

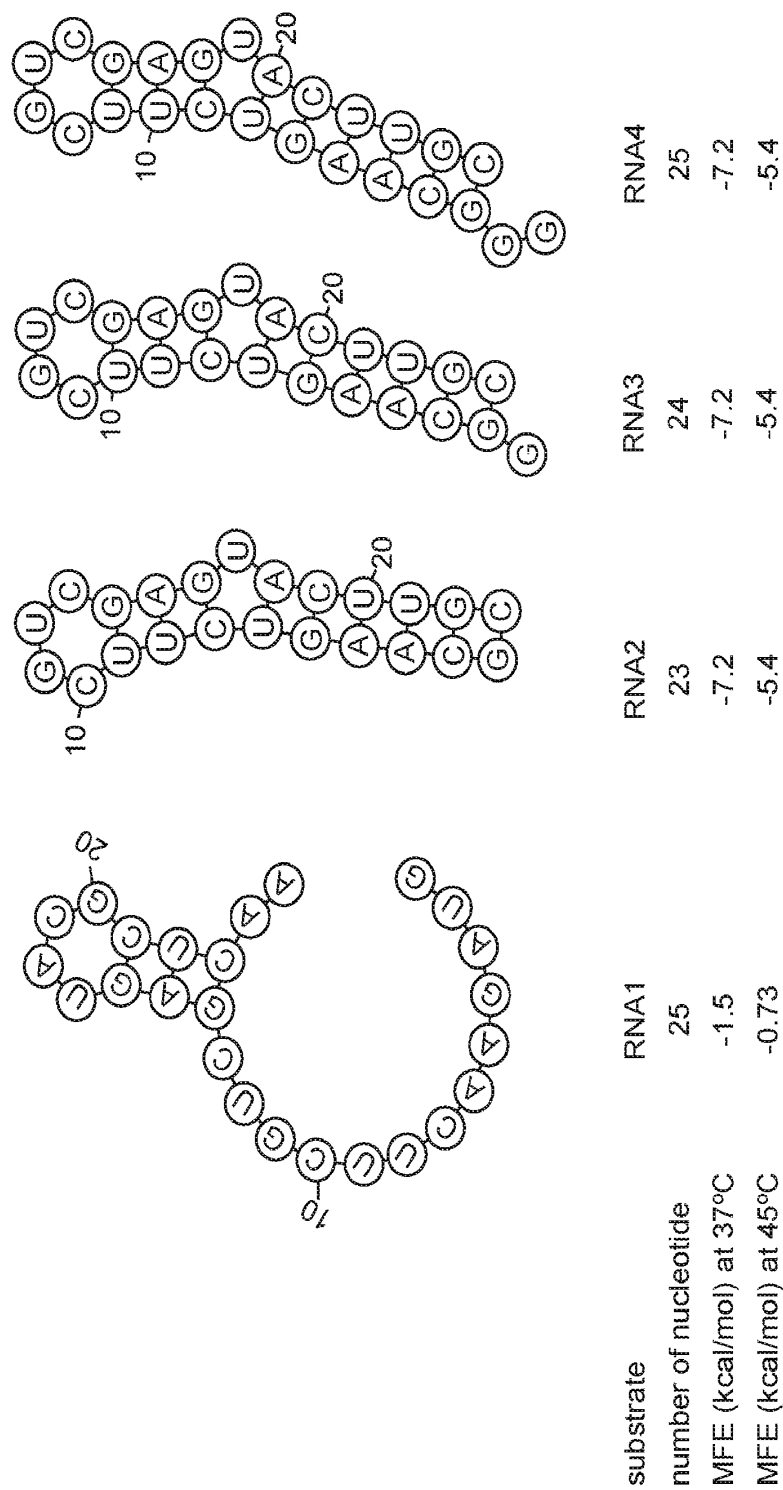


FIG. 1

2 / 24

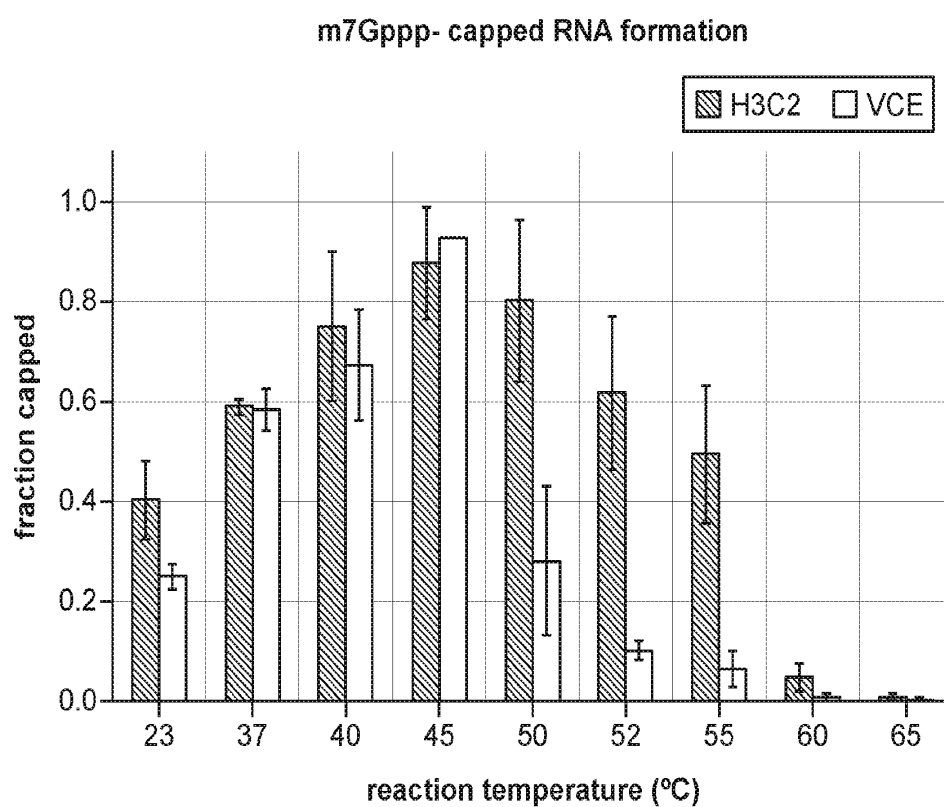


FIG. 2

3 / 24

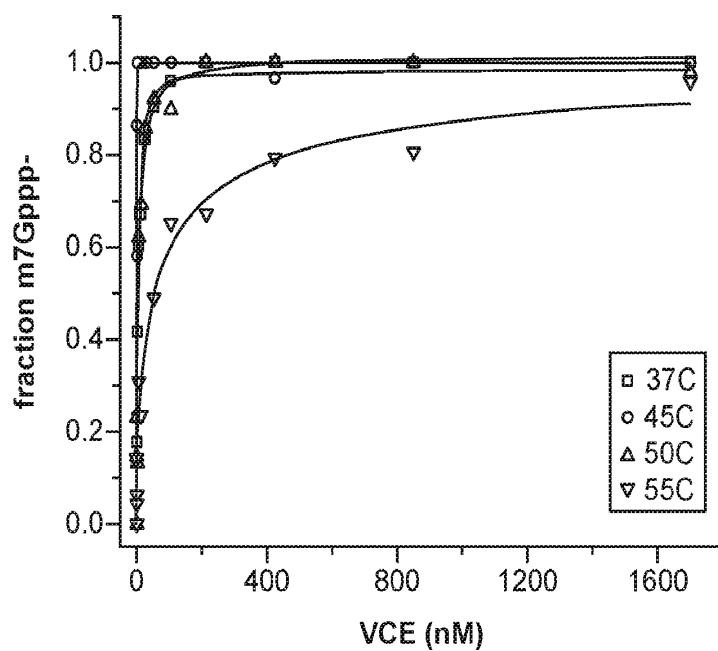


FIG. 3A

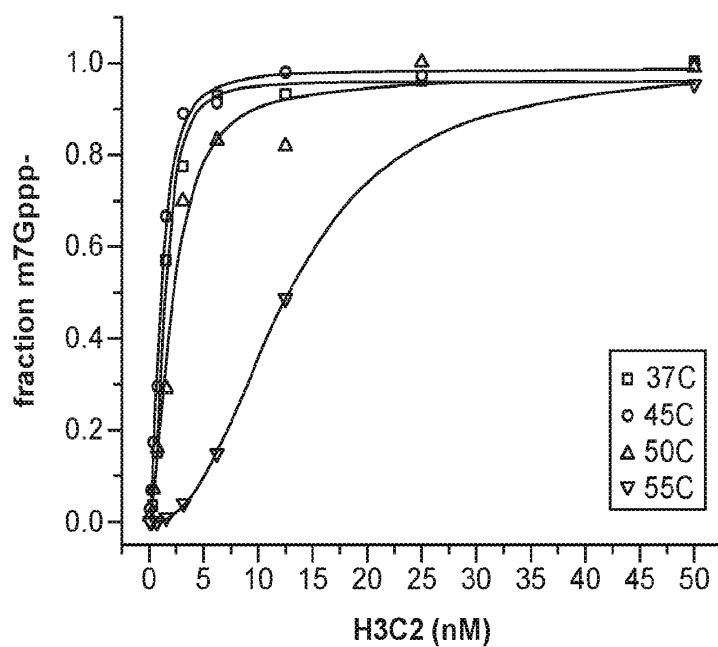


FIG. 3B

4 / 24

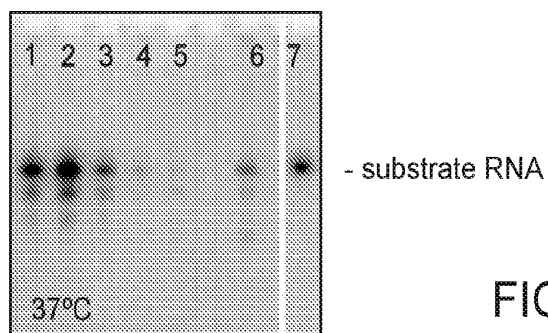


FIG. 4A

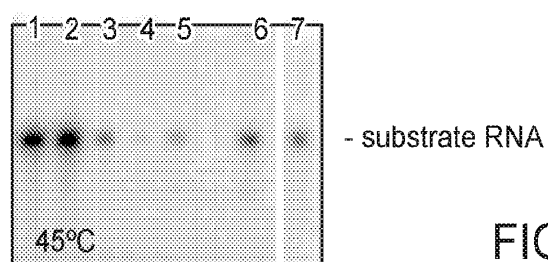


FIG. 4B

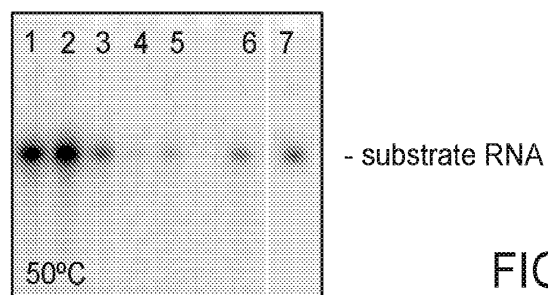


FIG. 4C

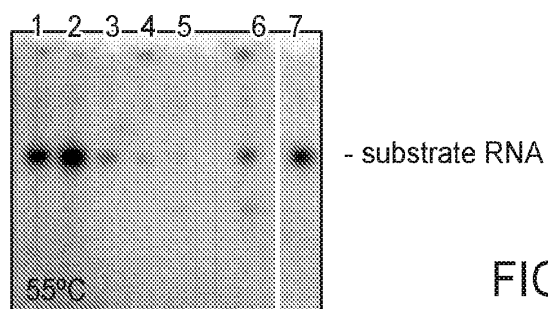


FIG. 4D

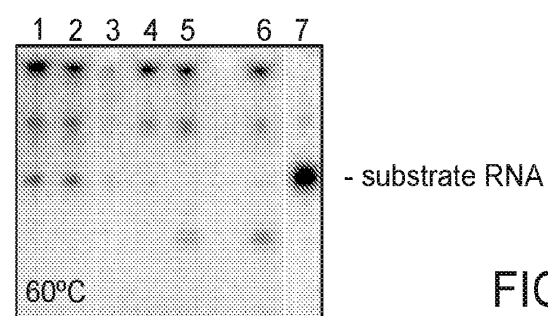


FIG. 4E

5 / 24

	10	20	30	40	50	60	70
AMN83561	....|....|....|....|....|....|....|....|	1					
AIB52055	-----MAKRLQRCQDVNQVCEIYNSKGGIGELELRFQKLQNLFAGVFDKLPDGEIQTTTMR	1					
SME65026	-----MRRVENSARKQQRCDQSVQVCEFYFNADNKTNELELRFQKLQNLFAGVFDKLPDGEIITTTMR	1					
SMH63629	-----MRRVENSARKQQRCDQSVQVCEFYFNADNKTNELELRFQKLQNLFAGVFDKLPDGEIITTTMR	1					
Fausto_CR_01	LEYQYKYIILVNIMSRRLQRCRDVDQVCEYYNAKGAIGELELRFQKLQNLFAGVFDKLPDGEIITTTMR	1					

	80	90	100	110	120	130	140
AMN83561	....|....|....|....|....|....|....|....|	58					
AIB52055	VSNPDGVAREITFGGGVKTNEIFVKKQNICVFDVVDVIFSYKVAVSSTEETVVEKPTMETTAGVRFKIRLSV	64					
SME65026	VSNADGMAREITFGGGVKTGEMFVKKQNICVFDVVDVIFSYKVAVSSEDEIKDKPKMDTNASVRFKIRLSC	64					
SMH63629	VSNADGMAREITFGGGVKTGEMFVKKQNICVFDVVDVIFSYKVAVSSEDEIKDKPKMDTNASVRFKIRLSC	71					
Fausto_CR_01	VSNSDGTAREITFGGGVKTGEMFVKKQNICVFDVVDVIFSYKVAVSSTEETLVDPKAMEKDVSVRFKIRMSV	16					

	150	160	170	180	190	200	210
AMN83561	....|....|....|....|....|....|....|....|	128					
AIB52055	EDVVKDWRIDLTAVKTAELGKIAQHTASIVQRTFFPDNLLKLTGAEVAKLAADSYEELEYTGKSPATNEK	134					
SME65026	DTLLIPDWRIDLTAVKVADLGKIAQHTSTVVLQTFPENLLRMKGAEVAAALATNSYELELEYIGKSAASKEK	134					
SMH63629	DTLLIPDWRIDLTAVKVADLGKIAQHTSTVVLQTFPENLLRMKGAEVAAALATNSYELELEYIGKSTAGKEK	141					

FIG. 5

6 / 24

AMN83561	220	230	240	250	260	270	280
AIB52055	204	204	204	211			
SME65026							
SMH63629							
	220	230	240	250	260	270	280
	198	198	198	198	198	198	198
	VNVA	YAV	ELL	SSVR	NAN	STAA	AFGES
	VDLC	RVAK	IHT	HEY	AN	VV	CRTP
	VF	SKML	LP	QV	VS	LT	KSSY
	VLAA	EYAME	LLT	NSR	NAI	SPAA	ATLGES
	VDIC	RIAK	LH	PAE	YAN	VICR	TPSF
	VF	SKML	LP	QV	VS	LT	KSSY
	VLKA	EYAI	ELL	TN	LRNA	VPVA	ATLGES
	VDIC	RIAK	LH	PAE	YAN	VICR	TPSF
	VF	SKML	LP	QV	VS	LT	KSSY
	VDAA	AKYAV	DLL	LAGI	KNAN	SAVG	AVLGES
	ISDI	CRVA	KVI	HTPD	YAT	VVCR	NPSP
	VF	SKML	LP	QV	VS	LT	KSSY
	290	300	310	320	330	340	350
	268	268	268	268	268	268	268
	YGGL	YP	PEN	WL	AG	KT	DG
	VR	AL	VV	CE	DG	VA	KVI
	TA	ES	VD	I	TH	GV	CS
	AT	IL	D	CE	LN	VD	
	AKILY						
	274	274	274	274	274	274	274
	YGGI	YP	PV	DM	YI	AG	KT
	DG	VR	AL	V	C	EN	GV
	AKI	I	T	AT	T	V	D
	PI	IL	D	CE	LN	VD	
	AKILY						
	274	274	274	274	274	274	274
	YGGI	YP	PV	DM	YI	AG	KT
	DG	VR	AL	V	C	EN	GV
	AKI	I	T	AT	T	V	D
	PI	IL	D	CE	LN	VD	
	AKILY						
	281	281	281	281	281	281	281
	YGGI	YP	PEG	M	V	AG	KT
	DG	VR	AL	V	C	EN	GV
	AKI	I	T	AT	T	V	D
	PI	IL	D	CE	LN	VD	
	AKILY						
	360	370	380	390	400	410	420
	331	331	331	331	331	331	331
	VFD	VI	IS	NT	QV	YT	Q
	P	F	STR	IT	TD	IS	DI
	KID	GY	KI	EM	KP	FF	V
	KV	K	--	AD	E	A	T
	F	K	S	A	Y	K	A
	P	H	N	E	G	L	I
	M	I	E				
	344	344	344	344	344	344	344
	IFD	VI	M	N	R	G	V
	H	S	H	R	E	G	F
	N	K	R	I	D	I	D
	LS	DL	T	P	A	G	Y
	T	L	E	L	K	P	F
	TK	L	V	D	A	A	S
	V	N	E	T	T	F	K
	S	V	F	K	P	P	H
	N	E	G	L	V	L	V
	344	344	344	344	344	344	344
	VFD	VI	M	N	R	G	V
	H	S	H	R	E	G	F
	N	K	R	I	D	I	D
	LS	DL	T	P	A	G	Y
	T	L	E	L	K	P	F
	TK	L	V	D	A	A	S
	V	N	E	T	T	F	K
	S	V	F	K	P	P	H
	N	E	G	L	V	L	V
	346	346	346	346	346	346	346
	VFD	I	I	M	N	S	K
	P	I	H	S	Q	P	F
	T	R	I	A	T	D	I
	S	D	V	K	I	P	E
	K	I	A	K	P	F	V
	K	I	Q	A	T	--	A
	L	E	A	A	F	K	E
	V	K	A	P	H	N	E
	G	L	I	L	I	M	
	430	440	450	460	470	480	490
	398	398	398	398	398	398	398
	DGA	Y	A	A	T	K	T
	K	Y	K	W	K	P	L
	S	H	N	T	I	D	F
	L	I	K	A	C	P	K
	Q	L	I	N	V	D	P
	P	K	P	R	A	G	Y
	K	L	W	L	L	F	T
	T	S	L	D	Q	Q	R
	E	L	G	I	E	F	I
	P	A	W				
	414	414	414	414	414	414	414
	SGP	P	Y	A	L	T	K
	T	K	Y	K	W	K	P
	I	T	H	N	T	I	D
	F	L	I	K	A	C	P
	K	Q	L	I	N	V	D
	P	F	K	P	R	N	G
	H	D	L	W	L	L	F
	T	S	L	D	Q	Q	R
	E	L	G	I	D	I	L
	P	A	W				
	414	414	414	414	414	414	414
	SGP	P	Y	A	L	T	K
	T	K	Y	K	W	K	P
	I	T	H	N	T	I	D
	F	L	I	K	A	C	P
	K	Q	L	I	N	V	D
	P	F	K	P	R	N	G
	H	D	L	W	L	L	F
	T	S	L	D	Q	Q	R
	E	L	G	I	D	I	L
	P	A	W				
	414	414	414	414	414	414	414
	DG	N	D	Y	A	M	T
	K	Y	K	W	K	P	L
	S	H	N	T	I	D	F
	L	I	K	A	C	P	K
	Q	L	I	N	V	D	P
	P	F	K	P	R	P	G
	H	D	L	W	L	L	F
	T	S	L	D	Q	Q	R
	E	L	G	I	E	F	I
	P	A	W				

FIG. 5 (Cont. 1)

7/24

AMN83561 500 510 520 530 540 550 560
|.....|.....|.....|.....|.....|.....|.....|.....|.....|
 468 ILFTDINMFSGSRVPIQFQPAINPLAXVCYLPEDVN-----VNDGDIVEMRAVDGYDTIPKWELVRSRND
 AIB52055 484 LLFTDVNLFGNKIPIQFQPAINPLAYICYLPSTG-----VNDGDIVEMRAVDGFDGPTWELVTRRPD
 SME65026 484 LLFTDVNLFGNKIPIQFQPAINPLAYICYLPSTG-----VNDGDIVEMRAVDGFDGPTWELVTRRPD
 SMH63629 484 MLFTDINLFGSRVPIQFQPAINPLAYICYLPEAATCANGDAINDGDIVEMRAVDGFDVTPKWEPIRVRS

AMN83561 532 RKNEPGFYGNKYKIASDIYLNIDVFHFDLWKYNPGYFEKNKSDIYVAPNKYRRMLIKSIEGRIYRDAK
 AIB52055 548 RKDERGFYGNKYKIASDIYLNIDVFNEFDLWKYNPGYFEKNKSDIYVAPNKYRRMLIKSIEGRIYRDAK
 SME65026 548 RKDERGFYGNKYKIASDIYLNIDVFNEFDLWKYNPGYFEKNKSDIYVAPNKYRRMLIKSIEGRIYRDAK
 SMH63629 554 RKDEPGFYGNKYKIASDIYLNIDVFQFEDLWKYNPGYFEKNKSDIYVAPNKYRRMLIKSIEGRIYRDAK
 Fausto_CR_03 1 -----GFYGNKYKIASDIYLNIDVFNEFDLWKYNPGYFEKNKSDIYVAPNKYRRMLIKSIEGRIYRDAK

AMN83561 602 WVIDAAAGRGADLHLYKAECEVENLLAIDIDPTAISSELVRRRNEITGYNKSHRGGR--NMHSHRGQSH---
 AIB52055 618 WVIDAAAGRGADLHLYKQECVENLLAIDIDPTAISSELVRRRNEITGYNKSHRGGR--NMHSHRGQSH---
 SME65026 618 WVIDAAAGRGADLHLYKQECVENLLAIDIDPTAISSELVRRRNEITGYNKSHRGGR--NMHSHRGQSH---
 SMH63629 624 WVIDAAAGRGADLHLYKAECEVENLLAIDIDPTAISSELVRRRNEITGYNKSHRGGR--NMHSHRGQSH---
 Fausto_CR_03 66 WVIDAAAGRGADLHLYKAECEVENLLAIDIDPTAISSELVRRRNEITGYNKSHRGGR--NMHSHRGQSH---

FIG. 5 (Cont. 2)

		710	720	730	740	750	760	770	
	MTase	.....	.....	.....	.....	.....	.....	.....	
AMN83561	666	--CAKSTSLHALVADLR	ENPDVLPKIIQSRPHERC	YDAIVNFAIHYLCDT	DEHIRDFLITVSRL	LAPN			
AIB52055	681	THCASSTSLHALVADLR	TEPNMLIPKIIQSRPP	PERGYDAIVNFAIHYLC	ETDDYIRNFLITVSRL	LAPD			
SME65026	685	THCASSTSLHALVADLR	TEPNMLIPKIIQSRPP	PERGYDAIVNFAIHYLC	ETDDYIRNFLITVSRL	LAHD			
SMH63629	694	QNCASSTTLHALVADLR	TPDVLIPKIIQSRPP	PERGYDAIVNFAIHYLC	DTDEHIRDFLITVSRL	LAPN			
	MTase	.....	.....	.....	.....	.....	.....	.....	
AMN83561	735	GVFIPTMDGESIVKLL	ADHKVRPGEAWTIH	TGD -VNSPDSTVP	KYSIRRLYDS	DKLTKTGQ	QIEVLL	LPM	
AIB52055	751	GVFIPTMDGEAIVNLL	AEHKVAPGASWVHT	DGNANATDANVV	KYSIKRLYDS	DKLTKTGQ	KIAVLL	LPM	
SME65026	755	GVFIPTMDGEAIVNLL	TEHKVAPGASWVHT	DGNATDANVV	KYSIKRLYDS	DKLTKTGQ	KIAVLL	LPM	
SMH63629	764	GIFMPTMDGESIVKLL	ETHKVKSGESWT	VHTG --ADDPEAGV	KYSIRRLYDS	DKLTKTGQ	QIAVLL	LPM	
Fausto_CR_05_1					KYSIKRLYDS	DKLTKTGQ	KIAVLL	LPM	
	MTase	.....	.....	.....	.....	.....	.....	.....	
AMN83561	804	SGEMKAEPLCN	IKNIISMARKMGLDL	VESANFSVL	YEAYARDYPDI	YARMT	PDDKLYNDL	LHTYAVFKRKK	
AIB52055	821	SGEMREEPLCN	IKNIISMARKMGLDL	VESANFSVL	YGAYAKDYPEI	YAKLT	PDDKLYND	LHAFVFKRKK	
SME65026	825	SGEMREEPLCN	IKNIISMARKMGLDL	VESANFSVL	YGAYAKDYPEI	YAKLT	PDDKLYNDL	HAFVFKRKK	
SMH63629	832	SGEMKTEPLCN	IKNIISMARKMGLDL	VESADFSVM	YDAFARAYPEI	SARLT	PDDKLYNDL	HSYAVFKRKK	
Fausto_CR_05_27		SGEMKREEPLCN	IKNIISMARKMGLDL	VESANFSV					

FIG. 5 (Cont. 3)

AAV50651 YP_007354410	1	1	10	20	30	40	50	60	70
									
			MGTKLKSSNDITIFSENEYNEIVEMLRDYSNGDNLEFEVSFKNINYPNFMRITEHYINITPENKIESNN						
			MVTNKK-SENIRDILGSDNVSrVEEMINFRKRNTEFEISVRKINYSNYRISYYVNTS--SDIQQVT						
			1	2	3	4	5	6	7
			8	9	10	11	12	13	14
									
AAV50651 YP_007354410	71	68	80	90	100	110	120	130	140
									
			YLDISLIFPDKNVYRVSLFNQEQIGEFITKFSKASSNDISRYIVSLDPSDDIEIVYKNRSGSKLIGIDNW						
			SIDISIILEDGNTYRVSVFLNENLINDFLSKYSNMKYGDIVKYILALNPNDDEIIYKKNRGSADRLSIEDL						
			1	2	3	4	5	6	7
			8	9	10	11	12	13	14
									
AAV50651 YP_007354410	141	138	150	160	170	180	190	200	210
									
			AITIKSTEEIPLVAGKSKISKPKITGSEIRIMRYKTRYSETINKNSRIDITDVKSSPIIWKLMTVPSNYE						
			NLVVKLTTEEVEVLN--NTTKPKLSGREKILYRYKNRYSFIIDITRIDITDVKETPNIWELSRKISNYE						
			1	2	3	4	5	6	7
			8	9	10	11	12	13	14
									
AAV50651 YP_007354410	211	205	220	230	240	250	260	270	280
									
			LELELIN-KIDINTLESELLNVFMI IQDTKIPISKAESDVTWEEYRNLLNVQRQNNLDSRNVISVNSNHI						
			TELEFTNNKIKSNQVFEKIFDILLRIVQNTTEIPIGIRESKQVITDYQNLLNLRSSNHLDSRNVSIEHQHI						
			1	2	3	4	5	6	7
			8	9	10	11	12	13	14
									
AAV50651 YP_007354410	280	275	290	300	310	320	330	340	350
									
			INFIPNRYAVTDKADGERYFLFSLNSGIYLLSINLTVKKLNIPVLEKRYQNMLIDGEYIKTTGHDLFMVF						
			VKFVFNRYAITDKADGERYFLFSTPNGVYLLSTNLTVKKNIPVLQKDFQNNMLLDGELIDIDGKELFMVF						
			1	2	3	4	5	6	7
			8	9	10	11	12	13	14
									

FIG. 6

10 / 24

AAV50651 YP_007354410	350 345	----- GTase -----									
		360	370	380	390	400	410	420			
											
		DVIFAEGTDYRYDNTYSLPKRIIIINNIIDKCFGNLIPFNDYTDKHNNELDISIKTYKSELSNYWKNEK									
		DVVYHNGIDYRYDNTYTLTHRIIIINDIDKAFNNLIPFTDYTDKNNNELDKIKEFYSNEIKTYWKNEFS									
AAV50651 YP_007354410	420 415	----- GTase -----									
		430	440	450	460	470	480	490			
											
		NRLNKSTDLFITRKLVLVPYGIDSSSEIFMYADMIMWKLIVYNELTPYQLDGIIYTPINSPYLIRGGIDAYD									
		KKLKNSGLFISRKLYFVPYGIDSSSEVFMYADLVWKLVCVDQLTPYKLDGIIYTPIASPYMIKTSANEID									
AAV50651 YP_007354410	490 485	-----									
		500	510	520	530	540	550	560			
											
		TIPMEYKWKPPSQNSIDFYIRFKKDVSGADAVYYDNSVERAEGPKYKICLLYVGLNKGQGEIPIQFKVNG									
		SVPMEYKWKPPSQNSIDFYVKEKDARGNEAIYYDNAVRGEGRPYKVCGLVGLNKGGEKPIAFKVAG									
AAV50651 YP_007354410 mounou_CR_03	560 555 1	-----									
		570	580	590	600	610	620	630			
											
		VEQTANIYTKDGEATDINGNALINDNTVVEFEDTLKIDMDDSYKWIPIRTRYDKTESVQKYHKHYGNNILQ									
		VEQKAFIYLINDEALDLSGNVINDNTVVEFEDFNFKIDMDDPEYKWIPIRTRYDKTESVQKYRKKYGNLIH									
		----- ----- ----- ----- ----- ----- ----- ----- ----- -----									
		INDNTVVEFEDFNFKIDMDDPEYKWIPIRTRYDKTESVQKYHKHYGNNLIH									
AAV50651 YP_007354410 mounou_CR_03 mounou_CR_04	630 625 50 1	----- MTase -----									
		640	650	660	670	680	690	700			
											
		IANRIWKTIITNPFTEBIIISLGDPTTFNKETITLLSDFRDTKYNKQALTYQKNTSNAAGMRAFNNEIKSN									
		IATRIRWETITNEVTEBIIAALGNASTFEKEMSKLVKNES-YNKQSFSSYYQKNTSNAIGMRAFNNEIKSN									
		IANRIWKTIITNPFTEBII-----|-----|-----|-----|-----|-----|-----|-----|									
		----- ----- ----- ----- ----- ----- ----- ----- ----- -----									
		YYQKNTSNAAGMRAFNNEIKSN									

FIG. 6 (Cont. 1)

11 / 24

AAV50651 YP_007354410 motmou_CR_04_23	700 694 23	710 720 730 740 750 760 770	MTase	710 720 730 740 750 760 770	MTase	710 720 730 740 750 760 770
AAV50651 YP_007354410 motmou_CR_04_93	770 764 93	780 790 800 810 820 830 840	MTase	780 790 800 810 820 830 840	MTase	780 790 800 810 820 830 840
AAV50651 YP_007354410	839 834	850 860 870 880 890 900 910	MTase	850 860 870 880 890 900 910	MTase	850 860 870 880 890 900 910
AAV50651 YP_007354410	909 904	920 930 940 950 960 970 980	MTase	920 930 940 950 960 970 980	MTase	920 930 940 950 960 970 980
AAV50651 YP_007354410	979 974	990 1000 1010 1020 1030 1040 1050	MTase	990 1000 1010 1020 1030 1040 1050	MTase	990 1000 1010 1020 1030 1040 1050
AAV50651 YP_007354410	1049 1044	1060 1070 1080 1090 1100 1110 1120	MTase	1060 1070 1080 1090 1100 1110 1120	MTase	1060 1070 1080 1090 1100 1110 1120
AAV50651 YP_007354410	1119 1114	1130 1140 1150 1160 1170	MTase	1130 1140 1150 1160 1170	MTase	1130 1140 1150 1160 1170

FIG. 6 (Cont. 2)

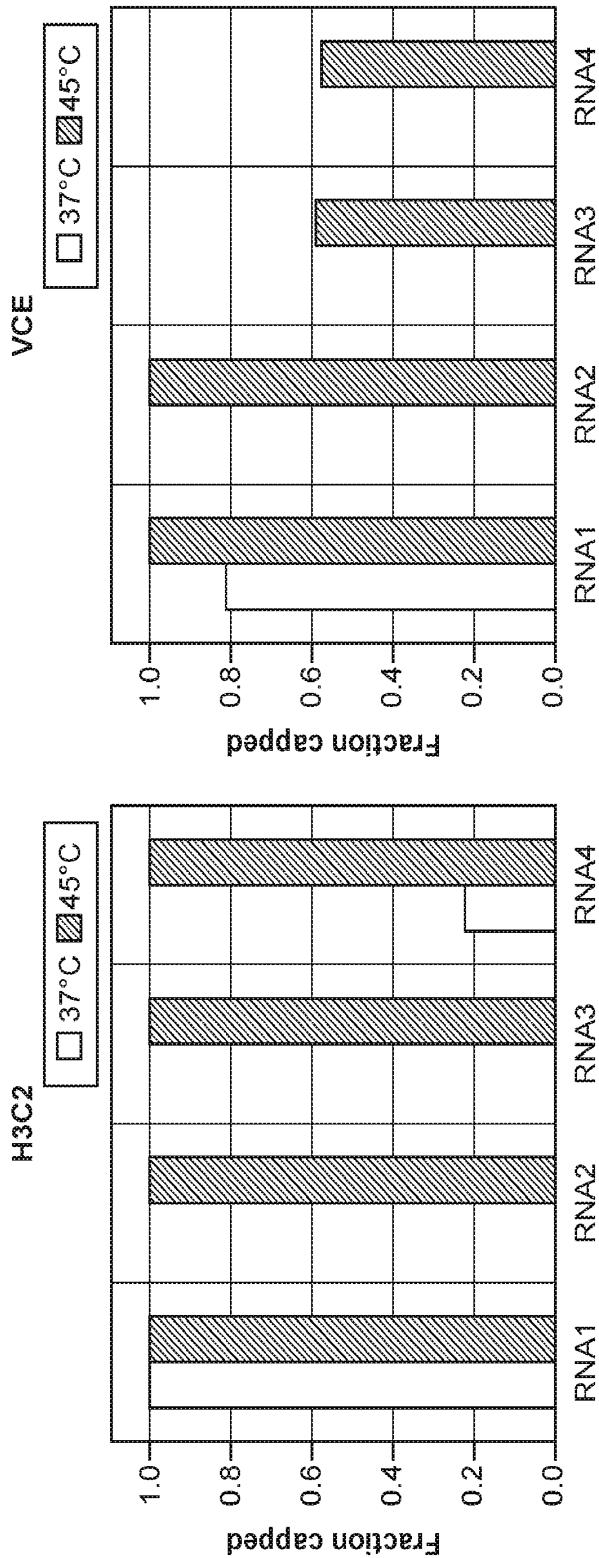


FIG. 7

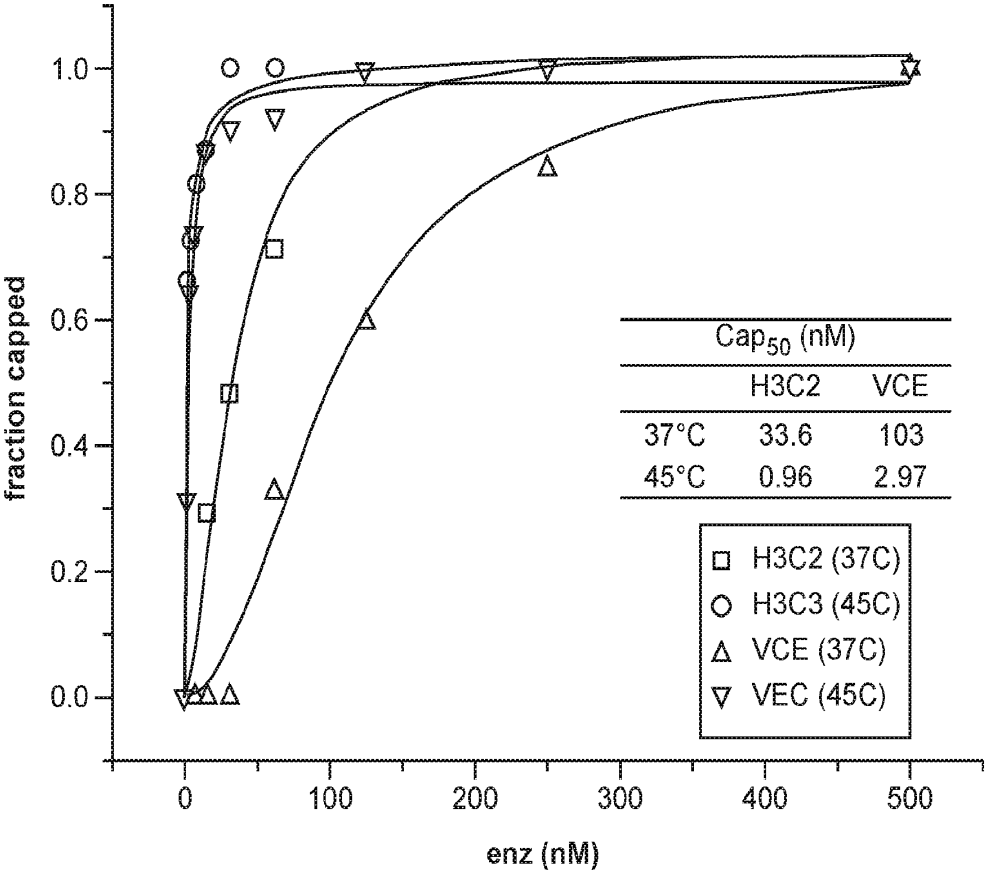


FIG. 8

14 / 24

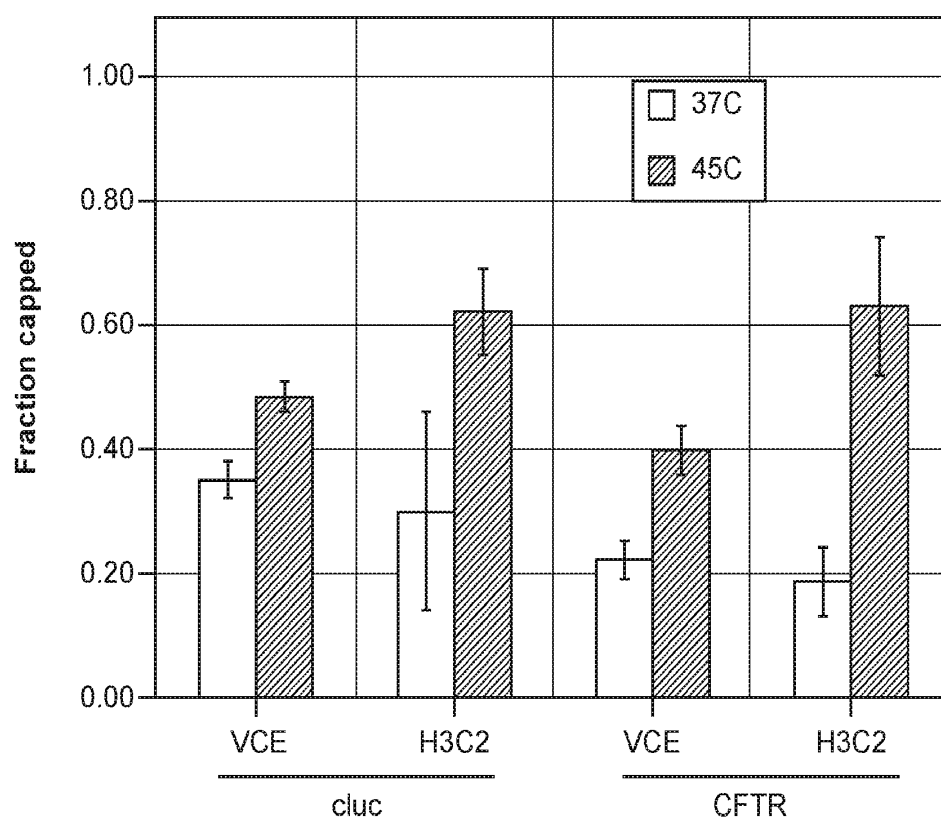


FIG. 9

15 / 24

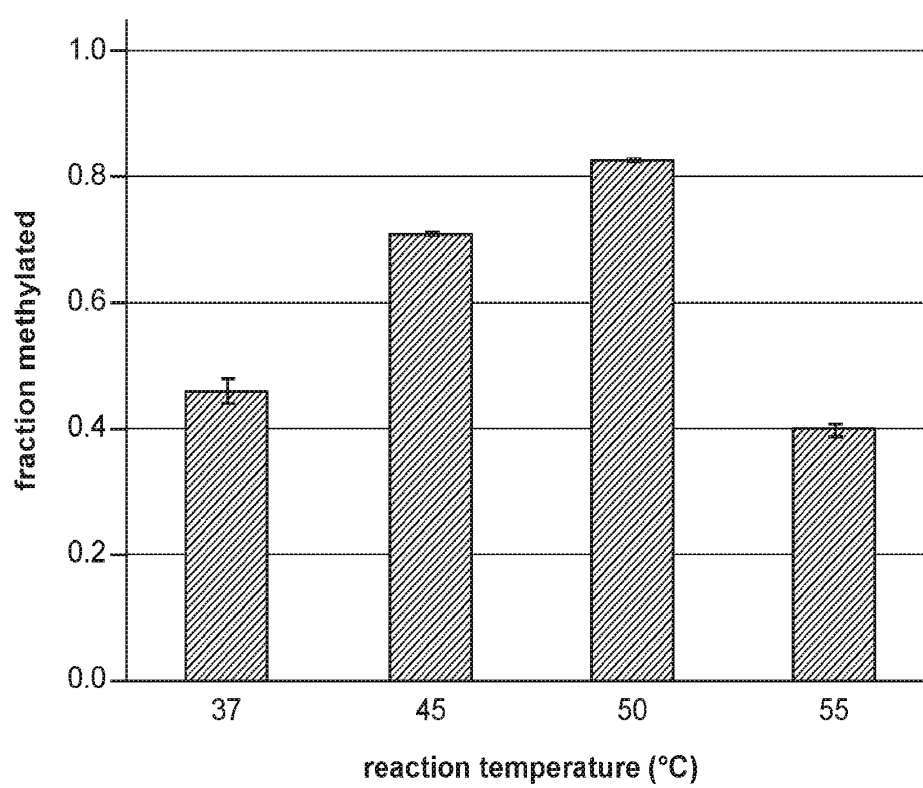


FIG. 10

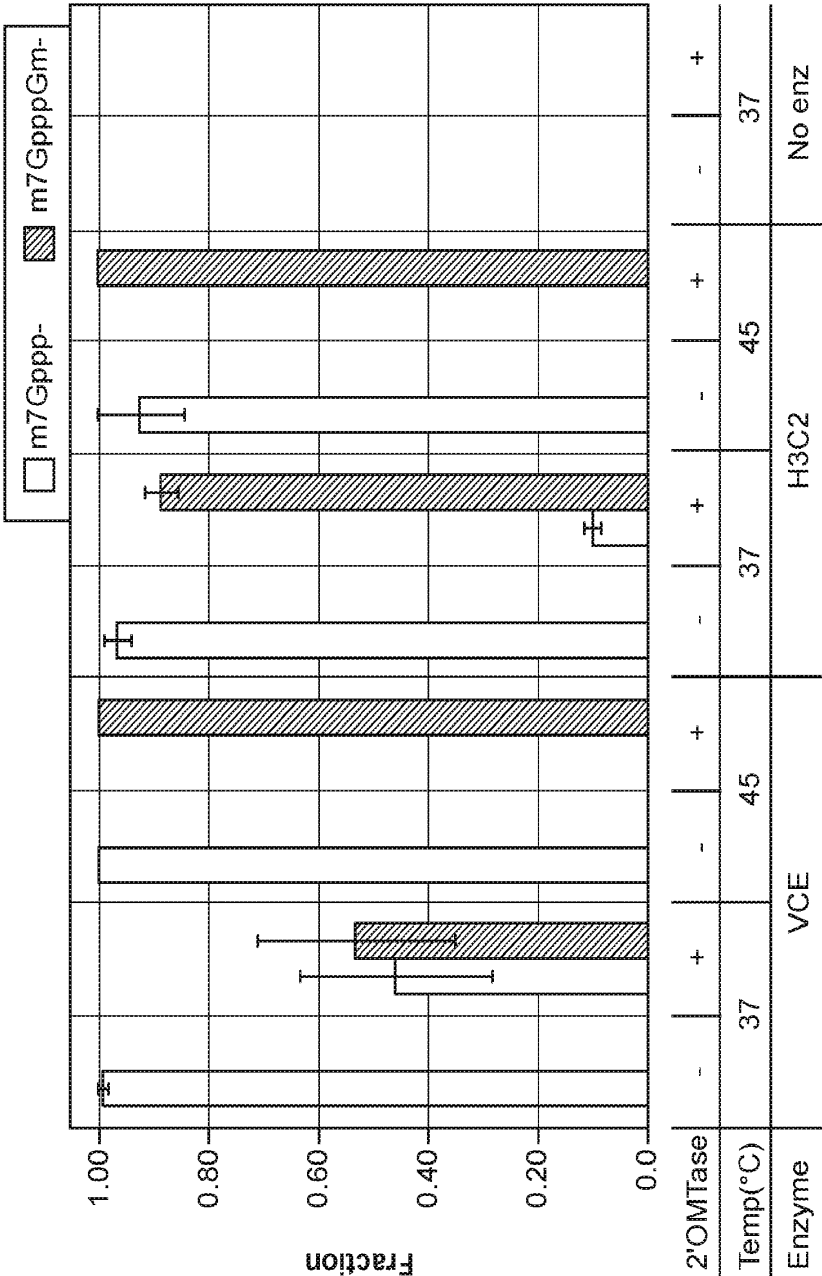
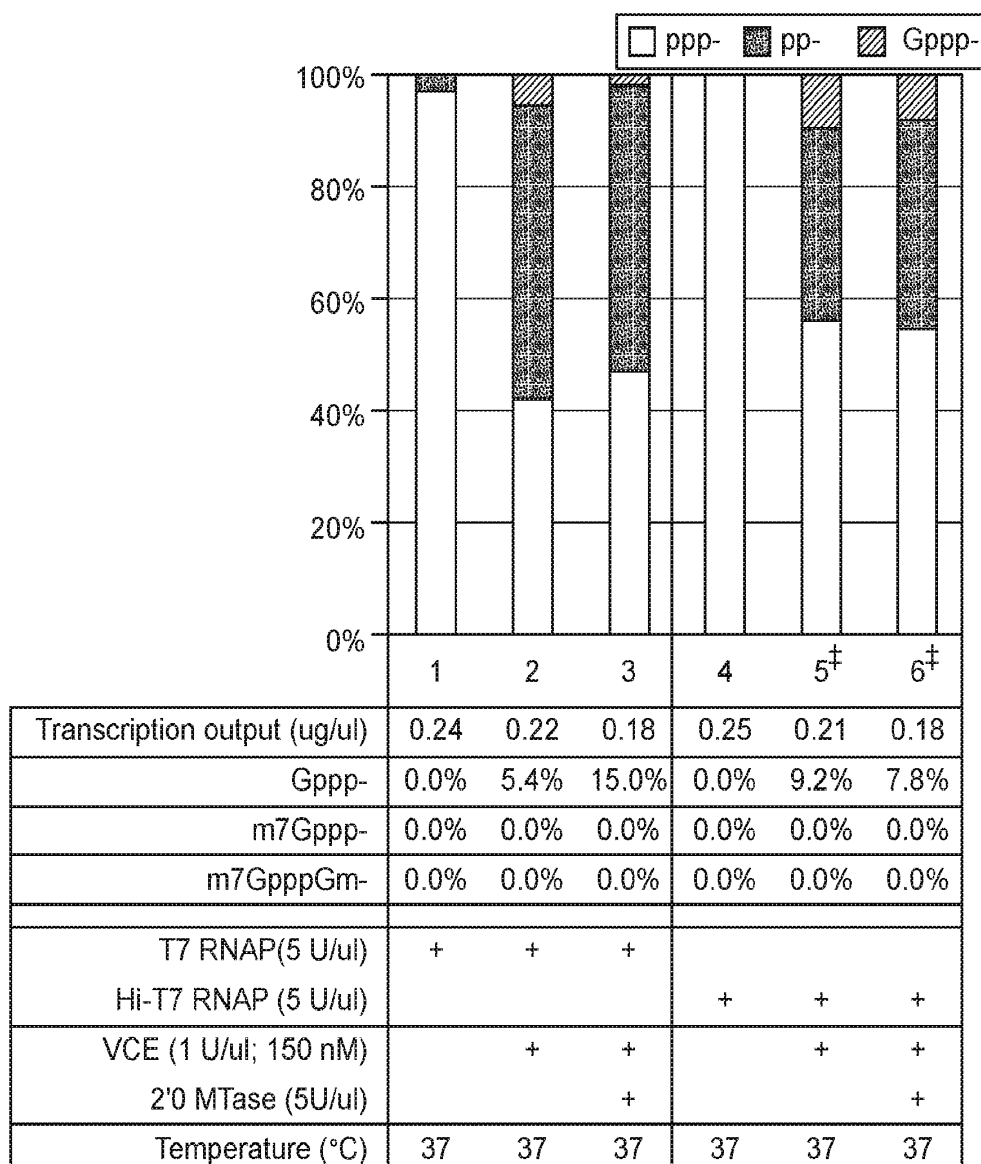


FIG. 11

17 / 24



n = 3 unless stated otherwise

[†]n = 2

FIG. 12

18 / 24

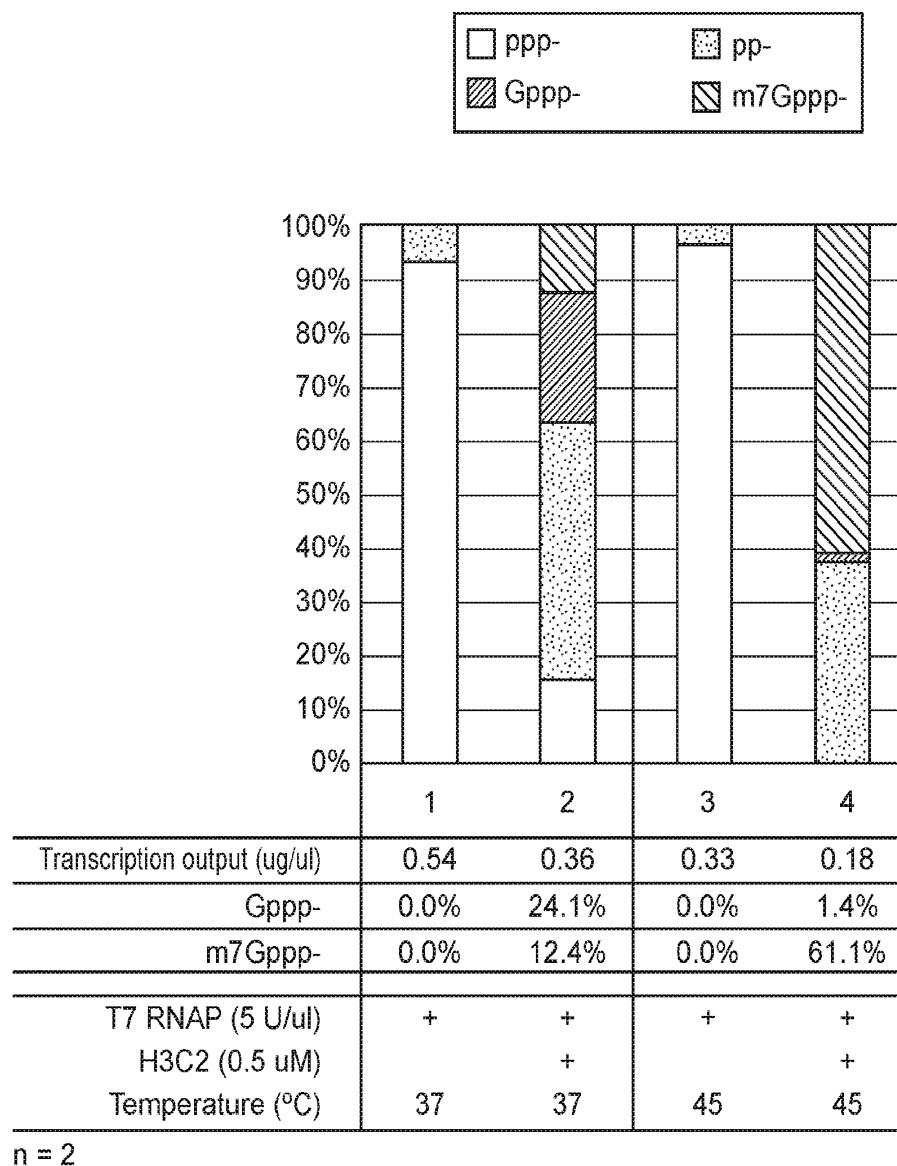


FIG. 13

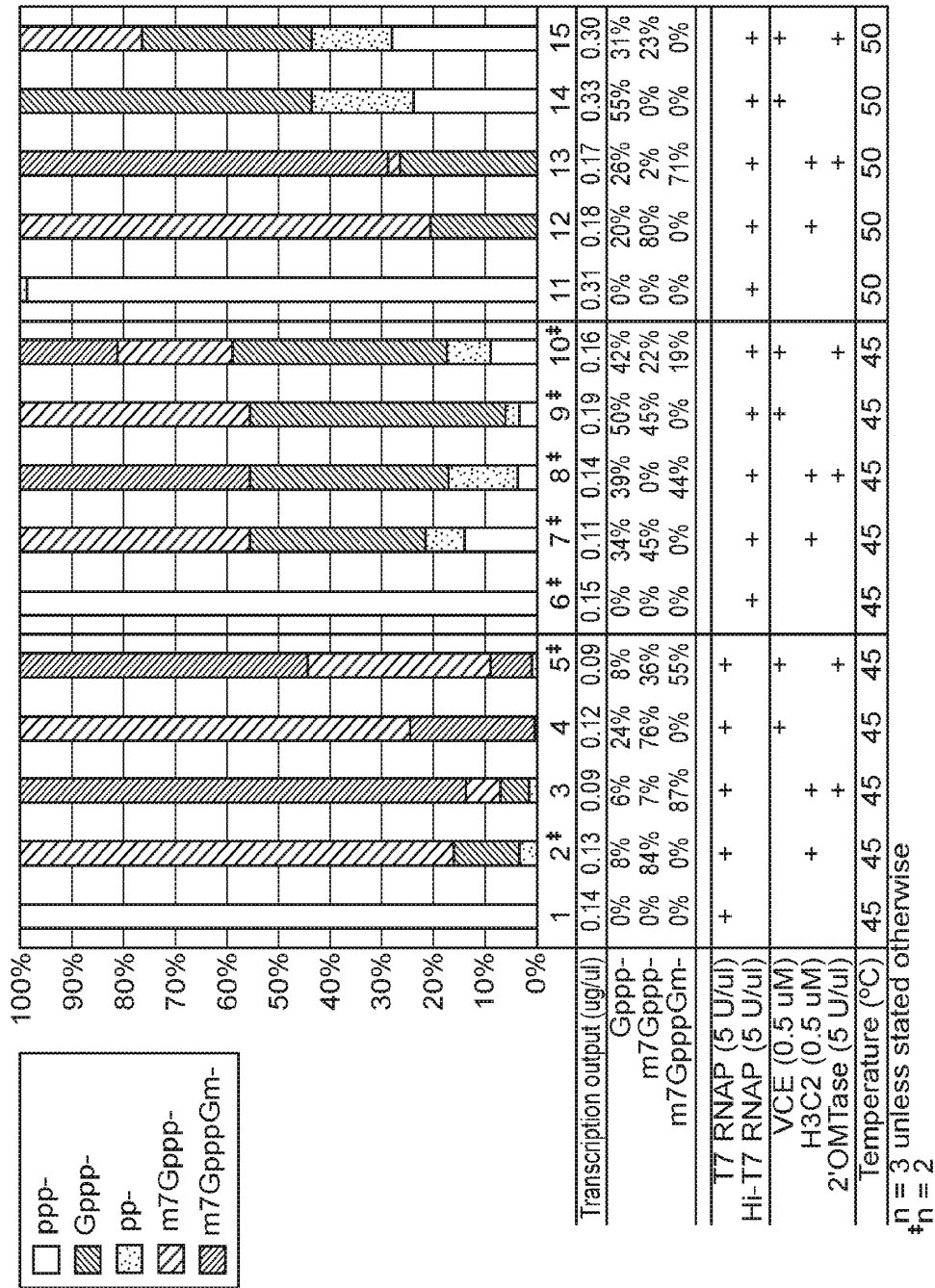
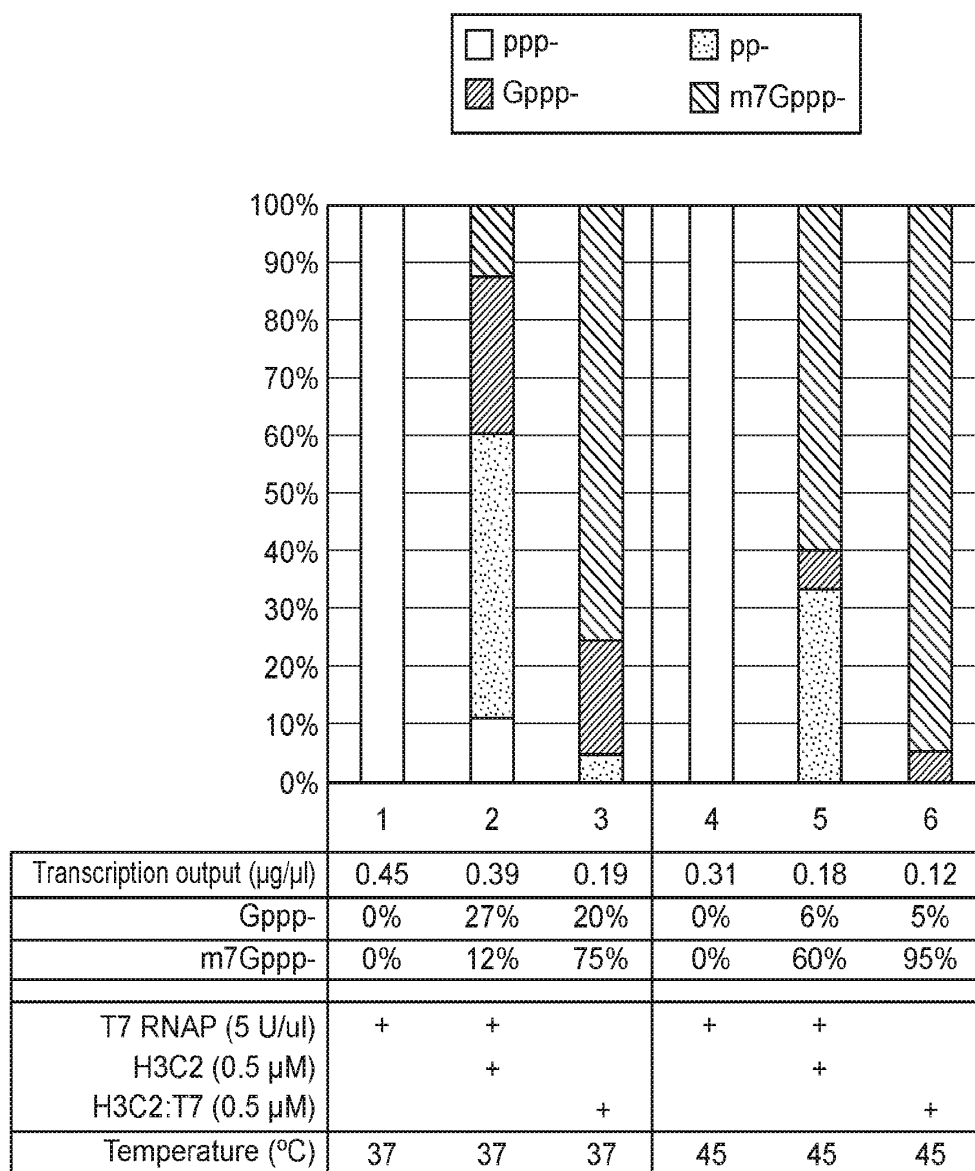


FIG. 14

20 / 24



n = 2

FIG. 15

21 / 24

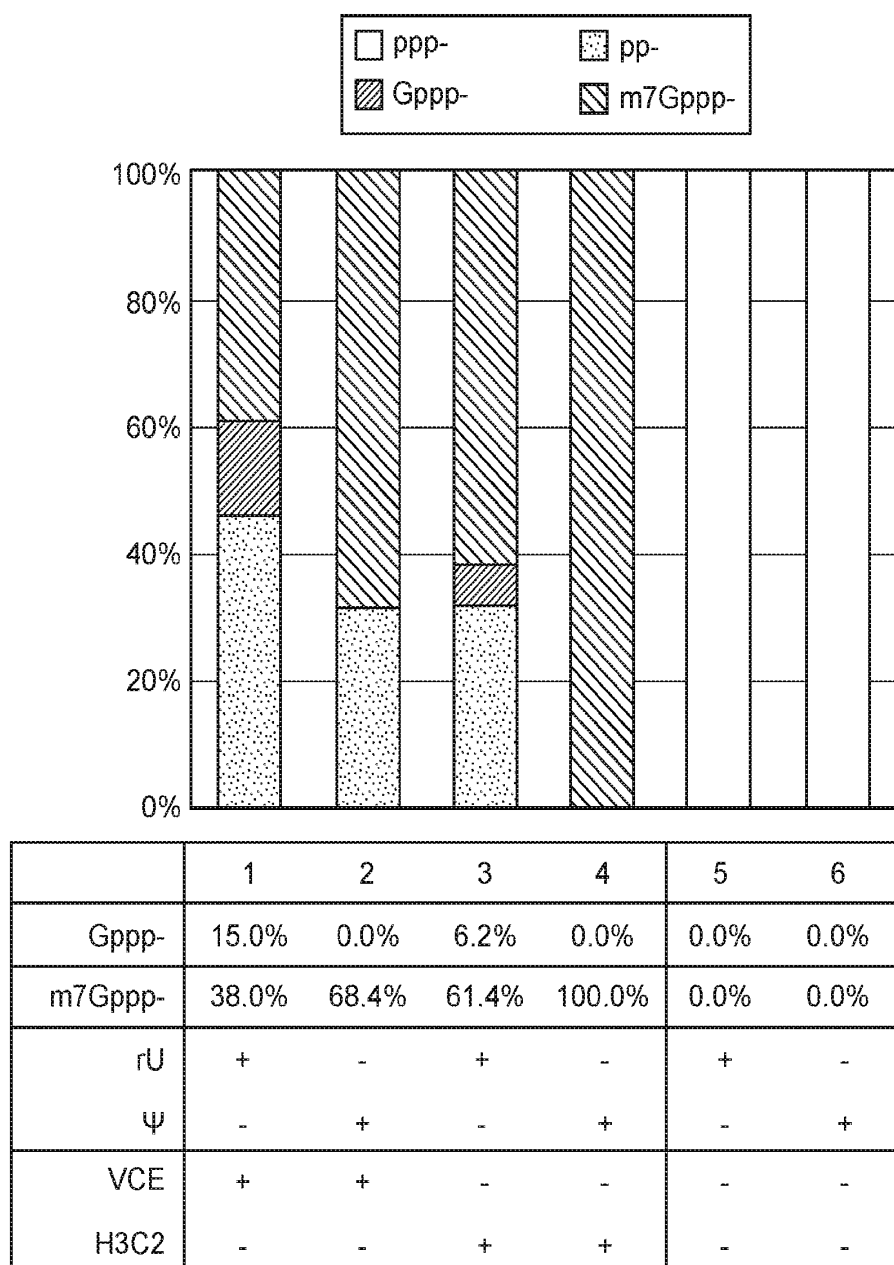


FIG. 16

22 / 24

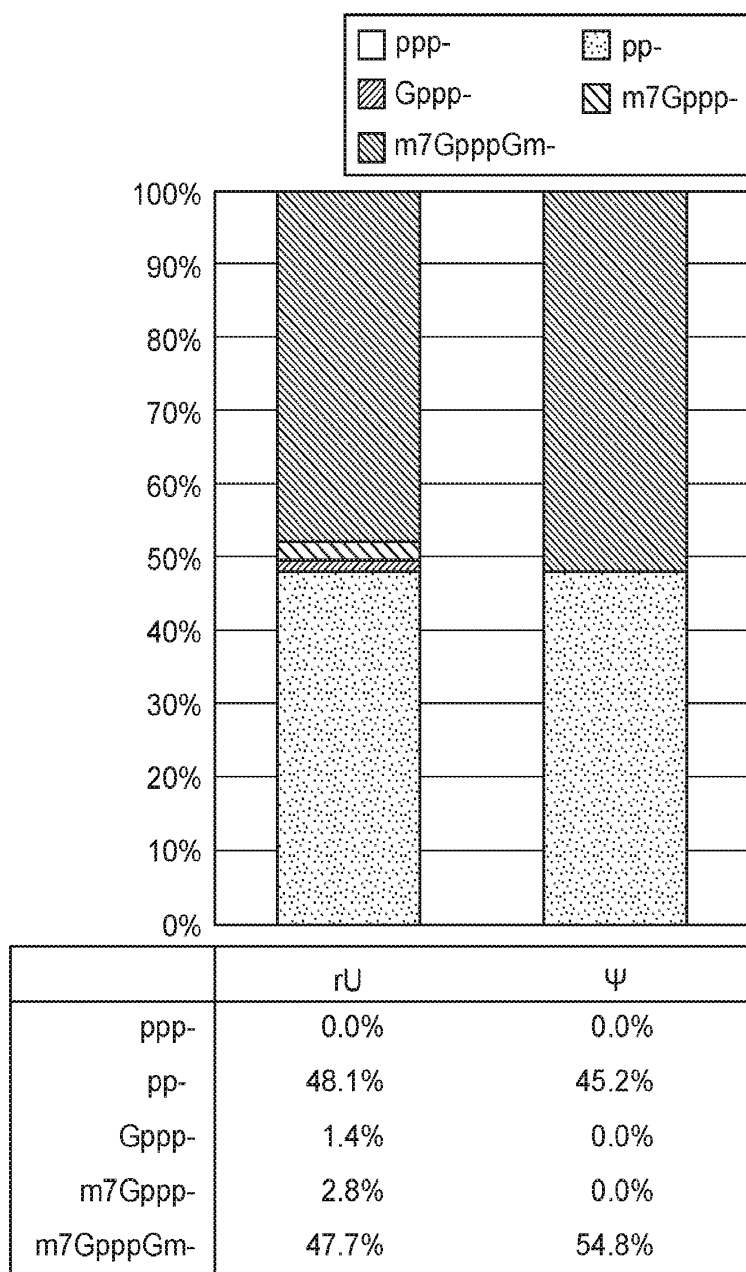


FIG. 17

23 / 24

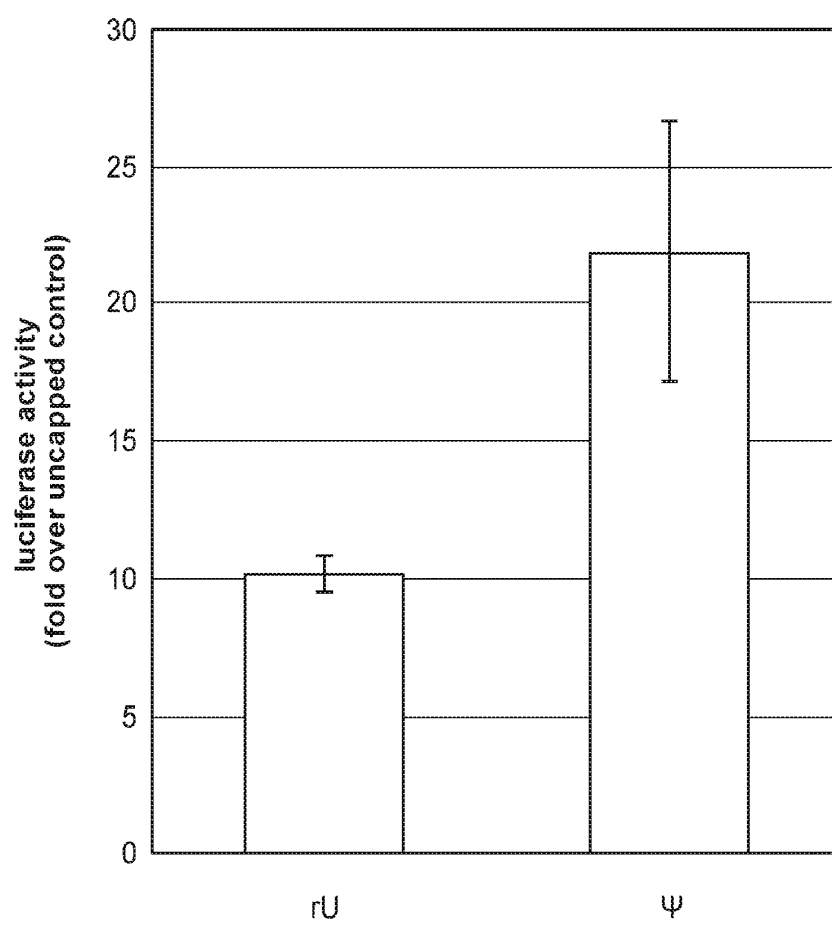
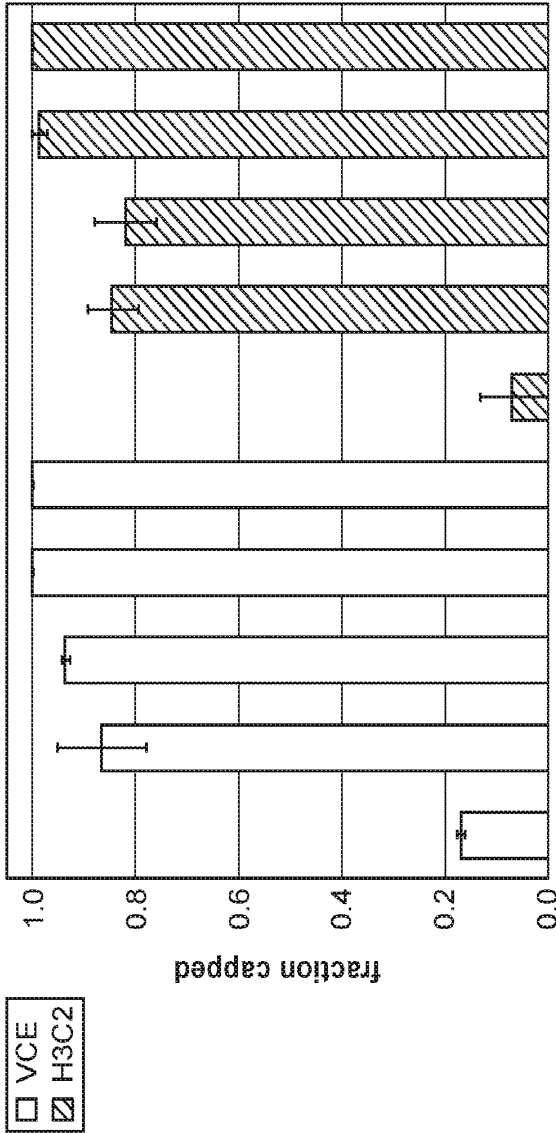


FIG. 18



Temperature (°C)	0 - 30 min		37	37	37	37	37	37	37	37	37	37	
	31 - 60 min		28	32	37	45	50	28	32	37	45	50	
Transcription output (ug/ul)			1.10	2.29	2.61	2.72	0.81	1.05	1.50	2.60	3.32	0.79	
Intact mass spec	Gppp-		17.0%			33.5%			19.8%				10.7%
	m7Gppp-		81.9%			64.7%			72.6%				88.6%
T7 RNAP(5 U/ul)			+	+	+	+	+	+	+	+	+	+	
VCE (500 nM)			+	+	+	+	+	-	-	-	-	-	
H3C2 (500 nM)			-	-	-	-	-	+	+	+	+	+	

FIG. 19