><math>galP1(\text{G-8T})P2^-P3^+</math></b>	P1G8T	4.4±1.2
<b><math>galP1(\text{T-10G})P2^-P3^+</math></b>	P1T10G	9.4±3.4
<b><math>galP1(\text{G-14T})P2^-P3^+</math></b>	P1G14T	0.38±0.1
<b><math>galP1(\text{T-15G})P2^-P3^+</math></b>	P1T15G	0.94±0.1

**Table S11**

<b>Template</b>	<b>Name</b>	<b>R436A, <math>K_d^{act}</math> (nM), 4°C</b>
<i>galP1<sup>+</sup>P2<sup>-</sup>P3<sup>+</sup></i>	P1	1.35±0.1
<i>galP1(G-8T)P2<sup>-</sup>P3<sup>+</sup></i>	P1G8T	7.4±2.3
<i>galP1(T-10G)P2<sup>-</sup>P3<sup>+</sup></i>	P1T10G	6.4±2.1
<i>galP1(G-14T)P2<sup>-</sup>P3<sup>+</sup></i>	P1G14T	1.2±0.2
<i>galP1(T-15G)P2<sup>-</sup>P3<sup>+</sup></i>	P1T15G	2.6±0.7

Each binding constant presented in Tables S5-S11 is an average of at least 3 independent determinations. The uncertainty values are the SEM.