### **Supporting Information S1**

#### Tpz1-Ccq1 and Tpz1-Poz1 interactions within fission yeast shelterin modulate Ccq1 Thr93 phosphorylation and telomerase recruitment

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## Characterization of fission yeast shelterin

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**Figure S1.** Y2H mutational analysis of charged residues within Tpz1-Ccq1 and Tpz1-Poz1 interaction domains.

(A) Sequence alignment of Tpz1 regions responsible for Tpz1-Ccq1 and Tpz1-Poz1 interaction in *S. pombe* and corresponding regions from three additional *Schizosaccharomyces* species (*S. octosporus*, *S. cryophilus* and *S. japonicus*). Conserved charged amino acids mutated for Y2H analysis are indicated. Blue diamonds indicate various truncation mutants of Tpz1. (See Figure 1C.) (B) Y2H assay for mutations that did not affect Tpz1-Ccq1 or Tpz1-Poz1 interaction. Indicated mutations were tested in full length Tpz1 (Tpz1-FL). For charged residues (Lys, Arg, Asp and Glu), either a charge swap (Lys/Arg to Glu) or an Alanine mutation (Lys/Arg/Asp/Glu to Ala) was introduced. Positive interactions were identified by growth on –His –Ade and –His +5mM 3AT plates.



**Figure S2.** Y2H analysis of hydrophobic to alanine mutations within Tpz1-Ccq1 and Tpz1-Poz1 interaction domains.

(A) A schematic representation of Tpz1, marked with Ccq1 and Poz1 interaction domains. (B) Y2H assay for alanine mutations of conserved hydrophobic residues within Tpz1-Ccq1 or Tpz1-Poz1 interaction domains. Indicated mutations were tested in full length Tpz1 (Tpz1-FL). Positive interactions were identified by growth on –His –Ade and –His +5mM 3AT plates. (C) Y2H assay comparison of Ccq1-Tpz1 interaction for wild-type (wt) Tpz1, Tpz1-L449R and Tpz1-L449A. 5-fold serial dilution series were spotted on indicated plates. For all selection plates tested, L449A showed a milder defect on Tpz1-Ccq1 Y2H interaction than L449R.



Figure S3. Comparison of *tpz1-L449R* and *tpz1-L449A* mutant alleles.

(A) Examination of Tpz1-Ccq1 interaction by co-IP in less stringent (60 mM NaCl) or our standard (150 mM NaCl) lysis/wash conditions. We found that L449R and L449A are equally effective in disrupting Tpz1-Ccq1 interaction detected in co-IP experiments. (B) Southern blot analysis of telomere length for tpz1-L449A cells. Haploid cells were generated by dissection of spores derived from heterozygous  $tpz1^{+}/mutated tpz1$  diploid cells, and restreaked twice or 5 times on plates (estimated to be 40-50 or 100-125 cell divisions, respectively) prior to preparation of genomic DNA. For each round of restreak, several faster growing colonies were combined and streaked for single colonies on YES plates. (C) Pulsed-field gel analysis of telomere fusions for early generation small colonies of tpz1-L449A cells, which showed I+L fusion band as well as much fainter bands for I+M, L+M, I, L and M bands for two out of four clones tested. (See Figure 4B for a Notl-restriction site map of fission yeast chromosomes.) Compared to the tpz1-L449R mutant shown in Figure 4B, tpz1-L449A showed less prominent early telomere fusions. (D-E) Epistasis analysis for telomere loss by Southern blot (D) or telomere fusion by pulsed-field gel (E) indicated that both L449A and L449R alleles show synergistic telomere loss and fusion phenotypes in  $poz1\Delta$  cells. Samples were prepared from early generation cells after strains were generated by genetic cross of parental haploid strains and dissection of resulting double mutant spores.



Figure S4. Effects of Tpz1-Ccq1 interaction disruption mutations on telomere maintenance.

Southern blot analysis of telomere length for indicated Tpz1-Ccq1 interaction disruption mutants. Multiple independent haploid cells were generated by dissection of spores derived from heterozygous  $tpz1^+$ /mutated tpz1 diploid cells, and restreaked 11 times (estimated to be 220-275 cell divisions) on plates prior to preparation of genomic DNA. For each round of restreak, several faster growing colonies were combined and streaked for single colonies on YES plates.



**Figure S5.** Liquid culture growth assay and Southern blot telomere analysis of Tpz1-Ccq1 interaction disruption mutant L449R.

Wild-type (wt) (**A**),  $trt1\Delta$  (**B**),  $ccq1\Delta$  (**C**) and tpz1-L449R (**D**) haploid colonies (freshly derived by dissection of spores derived from heterozygous diploid cells) were inoculated and subsequently serially diluted to  $4x10^4$  cells/ml every 24 hours in fresh YES. Cell densities were counted after 24 hours and plotted (left panels). For Southern blot analysis (right panels), cells from two cultures for each genotype were harvested and genomic DNA was prepared for days indicated.



Figure S6. Tpz1-Ccq1 interaction is necessary to prevent checkpoint activation.

(A) Microscopic analysis of early generation (20-40 cell divisions) wild-type (wt), *ccq1* $\Delta$  and *tpz1*-mutant cells grown in liquid YES culture. White scale bar indicates 10  $\mu$ m. (B) Western blot analysis of whole cell extracts from wild-type, *ccq1* $\Delta$  and *tpz1*-mutant cells expressing Chk1-myc. Wild-type cells were also exposed to 100 Gy of gamma-irradiation to induce DNA damage and Chk1 phosphorylation (\*).





Wild-type,  $ccq1\Delta$ ,  $poz1\Delta$  and tpz1-mutant cells carrying the  $his3^+$  marker gene directly adjacent to the chromosome 1L telomere repeats were serially diluted and spotted on YES (no selection) or PMG ULA (-histidine) plates. (A) Similar to  $ccq1\Delta$ , all Tpz1-Ccq1 interaction disruption mutations caused loss of transcriptional silencing at telomeres. (B) Similar to  $poz1\Delta$ , all Tpz1-Poz1 interaction disruption mutations caused loss of transcriptional silencing at telomeres.



Figure S8. Characterization of Tpz1-Ccq1 interaction disruption mutant cells.

(A-C) Southern blot analysis of early generation mutant strains (20-40 cell divisions) utilized in ChIP analysis (Figure 5). (D) Binding of Tpz1 to telomerase RNA (*TER1*) was lost in Tpz1-Ccq1 interaction disruption mutants. Error bars indicate standard error of the mean from three to four independent experiments. Statistical analysis of *TER1* co-IP data by 2-tailed Student's t-test is shown in Table S5. Expression of Tpz1 was examined by anti-myc western blot, and Cdc2 served as loading control.



**Figure S9.** Comparison of *tpz1-L449A* and *tpz1-L449R* alleles for their effects on Ccq1 and Trt1<sup>TERT</sup> localization to telomeres.

(A) Based on ChIP assay, Ccq1 showed comparable reduction in telomere association for both L449A and L449R alleles. (B) Comparable loss of Trt1 binding to telomeres was observed by ChIP assay for  $ccq1\Delta$ , tpz1-L449A and tpz1-L449R cells. In contrast to these mutant cells that show telomere shortening due to loss of telomerase recruitment, catalytically dead Trt1 (trt1-D743A) showed increased binding at shorter telomeres [36]. Error bars represent standard error of the mean from three to eight independent experiments. Statistical analysis of ChIP data by 2-tailed Student's t-test is shown in Table S5.





(A) A schematic overview of Tpz1 truncation mutants. Minimum Ccq1 and Poz1 interaction domains are indicated. (B) Anti-myc western blot analysis to detect expression levels of myc-tagged wild-type and *tpz1*-truncation mutants in whole cell extract. Cdc2 served as loading control. (C) Southern blot analysis of wild-type and indicated truncation mutants hybridized to a telomeric repeat probe. For tpz1 truncation mutants, haploid cells derived from heterozygous diploid cells were restreaked 5 times on YES plates (estimated to be 100-125 cell divisions) prior to preparation of genomic DNA. (D) Pulsed-field gel analysis of wild-type and indicated *tpz1*-truncation mutants. Chromosomal DNA was prepared from cells after restreaked twice on YES plates (estimated to be 40-50 cell divisions), and telomeric Notl fragments were visualized by hybridization to C, I, L and M-specific probes. (See Figure 4B for a NotI-restriction site map of fission yeast chromosomes.)



**Figure S11.** Binding of the Tpz1-Pot1 complex to telomere oligo primer does not depend on Tpz1-Ccq1 or Tpz1-Poz1 interaction.

(A) A schematic overview for the telomere oligonucleotide primer pull-down assay. Biotinconjugated primers were bound to streptavidin-conjugated magnetic beads, and incubated with whole cell extracts from cells to monitor Pot1-dependent binding to Tpz1. (B) Tpz1 specifically associated with the telomeric G-oligo but not the complementary telomeric C-oligo. The interaction of Tpz1 with G-oligo was lost in *pot1* $\Delta$  cells. (See Materials and Methods.) (C) Tpz1-Pot1 interaction was not affected by Tpz1-Ccq1 or Tpz1-Poz1 interaction disruption mutants. (D) Tpz1-Pot1 interaction remained intact even in *ccq1* $\Delta$  *poz1* $\Delta$  cells. Interaction between Tpz1myc and Pot1-FLAG was monitored by co-IP of Pot1-FLAG after anti-myc pull down of Tpz1myc. For whole cell extract (WCE) western blot, Cdc2 served as a loading control.



Figure S12. Characterization of Tpz1-Poz1 interaction disruption mutant cells.

Telomere length analysis by Southern blot was performed for strains used in (**A**) Tpz1, (**B**) Ccq1, (**C**) Poz1, and (**D**) Trt1<sup>TERT</sup> ChIP assays (Figures 7A-D and S13).



**Figure S13.** Raw data for Tpz1, Ccq1, Poz1 and Trt1<sup>TERT</sup> ChIP assays in Tpz1-Poz1 interaction mutant cells.

Effects of disrupting Tpz1-Poz1 interaction on telomere association for (**A**) Tpz1, (**B**) Ccq1, (**C**) Poz1 and (**D**) Trt1<sup>TERT</sup> were monitored by dot-blot ChIP assays and raw % precipitated DNA values were plotted. These data were then corrected for telomere length [36] to generate plots shown in Figure 7. Error bars represent standard error of the mean from three to eight independent experiments. Statistical analysis of ChIP data by 2-tailed Student's t-test is shown in Table S5.

Table S1 Telome	elomere length correction factors (telomere/rDNA)			
Tagged protein	Genetic background	Correction factor <sup>a</sup>		
Tpz1-myc	wt	1.00 ± 0.08		
	poz1A	4.72 ± 0.29		
	tpz1-W498R,I501R	4.71 ± 0.28		
	poz1∆ tpz1-W498R,I501R	4.86 ± 0.14		
Ccq1-myc	wt	1.00 ± 0.03		
	$poz1\Delta$	$2.63 \pm 0.09$		
	tpz1-W498R,I501R	2.69 ± 0.08		
	poz1∆ tpz1-W498R,I501R	2.63 ± 0.08		
Poz1-myc	wt	1.00 ± 0.05		
	$rap1\Delta$	3.69 ± 0.14		
	tpz1-W498R,I501R	3.78 ± 0.16		
	rap∆ tpz1-W498R,I501R	4.01 ± 0.15		
Trt1-myc	wt	1.00 ± 0.02		
	poz1A	3.72 ± 0.14		
	tpz1-W498R,I501R	4.90 ± 0.14		

#### Table 04 Tab . ... ... ~ 11

<sup>a</sup>Mean ± standard error of the mean. Values are normalized to wild-type cells with indicated tagged proteins.

Table S	2 Fission	yeast strains	s used in this study.	
Figure		Strain		Full Genotype <sup>a</sup>
3B	1	TN7204	poz1-FLAG	h <sup>-</sup> his3-D1 poz1 <sup>+</sup> ::5FLAG-TEV-Avitag-kanMX6
	2	TN7553	poz1-FLAG tpz1-myc	h <sup>*</sup> his3-D1 poz1 <sup>*</sup> ::5FLAG-TEV-Avitag-kanMX6 tpz1 <sup>*</sup> ::13myc-kanMX6
	3	JH11179	poz1-FLAG tpz1-L449R-myc	h` ade6-M216 his3-D1 poz1 ::5FLAG-TEV-Avitag-kanMX6 tpz1-L449R::13myc- kanMX6
	4	JH11241	poz1-FLAG tpz1- Y439R,L445R-myc	h <sup>-</sup> his3-D1 poz1 <sup>+</sup> ::5FLAG-TEV-Avitag-kanMX6 tpz1-Y439R,L445R::13myc- kanMX6
	5	JH11271	poz1-FLAG tpz1- Y439R,L445R,L449R-myc	h <sup>+</sup> his3-D1 poz1 <sup>+</sup> ::5FLAG-TEV-Avitag-kanMX6 tpz1-Y439R,L445R,L449R-13myc- kanMX6
3C	1	TN6770	ccq1-FLAG	h <sup>+</sup> his3-D1 ccq1 <sup>+</sup> ::5FLAG-kanMX6
	2	TN7505	ccq1-FLAG tpz1-myc	h' his3-D1 ccq1'::5FLAG-kanMX6 tpz1'::13myc-kanMX6
	3 4	JH11174 JH11238	ccq1-FLAG tpz1-L449R-myc ccq1-FLAG tpz1- V439R L445R-myc	n_ccq1_::5FLAG-kanMX6 tpz1-L449R::13myc-kanMX6 h <sup>-</sup> his3-D1 ccq1 <sup>+</sup> ::5FLAG-kanMX6 tpz1-Y439R,L445R::13myc-kanMX6
	5	JH11248	ccq1-FLAG tpz1- Y439R,L445R,L449R-myc	h <sup>+</sup> his3-D1 ccq1 <sup>+</sup> ::5FLAG-kanMX6 tpz1-Y439R,L445R,L449R-13myc-kanMX6
3D	1	YTC9716	pot1-FLAG	h <sup>+</sup> his3-D1 pot1 <sup>+</sup> ::3FLAG-kanMX
	2	JH11046	pot1-FLAG tpz1-myc	h <sup>-</sup> his3-D1 pot1 <sup>+</sup> ::3FLAG-kanMX tpz1 <sup>+</sup> ::13myc-kanMX6
	3	JH11176	pot1-FLAG tpz1-L449R-myc	h <sup>+</sup> pot1 <sup>+</sup> ::3FLAG-kanMX tpz1-L449R::13myc-kanMX6
	4	JH11244	pot1-FLAG tpz1- Y439R,L445R-myc	h <sup>+</sup> ade6-M210 his3-D1 pot1 <sup>+</sup> ::3FLAG-kanMX tpz1-Y439R,L445R::13myc-kanMX6
	5	JH11273	pot1-FLAG tpz1- Y439R,L445R,L449R-myc	h <sup>-</sup> pot1 <sup>+</sup> ::3FLAG-kanMX tpz1-Y439R,L445R,L449R-13myc-kanMX6
3E	1	TN7553	poz1-FLAG tpz1-myc	h <sup>-</sup> his3-D1 poz1 <sup>+</sup> ::5FLAG-TEV-Avitag-kanMX6 tpz1 <sup>+</sup> ::13myc-kanMX6
	2	JH11047	poz1-FLAG tpz1-[1-485]-myc	h <sup>+</sup> ade6-M210 his3-D1 poz1 <sup>+</sup> ::5FLAG-TEV-Avitag-kanMX6 tpz1-[1-485]::13myc- kanMX6
	3	JH11200	poz1-FLAG tpz1- W498R,I501R-myc	h <sup>+</sup> ade6-M216 his3-D1 poz1 <sup>+</sup> ::5FLAG-TEV-Avitag-kanMX6 tpz1- W498R,I501R::13myc-kanMX6
	4	TN7196	tpz1-myc	h <sup>-</sup> his3-D1 tpz1 <sup>+</sup> ::13myc-kanMX6
3F	1	TN6770	ccg1-FLAG	h <sup>+</sup> his3-D1 ccq1 <sup>+</sup> ::5FLAG-kanMX6
	2	TN7505	ccq1-FLAG tpz1-myc	h <sup>+</sup> his3-D1 ccq1 <sup>+</sup> ::5FLAG-kanMX6 tpz1 <sup>+</sup> ::13myc-kanMX6
	3	JH10926	ccq1-FLAG tpz1-[1-485]-myc	h his3-D1 ccq1 <sup>+</sup> ::5FLAG-kanMX6 tpz1-[1-485]::13myc-kanMX6
	4	JH11203	ccq1-FLAG tpz1- W498R,I501R-myc	h <sup>-</sup> his3-D1 ccq1 <sup>+</sup> ::5FLAG-kanMX6 tpz1-W498R,I501R::13myc-kanMX6
3G	1	YTC9716	pot1-FLAG	h <sup>+</sup> his3-D1 pot1 <sup>+</sup> ::3FLAG-kanMX
	2	JH11046	pot1-FLAG tpz1-myc	h <sup>*</sup> his3-D1 pot1 <sup>*</sup> ::3FLAG-kanMX tpz1 <sup>*</sup> ::13myc-kanMX6
	3	JH10929	pot1-FLAG tpz1-[1-485]-myc	h <sup>+</sup> his3-D1 pot1 :::3FLAG-kanMX tpz1-[1-485]::13myc-kanMX6
	4	JH11190	W498R,I501R-myc	п ропзгLAG-кания (р21-w496к,1301к13ттус-кания б
4A	1	CF484	tpz1 <sup>+</sup> /tpz1 <sup>+</sup>	h <sup>+</sup> /h <sup>-</sup> ade6-M210/ade6-M216 his3-D1/his3-D1
	2,16	TN2411	tpz1	$h^{+}his3-D1$
	3	JH11365	tpz1 /tpz1-myc	n /h ade6-M210/ade6-M216 his3-D1/his3-D1 tpz1 /tpz1 ::13myc-kanMX6
	4,15 5	IN/196	$tpz_1-myc$	n nis3-D1 tp21 ::13myc-kaniXto h <sup>+</sup> /h <sup>-</sup> ada6 M210/ada6 M216 hia <sup>2+</sup> /hia2 D1 taz1 <sup>+</sup> /taz1 L440B::12mya kaniMX6
	5	JH11835	1021 / 1021 - 1449R - 1190 1021 - 1449R - 1190	$h^{\dagger}$ ade6-M210/due0-M210/HS3/HIS3-D1 (p21/lp21-L449R13)Hyc-KallMX0
	7	JH12260	tpz1-L449R-myc (5x)	$h^{\dagger}$ ade6-M210 his3-D1 tp21-L449R::13myc-kanMX6 (5x restreaks)
	8	JH11495	tpz1 <sup>+</sup> /tpz1-Y439R,L445R-myc	h <sup>+</sup> /h <sup>-</sup> ade6-M210/ade6-M216 his3 <sup>+</sup> /his3-D1 tpz1 <sup>+</sup> /tpz1-L439R,L445R::13myc- kanMX6
	9	JH11496	tpz1-Y439R,L445R-myc (2x)	h <sup>-</sup> ade6-M210 his3-D1 tpz1-L439R,L445R::13myc-kanMX6 (2x restreaks)
	10	JH12261	<i>tpz1-Y439R,L445R-myc</i> (5x)	h ade6-M210 his3-D1 tpz1-L439R,L445R::13myc-kanMX6 (5x restreaks)
	11	JH11500	tpz1⁺/tpz1- Y439R,L445R,L449R-myc	h <sup>*</sup> /h <sup>-</sup> ade6-M210/ade6-M216 his3 <sup>*</sup> /his3-D1 tpz1 <sup>*</sup> /tpz1- L439R,L445R,L449R::13myc-kanMX6
	12	JH11501	tpz1-Y439R,L445R,L449R- myc (2x)	h <sup>-</sup> ade6-M216 his3-D1 tpz1-L439R,L445R,L449R::13myc-kanMX6 (2x restreaks)
	13	JH12262	tpz1-Y439R,L445R,L449R- myc (5x)	h <sup>-</sup> ade6-M216 his3-D1 tpz1-L439R,L445R,L449R::13myc-kanMX6 (5x restreaks)
	14	TN9009	tpz1-myc ccq1 $\Delta$	h <sup>+</sup> his3-D1 tpz1-13myc:KanMX6 ccq1∆::hphMX

Figure		Strain		Full Genotype <sup>a</sup>
4B	1	TN11289	tpz1 <sup>+</sup>	h <sup>-</sup> his3-D1 tpz1 <sup>+</sup> ::hphMX
	2	CF448	trt1Δ	h ade6-M210 his3-D1 trt1∆∷his3⁺
	3	TN9258	ccq1A	h <sup>-</sup> his3-D1 ccq1 <u>A</u> ::hphMX (linear)
	4	TN9259	$ccg1\Delta$	h <sup>-</sup> his3-D1 ccg1 <u>A</u> ::hphMX (circular)
	5	JH12993	tpz1-L449R	h <sup>?</sup> ade6-M210 or M216 his3-D1 tpz1-L449R::hphMX
	6	JH12995	tpz1-L449R	h <sup>?</sup> ade6-M210 or M216 his3-D1 tpz1-L449R::hphMX
	7	JH12986	tpz1-Y439R,L445R	h <sup>?</sup> ade6-M210 or M216 his3-D1 tpz1-Y439R,L445R::hphMX
	8	JH12988	tpz1-Y439R,L445R	h <sup>²</sup> ade6-M210 or M216 his3-D1 tpz1-Y439R,L445R::hphMX
	9	JH12990	tpz1-Y439R,L445R,L449R	h <sup>?</sup> ade6-M210 or M216 his3-D1 tpz1-Y439R,L445R,L449R::hphMX
	10	JH12992	tpz1-Y439R,L445R,L449R	h <sup>?</sup> ade6-M210 or M216 his3-D1 tpz1-Y439R,L445R,L449R::hphMX
		-	, ,+ ,+ ,+	
4C	1,7,13	IN2411	tpz1 ccq1 poz1	h his3-D1
	2	IN/196	tpz1-myc	n nis3-D1 tpz1 ::13myc-kanMX6
	3	JH12998	tpz1-L449R-myc	n adeb-M216 nis3-D1 tpz1-L449R::13myc-kanixx6
	4	JH13002		n nis3-D1 ccq1 $\Delta$ ::npnMX
	5	TN9009	ccq1 <sub>Δ</sub> tpz1-myc	n nis3-D1 ccq1A::npnMX tpz1 ::13myc-kanMX6
	0	JH 1 1004	ccq1A tpz1-L449R-myc	n nis3-D1 ccq1A::npnMX tp21-L449R-13myc:KanMX6
	8	JH12999	pozī	n adeb-M216 nis3-D1 poz1A::natMX6
	9	1109254	poz1 <u>A</u> ccq1 <u>A</u>	h his3-D1 poz1A::natMX6 ccq1A::hphMX
	10	YIC9366	poz1A tpz1-myc	h his3-D1 poz1A::natMX6 tpz1 ::13myc-kanMX6
	11	JH11701	poz1A ccq1A tpz1-myc	h his3-D1 poz1A::natMX6 ccq1A::nphMX tpz1 ::13myc-kanMX6
	12	JH11686	poz1∆ tpz1-L449R-myc	h_ade6-M216 his3-D1 poz1∆::natMX6 tpz1-L449R::13myc-kanMX6
4D	1	TN7196	toz1-myc	h <sup>-</sup> his3-D1 tnz1 <sup>+</sup> ··13mvc-kanMX6
ΨD	2	YTC9366	$p_{0}z_{1}$ $h_{0}z_{1}$	h <sup>-</sup> his3-D1 poz1A::natMX6 tpz1 <sup>+</sup> ::13mvc-kanMX6
	3	TN9009	cca1A to $z1$ -myc	$h^{+}$ his 3-D1 cca1A::hnhMX tnz1 <sup>+</sup> ::13myc-kanMX6
	4	JH11701	poz1A cca1A toz1-mvc	$h^{+}$ his3-D1 poz1A::natMX6 ccg1A::hphMX tpz1^{+:13mvc-kanMX6
	5	JH11835	tpz1-I 449R-mvc	$h^{\dagger}$ ade6-M210 his3-D1 tpz1-L449R::13mvc-kanMX6
	6	JH11686	$poz1\Lambda$ tpz1-L449R-mvc	h ade6-M216 his3-D1 poz1/.:natMX6 tpz1-L449R::13mvc-kanMX6
	7	JK11683	$cca1\Delta$ tpz1-L449R-mvc	$h^{+}$ his3-D1 ccg1 $\Delta$ ::hphMX tpz1-L449R::13mvc-kanMX6
5A	1	TN2411	<i>tpz1</i> ⁺ (no tag)	h <sup>-</sup> his3-D1
	2	TN7196	tpz1-myc	h his3-D1 tpz1 <sup>+</sup> ::13myc-kanMX6
	3	TN9009	tpz1-myc ccq1 $\Delta$	h <sup>*</sup> his3-D1 tpz1 <sup>*</sup> ::13myc-kanMX6 ccq1∆::hphMX
	4	JH11835	tpz1-L449R-myc	h ade6-M210 his3-D1 tpz1-L449R::13myc-kanMX6
	5	JH11496	tpz1-Y439R,L445R-myc	h ade6-M210 his3-D1 tpz1-L439R,L445R::13myc-kanMX6
	6	JH11232	tpz1-Y439R,L445R,L449R-	n ade6-M210 his3-D1 tpz1-Y439R,L445R,L449R::13MyC-kanMX6
			inge	
5B	1	JH11289	<i>ccq1</i> ⁺ (no tag)	h <sup>-</sup> his3-D1 tpz1 <sup>+</sup> ::hphMX
	2	JH11569	ccq1-myc	h <sup>+</sup> his3-D1 ccq1 <sup>+</sup> ::13myc-kanMX6 tpz1 <sup>+</sup> ::hphMX
	3	JH11622	ccq1-myc tpz1-L449R	h <sup>+</sup> his3-D1 ccq1 <sup>+</sup> ::13myc-kanMX6 tpz1-L449R::hphMX
	4	JH11452	ccq1-myc tpz1-Y439R,L445R	h <sup>+</sup> his3-D1 ccq1 <sup>+</sup> ::13myc-kanMX6 tpz1-Y439R,L445R::hphMX
	5	JH11609	ccq1-myc tpz1-	h <sup>+</sup> his3-D1 ccq1 <sup>+</sup> ::13myc-kanMX6 tpz1-Y439R,L445R,L449R::hphMX
			Y439R,L445R,L449R	
50	1	IH11280	$trt1^+$ (no tag)	h bis3-D1 toz1+bobMX
50	2	JH11630	trt1-mvc	$h^{-}$ ade6-M216 his3-D1 trt1 <sup>+</sup> ··G <sub>0</sub> -13mvc-kanMX6 trz1 <sup>+</sup> ··hphMX
	3	JH11626	trt1-myc toz1-l 449R	$h^{-}$ ade6-M216 his3-D1 trt1 <sup>+</sup> ::G <sub>2</sub> -13mvc-kanMX6 trz1-L449R::hphMX
	4	JH11449	trt1-mvc tpz1-Y439R.L445R	h <sup>+</sup> ade6-M210 his3-D1 trt1 <sup>+</sup> ::G <sub>8</sub> -13mvc-kanMX6 tpz1-Y439R.L445R::hphMX
	5	JH11611	trt1-myc tpz1-	$h^{-}$ ade6-M210 his3-D1 trt1 <sup>+</sup> ::G <sub>8</sub> -13myc-kanMX6 tpz1-
			Y439R,L445R,L449R	Y439R,L445R,L449R::hphMX
	6	JH11644	trt1-myc ccq1 $\Delta$	h <sup>+</sup> his3-D1 trt1 <sup>+</sup> ::G₀-13myc-kanMX6 tpz1 <sup>+</sup> ::hphMX ccq1∆::hphMX
5D	1	IN6770	ccq1-FLAG	n his3-D1 ccq1 ::5FLAG-kanMX6
	2	IN10988	trt1∆ ccq1-FLAG	h ade6-M210 his3-D1 trt1∆::his3 ccq1 ::5FLAG-kanMX6
	3	IN10991	trt1∆ ccq1-T93A-FLAG	h ade6-M210 his3-D1 trt1∆::his3" ccq1-T93A::5FLAG-kanMX6
	4	JH11174	ccq1-FLAG tpz1-L449R-myc	n ccq1 ::5FLAG-kanMX6 tpz1-L449K::13myc-kanMX6
	Э	JH11238	ccq1-FLAG	п пізз-и і ссqт ::энцаG-капмхь трz1-Y439R,L445R::13myC-капМХб
	6	JH11248	cca1-FI AG toz1-	h <sup>+</sup> his3-D1 cca1 <sup>+</sup> 5FI AG-kanMX6 tnz1-Y439R I 445R I 449R-13mvc-kanMX6
	-		Y439R,L445R,L449R-myc	

Figure		Strain		Full Genotype <sup>a</sup>
5E	1	TN6770	cca1-FLAG	$h^{+}$ his3-D1 cca1 <sup>+</sup> 5ELAG-kanMX6
02	2	TN10535	ran1/ ccg1-FLAG	$h^{-}$ his3-D1 ran1A::ura4 <sup>+</sup> cca1 <sup>+</sup> ::5ELAG-kanMX6
	3	BAM1082	rap1/ ccg1-T93A-FLAG	h his3-D1 rap1Aura4 <sup>+</sup> ccq1-T93A5ELAG-kanMX6
	U U	9		
	4	JH11544	rap1∆ tpz1-L449R-myc ccq1- FLAG	h⁻ his3-D1 rap1∆∷ura4⁺ tpz1-L449R-13myc-kanMX6 ccq1⁺::5FLAG-kanMX6
	5	JH11546	rap1∆ tpz1-Y439R,L445R- myc ccq1-FLAG	h⁻ his3-D1 rap1∆::ura4* tpz1-Y439R,L445R-13myc-kanMX6 ccq1*::5FLAG- kanMX6
	6	JH11548	rap1∆ tpz1- Y439R,L445R,L449R-myc ccq1-FLAG	h <sup>+</sup> his3-D1 rap1∆::ura4 <sup>+</sup> tpz1-Y439R,L445R,L449R-13myc-kanMX6 ccq1 <sup>+</sup> ::5FLAG-kanMX6
6A	1	JH11365	tpz1⁺/tpz1-myc	h⁺/h⁻ ade6-M210/ade6-M216 his3-D1/his3-D1 tpz1⁺/tpz1⁺::13myc-kanMX6
	2	JH11715	tpz1 <sup>+</sup> /tpz1-[1-485]-myc	h <sup>+</sup> /h <sup>-</sup> ade6-M210/ade6-M216 his3-D1/his3-D1 tpz1 <sup>+</sup> /tpz1-[1-485]::13myc-kanMX6
	3	JH11189	tpz1 <sup>+</sup> /tpz1-W498R,I501R-myc	h <sup>+</sup> /h <sup>-</sup> ade6-M210/ade6-M216 his3-D1/his3-D1 tpz1 <sup>+</sup> /tpz1-W498R,I501R::13myc- kanMX6
	4	TN2411	tpz1 <sup>+</sup>	h <sup>-</sup> his3-D1
	5	TN7196	tpz1-myc	h⁻ his3-D1 tpz1⁺::13myc-kanMX6
	6	JH13000	poz1Δ	h <sup>-</sup> ade6-M216 his3-D1 poz1∆::natMX6
	7	YTC9366	tpz1-myc poz1 $\Delta$	h⁻ his3-D1 tpz1⁺::13myc-kanMX6 poz1∆::natMX6
	8	JH10923	tpz1-[1-485]-myc	h <sup>-</sup> ade6-M210 his3-D1 tpz1-[1-485]::13myc-kanMX6
	9	JH13004	tpz1-W498R,I501R-myc	h <sup>+</sup> ade6-M216 his3-D1 tpz1-W498R,I501R::13myc-kanMX6
	10	JH11693	tpz1-W498R,I501R-myc poz1∆	h <sup>-</sup> ade6-M216 his3-D1 tpz1-W498R,I501R::13myc-kanMX6 poz1∆::natMX6
	11	JH11689	tpz1-W498R,I501R-myc ccq1∆	h <sup>™</sup> his3-D1 tpz1-W498R,I501R::13myc-kanMX6 ccq1∆::hphMX
	12	JH11701	tpz1-myc poz1 $\Delta$ ccq1 $\Delta$	h <sup>+</sup> his3-D1 tpz1 <sup>+</sup> ::13myc-kanMX6 poz1 $\Delta$ ::natMX6 ccq1 $\Delta$ ::hphMX
6B	1	TN7196	tpz1-myc	h <sup>-</sup> his3-D1 tpz1 <sup>+</sup> ::13myc-kanMX6
	2	JH11190	tpz1-W498R,I501R-myc	h <sup>+</sup> leu1-32 ura4-D18 ade6-M216 his3-D1 tpz1-W498R,I501R::13myc-kanMX6
	3	JH11692	tpz1-W498R,I501R-myc poz1∆	h⁻ leu1-32 ura4-D18 ade6-M216 his3-D1 tpz1-W498R,I501R::13myc-kanMX6 poz1∆::natMX6
	4	JH11689	tpz1-W498R,I501R-myc ccq1Δ	h <sup>°</sup> his3-D1 tpz1-W498R,I501R::13myc-kanMX6 ccq1∆::hphMX
	5	JH11701	tpz1-myc poz1 $\Delta$ ccq1 $\Delta$	$h^+$ his3-D1 tpz1 $^+$ ::13myc-kanMX6 poz1 $\Delta$ ::natMX6 ccq1 $\Delta$ ::hphMX
6C	1,8	TN2411	tpz1 <sup>+</sup>	h <sup>-</sup> his3-D1
	2	TN7196	tpz1-myc	h <sup>-</sup> his3-D1 tpz1 <sup>+</sup> ::13myc-kanMX6
	3	JH11835	tpz1-L449R-myc	h⁺ ade6-M210 his3-D1 tpz1-L449R::13myc-kanMX6
	4	JH10922	tpz1-[1-485]-myc	h ade6-M210 his3-D1 tpz1-[1-485]::13myc-kanMX6
	5	JH11790	tpz1-[1-485]-L449R-myc	h <sup>-</sup> ade6-M216 his3-D1 tpz1-[1-485]-L449R::13myc-kanMX6
	6	JH11190	tpz1-W498R,I501R-myc	h <sup>+</sup> ade6-M216 his3-D1 tpz1-W498R,I501R::13myc-kanMX6
	7	JH11781	tpz1-L449R,W498R,I501R- myc	h <sup>+</sup> ade6-M216 his3-D1 tpz1-L449R,W498R,I501R::13myc-kanMX6
6D	1	1111025	to 71 / 110 m/a	ht ada6 M210 his2 D1 toz1 / 1100:12mus Kap1176
00	ו 2	JELI 1000 1H10000	1pz1-L449R-11190 tpz1-[1-185]-mva	11 auto-11121011133-12111221-12449171311196-Kal1111170 h <sup>-</sup> ade6-M210 his2-D1 thz1-[1-185]:13m/s kanMV6
	2	JH 10922	(p21-[1-405]-11)yC	1 adeo-m210 ms-5-D1 (p21-[1-405]13myc-kalimxo h <sup>-</sup> ade6 M216 his2 D1 tpz1 [1.485] L440D::12myc kanMX6
	3	JH11790	(p21-[1-405]-L449R-IIIyC	11 adeo-11/210 11/53-D1 (p21-[1-403]-L449R1311/jC-KallMAO
	5	JH11781	tpz1-L449R,W498R,I501R- mvc	h <sup>+</sup> ade6-M216 his3-D1 tpz1-L449R,W498R,I501R::13myc-kanMX6
			, •	
7A	1	TN7196	tpz1-myc	h his3-D1 tpz1"::13myc-kanMX6
	2	Y I C9366	$tpz1-myc poz1\Delta$	h his3-D1 tpz1∵:13myc-kanMX6 poz1∆::natMX6
	3	JH11191	tpz1-W498R,I501R-myc	h ade6-M216 his3-D1 tpz1-W498R,501R::13myc-kanMX6
	4	JH11692	tpz1-W498R,I501R-myc poz1∆	h_ade6-M216 his3-D1 tpz1-W498R,I501R::13myc-kanMX6 poz1∆::natMX6
7B	1	TN7217	cca1-mvc	h <sup>°</sup> his3-D1 ccq1 <sup>+</sup> ··13mvc-kanMX6
	2	YTC8712	$cca1-mvc$ $poz1\Lambda$	$h^{\dagger}$ his3-D1 ccq1 <sup>+</sup> ::13mvc-kanMX6 poz1A::natMX6
	3	JH12895	ccq1-myc tpz1-W498R,I501R	h <sup>+</sup> his3-D1 ccq1 <sup>+</sup> ::13myc-kanMX6 tpz1-W498R,I501R::hphMX
	4	JH12897	ccq1-myc tpz1-W498R,I501R	h <sup>°</sup> his3-D1 ccq1 <sup>+</sup> ::13myc-kanMX6 tpz1-W498R,I501R::hphMX poz1∆::natMX6
			poz1A	

TC         1         JH12265         pot -myc         In hig3-01 pot 1:::3myc-kanMX6 tot 1::nphMX           3         JH12265         pot -myc tgt 1-W498R.(501R         In hig3-01 pot 1:::3myc-kanMX6 tot 1::nphMX           4         JH12265         pot -myc tgt 1-W498R.(501R         In adde-M210 hig3-01 pot 1:::3myc-kanMX6 tgt 1::M498R.(501R::hphMX           7D         1         JH11205         if 1:myc         In adde-M210 hig3-01 pot 1:::3myc-kanMX6 tgt 1::hpMX           7D         1         JH11205         tirt-myc         In adde-M216 hig3-01 tpt 1::G_1-Smyc-kanMX6 tgt 1::hpMX           7D         1         JH11270         tirt-myc tgt 1::Myc kanMX6 tgt 1::hpMX         in adde-M216 hig3-01 tpt 1::G_1-Smyc-kanMX6 tgt 1::hpMX           7E         1         TM1031         tirt-myc tgt 1::M498R.(501R         in adde-M216 hig3-01 tpt 1::HgMX           7E         1         TM1070         cod1-FLAG pot 1         in his3-01 cod1::SFLAG-kanMX6 tgt 1:-hpMX           8         TM10308         cod1-FLAG pot 1:-hgM2         in his3-01 cod1::SFLAG-kanMX6 tgt 1:-Ha98R.(501R::I3myc-kanMX6           6         JH11702         cod1-FLAG tgt 1:-488         in his3-01 cod1::SFLAG-kanMX6 tgt 1:-Ha98R.(501R::I3myc-kanMX6           6         JH11702         cod1-FLAG tgt 1:-488         in adde-M216 his3-01 tccd1::SFLAG-kanMX6 tgt 1:-Ha98R.(501R::I3myc-kanMX6           7	Figure		Strain		Full Genotype <sup>a</sup>
10         2         JH12297 3         JH12297 3 <th>70</th> <th>1</th> <th>IH12265</th> <th>poz1-myc</th> <th><math>b^{\dagger}</math> his 3-D1 poz1<sup>+</sup>··13myc-kanMX6 tpz1<sup>+</sup>··hnhMX</th>	70	1	IH12265	poz1-myc	$b^{\dagger}$ his 3-D1 poz1 <sup>+</sup> ··13myc-kanMX6 tpz1 <sup>+</sup> ··hnhMX
2         JH12850 pozt-myc tpz1-W498R,IS01R rp11         in adde-M210 his3bD1 pozt1::13myc-kanMX6 tpz1-W498R,IS01R::hphMX rp21-myc tpz1-W498R,IS01R rp11           7D         1         JH12056 zm1         th1.myc pozt-myc tpz1-W498R,IS01R rp11         in adde-M210 his3bD1 poz1::13myc-kanMX6 tpz1-W498R,IS01R::hphMX rap11.ure4           7D         1         JH12700 zm1         th1.myc pozt-myc tpz1-W498R,IS01R rp11         in adde-M216 his3bD1 tr11::Ge-13myc-kanMX6 tpz1::hphMX rap11.ure4           7D         1         JH12700 zm1         tt1.myc tr1.myc poz1A zm150         in adde-M216 his3bD1 tr11::Ge-13myc-kanMX6 tpz1::hphMX rm150           7E         1         TN6770 zm1         ccq1-FLAG tr1.mgtMzFLAG poz1A rm15051         in his3bD1 ccq1::SFLAG-kanMX6 poz1A::nstMX6 zm1         in his3bD1 ccq1::SFLAG-kanMX6 poz1A::nstMX6 rm153bD1 ccq1::SFLAG-kanMX6 poz1A::nstMX6 rm153bD1 ccq1::SFLAG-kanMX6 poz1A::nstMX76 rm153bD1 ccq1::SFLAG-kanMX6 tpz1-W498R,IS01R::T3myc-kanMX6 zm1           7E         1         TN6770 zcq1-FLAG tpz1-rm2 rm1453         ccq1-FLAG tpz1-rm2 rm1453         in his3-D1 ccq1::SFLAG-kanMX6 tpz1-W498R,IS01R::T3myc-kanMX6 rm13bD1 ccq1::SFLAG-kanMX6 tpz1-W498R,IS01R::T3myc-kanMX6 rm14542           538         1.5         TN6770 zcq1-FLAG tpz1-rL498-rm2 rm14539         in i	10	2	JH12267	poz1-myc ran1 A	$h^+$ his3-D1 poz1 <sup>+</sup> ::13myc-kanMX6 tpz1 <sup>+</sup> ::hphMX ran14::ura4 <sup>+</sup>
3         3112036         pp:11/m/p; pi:11/m/p; pi:11/m/p; high=01/mix1/mix1/mix1/mix2/mix2/mix2/mix2/mix2/mix2/mix1/mix2/mix2/mix2/mix2/mix2/mix2/mix2/mix2		2	1412650	poz1 myc taz1 W/408P I501P	$h^{+}$ ade6 M210 bis2 D1 poz1 <sup>+</sup> ··12mvc kapMY6 tra1 M/408D I501D··bpbMY
4         Sifteodo         pot / migo primesor, funditionado         pot / migo primesor, funditionado           7D         1         JH11630         tt1-myc         pot / migo primesor, funditionado         primesor, funditionado           7D         1         JH12770         tt1-myc         pot / migo primesor, funditionado         primesor, funditionado           2         JH12770         tt1-myc pot / migo primesor, funditionado         h ade6-M216 his3-D1 tt1": Ge_1-Tanyc-kanMX6 fprimeNX pot / mission           7E         1         TN6770         ccq1-FLAG poz / h         h his3-D1 ccq1": SFLAG-kanMX6 fprimeNX fprimeNX pot / mission           3         TN12036         ccq1-FLAG poz / h         h his3-D1 ccq1": SFLAG-kanMX6 fprimeNX fprimeNX fprimesor, fmrimesor, fmrime		3	JH12059	poz1 myc tpz1 W/498R,1501R	$h^{+}$ ade6 M210 his3 D1 poz1 ISINYC-KaliwiX0 (pz1-W496R, ISUTR IpinwiX) $h^{+}$ ade6 M210 his3 D1 poz1 <sup>+</sup> ··13mvc kapMX6 tra1 M/408D [501D::hphMX]
TD         1         JH11630 It11-myc         in ade6-M216 his3-D1 tt11::G_r13myc-kanMX6 tpz1::hphMX h ade6-M216 his3-D1 tt11::G_r13myc-kanMX6 tpz1::hphMX           7D         1         TN0570 JH1276         cq1-FLAG         h ade6-M216 his3-D1 tt11::G_r13myc-kanMX6 tpz1:-mphMX           7E         1         TN0570 TN10531         cq1-FLAG poz1A         h his3-D1 cq11::SFLAG-kanMX6 poz1.:matMX6           3         TN10236         cq1-FLAG poz1A         h his3-D1 cq11::SFLAG-kanMX6 poz1.:matMX6           4         JH10206         cq1-FLAG poz1A         h his3-D1 cq11::SFLAG-kanMX6 poz1.:matMX6           5         JH11203         cq1-FLAG poz1A         h his3-D1 cq11::SFLAG-kanMX6 tpz1-tW49BR.J501R::T3myc-kanMX6           6         JH11772         cc1-FLAG pz1-th497         h his3-D1 cq11::SFLAG-kanMX6 tpz1-tW49BR.J501R::T3myc-kanMX6           6         JH11772         cc1-FLAG pz1-th497         h his3-D1 cq11::SFLAG-kanMX6 tpz1-tW49BR.J501R::T3myc-kanMX6           7.5         TN7605         cc1-FLAG tpz1-twp         h is3-D1 cq11::SFLAG-kanMX6 tpz1-tW49BR.J501R::T3myc-kanMX6           8.3         1.5         TN6770         cc1-FLAG tpz1-t49A         h is3-D1 cq11::SFLAG-kanMX6 tpz1-t449A::T3myc-kanMX6           7         TN14558         tpz1-t49A (5x)         h ade6-M216 his3-D1 tpz1-t49A::thphMX           8.3         1         TN14559         tpz1-t49A (2x)		4	J112030	ron14	ran14::ura4*
7D       1       JH11630       trt1-myc pot 1/s       h ade6-M216 his3-D1 trt1":G13myc-kanMX6 tpz1":hphMX pot 1/::natMX6         7E       1       TN6770       ccq1-FLAG pot 1/s       h is3-D1 ccq1":iSFLAG-kanMX6 pot 1/::natMX6         7E       1       TN06710       ccq1-FLAG pot 1/s       h is3-D1 ccq1":iSFLAG-kanMX6 pot 1/::natMX6         7       TN10531       ccq1-FLAG pot 1/s       h is3-D1 ccq1":iSFLAG-kanMX6 pot 1/::natMX6         6       JH11203       ccq1-FLAG tpz1-1/:485/myc       h is3-D1 ccq1":iSFLAG-kanMX6 tpz1-1/:485/::13myc-kanMX6         6       JH11203       ccq1-FLAG tpz1-1/:485/myc       h is3-D1 ccq1":iSFLAG-kanMX6 tpz1-1/:485/:501R-myc-kanMX6         6       JH11772       ccq1-FLAG tpz1-1/:485       h is3-D1 ccq1":iSFLAG-kanMX6 tpz1-1/:489R.J501R::13myc-kanMX6         7       JH11703       ccq1-FLAG tpz1-1/:485       h is3-D1 ccq1":iSFLAG-kanMX6 tpz1-1/:498R.J501R::13myc-kanMX6         83A       1.5       TN6770       ccq1-FLAG tpz1-t49A       h is3-D1 ccq1":iSFLAG-kanMX6 tpz1-1/:492R.impc-kanMX6         7.3       JH1172       ccq1-FLAG tpz1-t49A       h is3-D1 ccq1":iSFLAG-kanMX6 tpz1-1/:492R.impc-kanMX6       h is3-D1 tpz1':iSFLAG-kanMX6 tpz1-1/:492R.impkMX       h is3-D1 tpz1':iSFLAG-kanMX6 tpz1-1/:492R.impkMX       h is3-D1 tpz1':iSFLAG-kanMX6 tpz1-1/:492R.impkMX       h is3-D1 tpz1':iSFLAG-kanMX6 tpz1-1/:492R.impkMX       h is3-D1 tpz1':iSFLAG-kanMX6 tpz1':impc-kanMX6 <t< td=""><td></td><td></td><td></td><td>Ταρ ΤΔ</td><td>Tap 12ura4</td></t<>				Ταρ ΤΔ	Tap 12ura4
1         1	7D	1	JH11630	trt1-mvc	h <sup>-</sup> ade6-M216 his3-D1 trt1 <sup>+</sup> ···G <sub>2</sub> -13mvc-kanMX6 tnz1 <sup>+</sup> ··hnhMX
2         0111173         0111173         0111173         0111173         0111173         011173         011173<	10	2	IH12770	trt1-myc poz1 A	$h^{-}$ ade6-M216 his3-D1 trt1 <sup>+</sup> ::C -13mvc-kanMX6 tp21phMX poz14::patMX6
3         3         3         3         1111000         1111000         1111000         11110000 <t< td=""><td></td><td>2</td><td>1412766</td><td>trt1-myc po212 trt1-myc to21-W/408P I501P</td><td>h<sup>-</sup> his3-D1 trt1<sup>+</sup>··C<sub>2</sub>-13mvc-kanMY6 tnz1-W/08P I501P··hphMY</td></t<>		2	1412766	trt1-myc po212 trt1-myc to21-W/408P I501P	h <sup>-</sup> his3-D1 trt1 <sup>+</sup> ··C <sub>2</sub> -13mvc-kanMY6 tnz1-W/08P I501P··hphMY
7E       1       TN6770       ccq1-FLAG       h' his3-D1 ccq1'::SFLAG-kanMX6         2       TN10531       ccq1-F2AG [pz11A       h' his3-D1 ccq1'::SFLAG-kanMX6       hot status         4       JH10926       ccq1-FLAG [pz1](-485]-myc       h' his3-D1 ccq1'::SFLAG-kanMX6 [pz1-Li-a8B]::T3myc-kanMX6         5       JH11203       ccq1-FLAG [pz1](-485]-myc       h' his3-D1 ccq1'::SFLAG-kanMX6 [pz1-W498R.J501R:::T3myc-kanMX6         6       JH1172       ccq1-FLAG [pz1-h       h' ade6-M216 his3-D1 ccq1'::SFLAG-kanMX6 [pz1-W498R.J501R:::T3myc-kanMX6         S3A       1.5       TN6770       ccq1-FLAG [pz1-myc       h' ade6-M216 his3-D1 ccq1'::SFLAG-kanMX6 [pz1-W498R.J501R:::T3myc-kanMX6         S4A       1.5       TN6700       ccq1-FLAG [pz1-myc       h' his3-D1 ccq1'::SFLAG-kanMX6 [pz1-L4498.HX6         5.6       TN7505       ccq1-FLAG [pz1-L449A.myc       h' his3-D1 [pz1-L449A.HX6 [pz1-L449A.HX6]       h' his3-D1 [pz1-L449A.HX6]         6       JH12780       ccq1-FLAG [pz1-L449A.HX6]       h' his3-D1 [pz1-L449A.HX6]       hi his3-D1 [pz1-L449A.HX6]         7.1       TN14550       [pz1-hq4A].K2]       h ade6-M216 his3-D1 [pz1-L449A.HX6]       hi his3-D1 [pz1-L449A.HX6]         8       1       TN14550       [pz1-hq4A].K2]       h ade6-M216 his3-D1 [pz1-L449A.HX6]       h ade6-M216 his3-D1 [pz1-L449A.HX6]         8       TN14551 </td <td></td> <td>5</td> <td>51112700</td> <td></td> <td></td>		5	51112700		
1         TNI0531         ccq1-FLAG poz1A         h his3-D1 ccq1::SFLAG-kanlXK6 poz1A::natlXX6           3         TN12036         ccq1-FLAG poz1A         h his3-D1 ccq1::SFLAG-kanlXK6 poz1A::natlXX6           4         JH10203         ccq1-FLAG tpz1-i-K65/myc         h his3-D1 ccq1::SFLAG-kanlXK6 poz1A::natlXX6           5         JH11203         ccq1-FLAG tpz1-i-K65/myc         h his3-D1 ccq1::SFLAG-kanlXK6 tpz1-W498R.j501R::13myc-kanlXX6           6         JH1172         ccq1-FLAG tpz1-i-K65/myc         h his3-D1 ccq1::SFLAG-kanlXK6 tpz1-W498R.j501R::13myc-kanlXX6           7         TN6770         ccq1-FLAG tpz1-i-K64 tpz1-i-K64 tpz1-myc         h his3-D1 ccq1::SFLAG-kanlXK6 tpz1-W498R.j501R::13myc-kanlXX6           2.6         TN7505         ccq1-FLAG tpz1-i-K49R-myc         h his3-D1 ccq1::SFLAG-kanlXK6 tpz1-i-K49R-myc kanlX26           3.7         JH1174         ccq1-FLAG tpz1-i-K49R-myc         h his3-D1 ccq1::SFLAG-kanlX6 tpz1-i-K49R-i:Tamyc-kanlX26           4.8         JH12780         ccq1-FLAG tpz1-i-K49R-myc         h rimis3-D1 tpg1:-K1449R-i:Tamyc-kanlX26           5.7         TN14539         tpz1-i-K49R-myc         h rimis3-D1 tpg1:-L449A.i:Tamyc-kanlX26           6         TN14539         tpz1-i-K49A.i:Tamyc-kanlX26         tpz1-i-K49A.i:Tamyc-kanlX26           7         TN14539         tpz1-i-K49A.i:Tamyc-kanlX26         tpz1-i-K49A.i:Tamyc-kanlX26	7F	1	TN6770	cca1-FLAG	h <sup>+</sup> his3-D1 ccq1 <sup>+</sup> 5ELAG-kanMX6
2         Initiation           3         Thit203         continues of the second	. –	2	TN10531	cca1-ELAG poz14	$h^{-}$ his3-D1 cca1 <sup>+</sup> ::5ELAC-kanMY6 poz14::patMY6
3         Initiation         Initiation         Initiation           4         JH1023         cct1-FLAG tpz1-1/-485/mvpc         Initiation         Initiation           5         JH1123         ccct1-FLAG tpz1-1/-485/mvpc         Initiation         Initiation           6         JH1172         cccl1-FLAG tpz1-1/-485/mvpc         Initiation         Initiation         Initiation           6         JH1172         cccl1-FLAG tpz1-mvpc         Initiation         Initiation         Initiation           6         JH1172         cccl1-FLAG tpz1-mvpc         Initiation         Initiation         Initiation         Initiation           7         JH11174         cccl1-FLAG tpz1-L449R-mvpc         Initiation         Initiation         Initiation         Initiation           3.7         JH11174         cccl1-FLAG tpz1-L449R-mvpc         Initiation         Initiation         Initiation         Initiation           3.7         JH11174         cccl1-FLAG tpz1-L449R-mvpc         Initiation         Initiatiation         Initiati		2	TN12036	ccg1 TO2A ELAG poz $1A$	h his2 D1 ccq1 T02A::5ELAG kanMX6 poz1A::natMX6
s         JH11203         ccq1+FLA G [pz1+ W498R, I501R-myc         h         his3-D1 ccq1:::5FLAG-kanlMX6 [pz1+W498R, I501R:::13myc-kanlMX6           6         JH11772         ccq1-FLA G [pz1- W498R, I501R-myc         h         ade6-M216 his3-D1 ccq1'::5FLAG-kanlMX6 [pz1-W498R, I501R:::13myc-kanlMX6           S3A         1,5         TN6770         ccq1-FLAG [pz1- W498R, I501R-myc poz1A         h         ade6-M216 his3-D1 ccq1'::5FLAG-kanlMX6 [pz1-W498R, I501R:::13myc-kanlMX6           S3A         1,5         TN6770         ccq1-FLAG [pz1-myc         h         his3-D1 ccq1'::5FLAG-kanlMX6 [pz1-L449R.::13myc-kanlMX6           4,8         JH12780         ccq1-FLAG [pz1-L449R-myc         h         his3-D1 ccq1'::5FLAG-kanlMX6 [pz1-L449A:::13myc-kanlMX6           53B         1         TN14536         [pz1-L449A (zk)         h         his3-D1 ccq1'::5FLAG-kanlX8 [pz1-L449A:::13myc-kanlMX6           53B         1         TN14536         [pz1-L449A (zk)         h         his3-D1 tcq1'::1449A (zk)         h           53         TN14537         [pz1-L449A (zk)         h         ade6-M216 his3-D1 [pz1-L449A:::hphMX (zk restreaks)         h           54         TN14540         [pz1-L449A (zk)         h         ade6-M216 his3-D1 [pz1-L449A:::hphMX (zk restreaks)         h           56         TN14541         [pz1-L449A (zk)         h         ade6-M216 his3		1	1410026	ccq1-ELAG tpz1-[1-485]-mvc	$h^{-}$ his 3-D1 ccq1 <sup>+</sup> 5ELAG-kanMY6 to 21-212mvc-kanMY6
S         Sint 1233         Cold 11 L231         In this 20 Leq 11 St. L24 Mink to (p1 Finds 0, (00 Finds 0, (0		5	JH11203	ccq1-FLAG tpz1-[1-+03]-myc	$h^{-}$ his 3-D1 ccq1 <sup>+</sup> 5E AG-kanMX6 tp21-[1-763]1511yc-kanMX6
6         JH11772         ccq1-FLAG tpz1- W498R,I501R-myc poz1A         h* ade6-M216 his3-D1 ccq1*:5FLAG-kanMX6 tpz1-W498R,I501R::13myc- kanMX6 poz14::matMX6           S3A         1,5         TN6770         ccq1-FLAG tpz1- W498R,I501R-myc poz1A         h* his3-D1 ccq1*:5FLAG-kanMX6           S3A         1,5         TN6750         ccq1-FLAG tpz1-myc 4.8         h* his3-D1 ccq1*:5FLAG-kanMX6 tpz1-:13myc-kanMX6           S3B         1         TN14536         tpz1-L449A-myc         h* his3-D1 ccq1*:5FLAG-kanMX6 tpz1-L449A::13myc-kanMX6           S3B         1         TN14536         tpz1-L449A (zx)         h* his3-D1 ccq1*:5FLAG-kanMX6 tpz1-L449A::15myc-kanMX6           S3B         1         TN14536         tpz1-L449A (zx)         h* de6-M210/ade6-M210/ade6-M216 his3-D1/tpz1-L449A::tphMX           S3B         1         TN14536         tpz1-L449A (zx)         h* ade6-M216 his3-D1 tpz1-L449A::tphMX (Zx restreaks)           3         TN14577         tpz1-L449A (zx)         h* ade6-M216 his3-D1 tpz1-L449A::tphMX (Zx restreaks)           4         TN14540         tpz1-L449A (zx)         h* ade6-M216 his3-D1 tpz1-L449A::tphMX (Zx restreaks)           5         TN14551         tpz1-L449A (zx)         h* ade6-M216 his3-D1 tpz1-L449A::tphMX (Zx restreaks)           6         TN14581         tpz1-L449A (zx)         h* ade6-M216 his3-D1 tpz1-L449A::tphMX           10		0	01111200	W498R 1501R-mvc	
Similar         Widyabr, ISOTR-myc poz1A         In additional and the second se		6	JH11772	cca1-FLAG toz1-	h <sup>+</sup> ade6-M216 his3-D1 ccq1 <sup>+</sup> 5FI AG-kanMX6 tpz1-W498R I501R13mvc-
S3A       1,5       TN60/(B0111)       Rumme per laume       Rumme per laume         S3A       1,5       TN6770       cq1-FLAG (pz1-myc)       h* his3-D1 cq1*:SFLAG-kanMX6 (pz1-L449A::I:13myc-kanMX6         3,7       JH11174       cq1-FLAG (pz1-L449A, myc)       h* los3-D1 cq1*:SFLAG-kanMX6 (pz1-L449A::I:13myc-kanMX6         S3B       1       TN14536       (pz1*/(pz1-L449A, myc)       h* los3-D1 cq1*:SFLAG-kanMX6 (pz1-L449A::hphMX         2       TN14539       (pz1*/(pz1-L449A, (zx))       h* ade6-M216 his3-D1 lpz1-L449A::hphMX (2x restreaks)         3       TN14577       (pz1-L449A (zx))       h* ade6-M216 his3-D1 lpz1-L449A.:hphMX (2x restreaks)         4       TN14540       (pz1-L449A (zx))       h* ade6-M216 his3-D1 lpz1-L449A.:hphMX (2x restreaks)         5       TN14579       (pz1-L449A (zx))       h* ade6-M216 his3-D1 lpz1-L449A.:hphMX (2x restreaks)         6       TN14541       (pz1-L449A (zx))       h* ade6-M216 his3-D1 lpz1-L449A.:hphMX (2x restreaks)         7       TN14581       (pz1-L449A (zx))       h* ade6-M216 his3-D1 lpz1-L449A.:hphMX (2x restreaks)         8       TN14542       (pz1-L449A (zx))       h* ade6-M216 his3-D1 lpz1-L449A.:hphMX (2x restreaks)         9       TN14583       tpz1-L449A (zx)       h* ade6-M216 his3-D1 lpz1-L449A.:hphMX (2x restreaks)         10       TN14583       tpz1-L		0	01111772	W498R [501R-myc noz1A	kanMX6 poz1/natMX6
S3A       1,5       TN6770       ccq1-FLAG       h <sup>+</sup> his3-D1 ccq1 <sup>+</sup> ::5FLAG-kanMX6         3,7       JH1174       ccq1-FLAG [pz1-uvpc       h <sup>+</sup> his3-D1 ccq1 <sup>+</sup> ::5FLAG-kanMX6 [pz1 <sup>+</sup> :13myc-kanMX6         3,7       JH1174       ccq1-FLAG [pz1-L449A-myc       h <sup>+</sup> his3-D1 ccq1 <sup>+</sup> ::5FLAG-kanMX6 [pz1 <sup>+</sup> :13myc-kanMX6         4,8       JH12780       ccq1-FLAG [pz1-L449A-myc       h <sup>+</sup> his3-D1 ccq1 <sup>+</sup> ::5FLAG-kanMX6 [pz1 <sup>+</sup> :L449A::15myC-kanMX6         S3B       1       TN14536       tpz1 <sup>+</sup> /tpz1-L449A (px)       h <sup>+</sup> his3-D1 ccq1 <sup>+</sup> ::5FLAG-kanMX6 [pz1 <sup>+</sup> :L449A::hphMX         2       TN14536       tpz1 <sup>+</sup> /tpz1-L449A (px)       h <sup>+</sup> his3-D1 ccq1 <sup>+</sup> ::5FLAG-kanMX6 [pz1 <sup>+</sup> :L449A::hphMX         3       TN14536       tpz1 <sup>+</sup> /tpz1-L449A (px)       h <sup>+</sup> his3-D1 ccq1 <sup>+</sup> ::5FLAG-kanMX6 [pz1 <sup>+</sup> :L449A::hphMX         4       TN14530       tpz1 <sup>+</sup> L449A (px)       h <sup>+</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX (px restreaks)         5       TN14577       tpz1 <sup>-</sup> L449A (px)       h <sup>+</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX (px restreaks)         6       TN14581       tpz1 <sup>-</sup> L449A (px)       h <sup>+</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX (px restreaks)         7       TN14581       tpz1 <sup>-</sup> L449A (px)       h <sup>+</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX (px restreaks)         8       TN14580       tpz1 <sup>+</sup> + 449A (px)       h <sup>+</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX         7				W 1001,100 II ( III y 0 p 02 1/2	
2.6       TN7505       ccq1-FLAG tpz1-myc       h* his3-D1 ccq1"::5FLAG-kanMX6 tpz1"::13myc-kanMX6         3.7       JH11174       ccq1-FLAG tpz1-L449R-myc       h* ccq1"::5FLAG-kanMX6 tpz1-L449R         4.8       JH12780       ccq1-FLAG tpz1-L449A       h* his3-D1 ccq1"::5FLAG-kanMX6 tpz1-L449A         53B       1       TN14536       tpz1'/tpz1-L449A       h* his3-D1 tpz1-L449A         3       TN14571       tpz1-L449A       h* nis3-D1 tpz1-L449A       h* nis3-D1 tpz1-L449A         3       TN14577       tpz1-L449A       h* nis3-D1 tpz1-L449A       h* nis3-D1 tpz1-L449A         3       TN14577       tpz1-L449A       h* nis3-D1 tpz1-L449A       h* nis3-D1 tpz1-L449A         4       TN14579       tpz1-L449A       h* nis3-D1 tpz1-L449A       h* nis3-D1 tpz1-L449A         5       TN14579       tpz1-L449A (2x)       h* ade6-M216 his3-D1 tpz1-L449A       h* nis3-D1 tpz1-L449A         6       TN14541       tpz1-L449A (2x)       h* ade6-M216 his3-D1 tpz1-L449A       h* nis3-D1 tpz1-L449A       h* nis3-D1 tpz1-L449A       h* nis3-D1 tpz1-L449A       h* ade6-M216 his3-D1 tpz1-L449A       h* nis3-D1 tpz1-L449A       h* ade6-M216 his3-D1 tpz1-L449A <td< td=""><td>S3A</td><td>1.5</td><td>TN6770</td><td>cca1-FLAG</td><td>h<sup>+</sup> his3-D1 ccq1<sup>+</sup>∷5FLAG-kanMX6</td></td<>	S3A	1.5	TN6770	cca1-FLAG	h <sup>+</sup> his3-D1 ccq1 <sup>+</sup> ∷5FLAG-kanMX6
3,7       JH11174       ccq1-FLAG tp:1-1.449R-myc       h ccq1"::5FLAG-kanMX6 tp:1-1.449R::13myc-kanMX6         S3B       1       TN14536       tp:1'.tp:1-1.449A.myc       h is3-D1 ccq1"::5FLAG-kanMX6 tp:1-1.449A::13myc-kanMX6         S3B       1       TN14536       tp:1'.tp:1-1.449A (2x)       h ade6-M216 his3-D1 tp:1-1.449A::nphMX (2x restreaks)         3       TN14577       tp:1-1.449A (2x)       h ade6-M216 his3-D1 tp:1-1.449A::nphMX (2x restreaks)         4       TN14540       tp:1-1.449A (2x)       h ade6-M216 his3-D1 tp:1-1.449A::nphMX (2x restreaks)         5       TN14577       tp:1-1.449A (5x)       h ade6-M216 his3-D1 tp:1-1.449A::nphMX (2x restreaks)         6       TN14540       tp:1-1.449A (2x)       h ade6-M216 his3-D1 tp:1-1.449A::nphMX (2x restreaks)         7       TN14581       tp:1-1.449A (2x)       h ade6-M216 his3-D1 tp:1-1.449A::nphMX (5x restreaks)         8       TN14542       tp:1-1.449A (2x)       h ade6-M216 his3-D1 tp:1-1.449A::nphMX (5x restreaks)         9       TN14581       tp:1-1.449A (2x)       h ade6-M216 his3-D1 tp:1-1.449A::nphMX (5x restreaks)         10       TN14581       tp:1-1.449A (2x)       h ade6-M216 his3-D1 tp:1-1.449A::nphMX (5x restreaks)         8       TN14584       tp:1-1.449A       h ade6-M216 his3-D1 tp:1-1.449A::nphMX         8       TN14584       tp:1-1.449A		2.6	TN7505	cca1-FLAG toz1-myc	$h^{\dagger}$ his3-D1 ccg1 <sup>+</sup> 5ELAG-kanMX6 tpz1 <sup>+</sup> 13mvc-kanMX6
4,8       JH12780       ccq1-FLAG bp21-L449A.myc       h his3-D1 cq1*:5FLAG-kanMX6 tp21-L449A.::13myc-kanMX6         S3B       1       TN14536       tp21*/tp21-L449A       h*/h* ade6-M216 his3-D1 tp21*/t449A.::hp1MX (2x restreaks)         3       TN14539       tp21-L449A (2x)       h* ade6-M216 his3-D1 tp21-L449A.::hp1MX (5x restreaks)         4       TN14577       tp21-L449A (2x)       h* ade6-M216 his3-D1 tp21-L449A.::hp1MX (5x restreaks)         5       TN14579       tp21-L449A (2x)       h* ade6-M216 his3-D1 tp21-L449A.::hp1MX (5x restreaks)         5       TN14579       tp21-L449A (2x)       h* ade6-M216 his3-D1 tp21-L449A.::hp1MX (5x restreaks)         6       TN14511       tp21-L449A (2x)       h* ade6-M216 his3-D1 tp21-L449A.::hp1MX (5x restreaks)         7       TN14581       tp21-L449A (5x)       h* ade6-M216 his3-D1 tp21-L449A.::hp1MX (5x restreaks)         7       TN14581       tp21-L449A (5x)       h* ade6-M216 his3-D1 tp21-L449A.::hp1MX (5x restreaks)         8       TN14581       tp21-L449A (5x)       h* ade6-M216 his3-D1 tp21-L449A.::hp1MX (5x restreaks)         9       TN14583       tp21-L449A       h* ade6-M216 his3-D1 tp21-L449A.::hp1MX         10       TN11289       tp21*       h* his3-D1 tp21*::hp1MX         2       TN14578       tp21-L449A       h* ade6-M216 his3-D1 tp21-L449A.::hp1MX		37	JH11174	cca1-FLAG tpz1-L449R-mvc	h ccg1 <sup>+</sup> ··5FI AG-kanMX6 tpz1-I 449R··13mvc-kanMX6
S3B       1       TN14536       tpz1*/tpz1-L449A       h*/h* ade6-M210/ade6-M216 his3-D1/tpz1*/tpz1*/tpz1*/tpz1*/tpz1*.L449A:::hphMX         S3B       1       TN14539       tpz1*/t449A (2x)       h* ade6-M216 his3-D1 tpz1-L449A:::hphMX (2x restreaks)         3       TN14577       tpz1-L449A (2x)       h* ade6-M216 his3-D1 tpz1-L449A:::hphMX (5x restreaks)         4       TN14540       tpz1-L449A (2x)       h* ade6-M216 his3-D1 tpz1-L449A:::hphMX (5x restreaks)         5       TN14579       tpz1-L449A (2x)       h* ade6-M216 his3-D1 tpz1-L449A::hphMX (5x restreaks)         6       TN14581       tpz1-L449A (5x)       h* ade6-M216 his3-D1 tpz1-L449A::hphMX (5x restreaks)         7       TN14581       tpz1-L449A (5x)       h* ade6-M216 his3-D1 tpz1-L449A::hphMX (5x restreaks)         8       TN14524       tpz1-L449A (5x)       h* ade6-M216 his3-D1 tpz1-L449A::hphMX (5x restreaks)         9       TN14581       tpz1-L449A (5x)       h* ade6-M216 his3-D1 tpz1-L449A::hphMX (5x restreaks)         9       TN14581       tpz1-L449A (5x)       h* ade6-M216 his3-D1 tpz1-L449A::hphMX (5x restreaks)         9       TN14581       tpz1-L449A       h* ade6-M216 his3-D1 tpz1-L449A::hphMX (5x restreaks)         10       TN11289       tpz1*       h* ade6-M216 his3-D1 tpz1-L449A::hphMX         2       TN14585       tpz1/*       h* his3		4.8	JH12780	cca1-FLAG tpz1-L449A-mvc	$h^{-}$ his3-D1 ccq1 <sup>+</sup> 5FI AG-kanMX6 tpz1-I 449A13mvc-kanMX6
S3B       1       TN14536       tpz1*/tpz1-L449A       h*/h* ade6-M216 his3-D1 tpz1*/tpz1-L449A::hphMX         2       TN14539       tpz1-L449A (2x)       h* ade6-M216 his3-D1 tpz1-L449A::hphMX (2x restreaks)         3       TN14577       tpz1-L449A (2x)       h* ade6-M216 his3-D1 tpz1-L449A::hphMX (2x restreaks)         4       TN14540       tpz1-L449A (5x)       h* ade6-M216 his3-D1 tpz1-L449A::hphMX (2x restreaks)         5       TN14579       tpz1-L449A (5x)       h* ade6-M216 his3-D1 tpz1-L449A::hphMX (2x restreaks)         6       TN14541       tpz1-L449A (5x)       h* ade6-M216 his3-D1 tpz1-L449A::hphMX (2x restreaks)         6       TN14541       tpz1-L449A (5x)       h* ade6-M216 his3-D1 tpz1-L449A::hphMX (2x restreaks)         7       TN14581       tpz1-L449A (5x)       h* ade6-M216 his3-D1 tpz1-L449A::hphMX (2x restreaks)         8       TN14542       tpz1-L449A (5x)       h* ade6-M216 his3-D1 tpz1-L449A::hphMX (2x restreaks)         9       TN14581       tpz1-L449A (5x)       h* ade6-M216 his3-D1 tpz1-L449A::hphMX (2x restreaks)         10       TN11289       tpz1*       h* his3-D1 tpz1*:hphMX         2       TN14581       tpz1-L449A       h* ade6-M216 his3-D1 tpz1-L449A::hphMX         3       TN14582       tpz1-L449A       h* ade6-M216 his3-D1 tpz1-L449A::hphMX         4       <		.,.	0		
2         TN14539         tpz1-L449A (2x)         h <sup>2</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX (2x restreaks)           3         TN14577         tpz1-L449A (5x)         h <sup>2</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX (5x restreaks)           4         TN14540         tpz1-L449A (5x)         h <sup>2</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX (5x restreaks)           5         TN14577         tpz1-L449A (5x)         h <sup>2</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX (2x restreaks)           6         TN14541         tpz1-L449A (2x)         h <sup>2</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX (2x restreaks)           7         TN14581         tpz1-L449A (2x)         h <sup>2</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX (2x restreaks)           8         TN14542         tpz1-L449A (2x)         h <sup>2</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX (5x restreaks)           9         TN14583         tpz1-L449A (2x)         h <sup>2</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX (5x restreaks)           9         TN14583         tpz1-L449A (2x)         h <sup>2</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX (5x restreaks)           9         TN14583         tpz1-L449A (2x)         h <sup>2</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX (5x restreaks)           9         TN14584         tpz1-L449A (2x)         h <sup>2</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX           2         TN14580         tpz1-L449A         h <sup>2</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX           3         TN14580 <td>S3B</td> <td>1</td> <td>TN14536</td> <td>tpz1⁺/tpz1-L449A</td> <td>h<sup>+</sup>/h<sup>-</sup> ade6-M210/ade6-M216 his3-D1/his3-D1 tpz1<sup>+</sup>/tpz1-L449A::hphMX</td>	S3B	1	TN14536	tpz1⁺/tpz1-L449A	h <sup>+</sup> /h <sup>-</sup> ade6-M210/ade6-M216 his3-D1/his3-D1 tpz1 <sup>+</sup> /tpz1-L449A::hphMX
3       TN14577       tpz1-L449A (5x)       h ade6-M216 his3-D1 tpz1-L449A::hphMX (5x restreaks)         4       TN14540       tpz1-L449A (2x)       h ade6-M216 his3-D1 tpz1-L449A::hphMX (5x restreaks)         5       TN14579       tpz1-L449A (2x)       h ade6-M216 his3-D1 tpz1-L449A::hphMX (5x restreaks)         6       TN14511       tpz1-L449A (2x)       h ade6-M216 his3-D1 tpz1-L449A::hphMX (5x restreaks)         7       TN14581       tpz1-L449A (2x)       h ade6-M216 his3-D1 tpz1-L449A::hphMX (5x restreaks)         8       TN14542       tpz1-L449A (2x)       h ade6-M216 his3-D1 tpz1-L449A::hphMX (5x restreaks)         9       TN14581       tpz1-L449A (2x)       h ade6-M216 his3-D1 tpz1-L449A::hphMX (5x restreaks)         9       TN14581       tpz1-L449A (2x)       h ade6-M216 his3-D1 tpz1-L449A::hphMX (5x restreaks)         9       TN14581       tpz1-L449A (2x)       h ade6-M216 his3-D1 tpz1-L449A::hphMX (5x restreaks)         10       TN1289       tpz1*       h is3-D1 tpz1*         10       TN1289       tpz1*       h is3-D1 tpz1*         10       TN14580       tpz1-L449A       h ade6-M216 his3-D1 tpz1-L449A::hphMX         2       TN14580       tpz1-L449A       h ade6-M216 his3-D1 tpz1-L449A::hphMX         3       TN14580       tpz1-L449A       h ade6-M216 his3-D1 tpz1-L449A		2	TN14539	$t_{DZ}$ 1-L449A (2x)	h ade6-M216 his3-D1 tpz1-L449A::hphMX (2x restreaks)
4       TN14540       fpz1-L449A (2x)       h <sup>2</sup> ade6-M216 his3-D1 fpz1-L449A::hphMX (2x restreaks)         5       TN14579       tpz1-L449A (5x)       h <sup>2</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX (5x restreaks)         6       TN14541       tpz1-L449A (5x)       h <sup>2</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX (5x restreaks)         7       TN14581       tpz1-L449A (5x)       h <sup>2</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX (5x restreaks)         8       TN14542       tpz1-L449A (5x)       h <sup>2</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX (5x restreaks)         9       TN14583       tpz1-L449A (5x)       h <sup>2</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX (5x restreaks)         9       TN14583       tpz1-L449A (5x)       h <sup>2</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX (5x restreaks)         9       TN14583       tpz1-L449A (5x)       h <sup>2</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX (5x restreaks)         10       TN1289       tpz1 <sup>+</sup> h <sup>2</sup> ide6-M216 his3-D1 tpz1-L449A::hphMX         2       TN14578       tpz1-L449A       h <sup>2</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX         3       TN14580       tpz1-L449A       h <sup>2</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX         4       TN14578       tpz1-L449A       h <sup>2</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX         5       TN14578       tpz1-L449A       h <sup>2</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX         5       TN14578<		3	TN14577	tpz1-L449A (5x)	h ade6-M216 his3-D1 tpz1-L449A::hphMX (5x restreaks)
5       TN14579       tpz1-L449A (5x)       h ade6-M216 his3-D1 tpz1-L449A.::hphMX (5x restreaks)         6       TN14541       tpz1-L449A (5x)       h ade6-M216 his3-D1 tpz1-L449A.::hphMX (2x restreaks)         7       TN14581       tpz1-L449A (5x)       h ade6-M216 his3-D1 tpz1-L449A.::hphMX (5x restreaks)         8       TN14542       tpz1-L449A (5x)       h ade6-M216 his3-D1 tpz1-L449A.::hphMX (5x restreaks)         9       TN14583       tpz1-L449A (5x)       h ade6-M216 his3-D1 tpz1-L449A.::hphMX (5x restreaks)         9       TN14583       tpz1-L449A (5x)       h ade6-M216 his3-D1 tpz1-L449A.::hphMX (5x restreaks)         10       TN1289       tpz1*       h his3-D1 tpz1*::hphMX         S3C       1       TN1289       tpz1*       h his3-D1 tpz1*::hphMX         3       TN14580       tpz1-L449A       h ade6-M216 his3-D1 tpz1-L449A.::hphMX         3       TN14580       tpz1-L449A       h ade6-M216 his3-D1 tpz1-L449A.::hphMX         4       TN14582       tpz1-L449A       h ade6-M216 his3-D1 tpz1-L449A.::hphMX         5       TN14584       tpz1-L449A       h ade6-M216 his3-D1 tpz1-L449A.::hphMX         6       TN14584       tpz1-L449A       h ade6-M216 his3-D1 tpz1-L449A.::hphMX         7       TN14584       tpz1-L449A       h ade6-M216 his3-D1 tpz1-L449A.::hphMX		4	TN14540	tpz1-L449A (2x)	h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX (2x restreaks)
6         TN14541         tpz1-L449A (2x)         h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX (2x restreaks)           7         TN14581         tpz1-L449A (2x)         h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX (2x restreaks)           8         TN1452         tpz1-L449A (2x)         h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX (2x restreaks)           9         TN14583         tpz1-L449A (2x)         h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX (2x restreaks)           9         TN14583         tpz1-L449A (5x)         h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX (5x restreaks)           10         TN11289         tpz1 <sup>+</sup> h <sup>-</sup> his3-D1 tpz1 <sup>+</sup> ::hphMX           2         TN14578         tpz1-L449A         h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX           3         TN14580         tpz1-L449A         h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX           4         TN14581         tpz1-L449A         h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX           5         TN14584         tpz1-L449A         h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX           6		5	TN14579	$t_{DZ} = 1.1671 (2.0)$	h ade6-M216 his3-D1 tpz1-L449A::hphMX (5x restreaks)
7       TN14581       tp21-L449A (5x)       h ade6-M216 his3-D1 tp21-L449A.:hphMX (5x restreaks)         8       TN14542       tp21-L449A (2x)       h ade6-M216 his3-D1 tp21-L449A.:hphMX (5x restreaks)         9       TN14583       tp21-L449A (5x)       h ade6-M216 his3-D1 tp21-L449A.:hphMX (5x restreaks)         10       TN11289       tp21+       h his3-D1 tp21*::hphMX         S3C       1       TN11289       tp21+         2       TN14578       tp21-L449A       h ade6-M216 his3-D1 tp21+L449A::hphMX         3       TN14580       tp21-L449A       h ade6-M216 his3-D1 tp21+L449A::hphMX         3       TN14580       tp21-L449A       h ade6-M216 his3-D1 tp21+L449A::hphMX         4       TN14580       tp21-L449A       h ade6-M216 his3-D1 tp21-L449A::hphMX         5       TN14584       tp21-L449A       h ade6-M216 his3-D1 tp21-L449A::hphMX         4       TN14582       tp21-L449A       h ade6-M216 his3-D1 tp21-L449A::hphMX         5       TN14584       tp21-L449A       h ade6-M216 his3-D1 tp21-L449A::hphMX         5       TN14584       tp21-L449A       h ade6-M216 his3-D1 tp21-L449A::hphMX         5       TN14584       tp21-L449A       h ade6-M216 his3-D1 tp21-L449A::hphMX         6       TN14574       tp21-L449A       h ade6-M216 his		6	TN14541	$t_{DZ}$ 1-L449A (2x)	h ade6-M216 his3-D1 tpz1-L449A::hphMX (2x restreaks)
8         TN14542         tpz1-L449A (zx)         h ade6-M216 his3-D1 tpz1-L449A.::hphMX (2x restreaks)           9         TN14583         tpz1-L449A (5x)         h ade6-M216 his3-D1 tpz1-L449A.::hphMX (5x restreaks)           10         TN11289         tpz1*         h his3-D1 tpz1*::hphMX           S3C         1         TN14578         tpz1-L449A         h ade6-M216 his3-D1 tpz1-L449A::hphMX           3         TN14580         tpz1-L449A         h ade6-M216 his3-D1 tpz1-L449A::hphMX           4         TN14582         tpz1-L449A         h ade6-M216 his3-D1 tpz1-L449A::hphMX           5         TN14584         tpz1-L449A         h ade6-M216 his3-D1 tpz1-L449A::hphMX           5         TN14584         tpz1-L449A         h ade6-M216 his3-D1 tpz1-L449A::hphMX           6         TN14539         tpz1-L449A         h ade6-M216 his3-D1 tpz1-L449A::hphMX           7         TN14540         tpz1-L449A         h ade6-M216 his3-D1 tpz1-L449A::hphMX           8         TN14574         tpz1-L449A         h ade		7	TN14581	$t_{DZ}$ 1-L449A (5x)	h ade6-M216 his3-D1 tpz1-L449A::hphMX (5x restreaks)
9       TN14583       tp21-L449A (5x)       h ade6-M216 his3-D1 tp21-L449A.:hphMX (5x restreaks)         S3C       1       TN11289       tp21*       h his3-D1 tp21*::hphMX         S3C       1       TN11289       tp21*       h his3-D1 tp21*::hphMX         S3C       1       TN11289       tp21*       h his3-D1 tp21*::hphMX         S3C       1       TN14578       tp21-L449A       h ade6-M216 his3-D1 tp21-L449A.::hphMX         3       TN14580       tp21-L449A       h ade6-M216 his3-D1 tp21-L449A.::hphMX         4       TN14582       tp21-L449A       h ade6-M216 his3-D1 tp21-L449A.::hphMX         5       TN14584       tp21-L449A       h ade6-M216 his3-D1 tp21-L449A.::hphMX         5       TN14584       tp21-L449A       h ade6-M216 his3-D1 tp21-L449A.::hphMX         5       TN14584       tp21-L449A       h ade6-M216 his3-D1 tp21-L449A.::hphMX         6       TN14539       tp21-L449A       h ade6-M216 his3-D1 tp21-L449A.::hphMX         5       TN14540       tp21-L449A       h ade6-M216 his3-D1 tp21-L449A.::hphMX         6       TN14574       tp21-L449A po21A       h ade6-M216 his3-D1 tp21-L449A.::hphMX         7       TN14576       tp21-L449A po21A       h ade6-M216 his3-D1 tp21-L449A.::hphMX po21A.::natMX6         6		8	TN14542	$t_{DZ}$ 1-L449A (2x)	h ade6-M216 his3-D1 tpz1-L449A::hphMX (2x restreaks)
10 $TN11289$ $tpz1^*$ $h^* his3-D1 tpz1^*::hphMX$ S3C1 $TN11289$ $tpz1^*$ $h^* his3-D1 tpz1^*::hphMX$ S3C1 $TN14589$ $tpz1^*$ $h^* his3-D1 tpz1^*::hphMX$ 2 $TN14578$ $tpz1-L449A$ $h^* ade6-M216 his3-D1 tpz1-L449A::hphMX$ 3 $TN14580$ $tpz1-L449A$ $h^* ade6-M216 his3-D1 tpz1-L449A::hphMX$ 4 $TN14582$ $tpz1-L449A$ $h^* ade6-M216 his3-D1 tpz1-L449A::hphMX$ 5 $TN14584$ $tpz1-L449A$ $h^* ade6-M216 his3-D1 tpz1-L449A::hphMX$ 5 $TN14584$ $tpz1-L449A$ $h^* ade6-M216 his3-D1 tpz1-L449A::hphMX$ S3D1,12 $TN11289$ $tpz1^*$ $A^*$ $h^* ade6-M216 his3-D1 tpz1-L449A::hphMX$ 2 $JH12909$ $poz1\Delta$ 3 $TN14539$ $tpz1-L449A$ 4 $TN14539$ $tpz1-L449A$ 5 $TN14539$ $tpz1-L449A$ 4 $TN14540$ $tpz1-L449A$ 5 $TN14574$ $tpz1-L449A$ poz1 $\Delta$ 4 $TN14576$ $tpz1-L449A$ poz1 $\Delta$ 6 $TN14575$ $tpz1-L449A$ poz1 $\Delta$ 7 $TN14576$ $tpz1-L449A$ poz1 $\Delta$ 8 $JH11577$ $tpz1-L449R$ poz1 $\Delta$ 9 $TN144445$ $tpz1-$		9	TN14583	$t_{DZ}$ 1-L449A (5x)	h ade6-M216 his3-D1 tpz1-L449A::hphMX (5x restreaks)
S3C       1       TN11289       tpz1*       h^ his3-D1 tpz1*::hphMX         2       TN14578       tpz1-L449A       h^ ade6-M216 his3-D1 tpz1-L449A::hphMX         3       TN14580       tpz1-L449A       h^ ade6-M216 his3-D1 tpz1-L449A::hphMX         4       TN14582       tpz1-L449A       h^ ade6-M216 his3-D1 tpz1-L449A::hphMX         5       TN14584       tpz1-L449A       h^ ade6-M216 his3-D1 tpz1-L449A::hphMX         5       TN14584       tpz1-L449A       h^ ade6-M216 his3-D1 tpz1-L449A::hphMX         S3D       1,12       TN11289       tpz1*         7       TN14539       tpz1-L449A       h^ ade6-M216 his3-D1 tpz1-L449A::hphMX         4       TN14539       tpz1-L449A       h^ ade6-M216 his3-D1 tpz1-L449A::hphMX         5       TN14539       tpz1-L449A       h^ ade6-M216 his3-D1 tpz1-L449A::hphMX         4       TN14540       tpz1-L449A       h^ ade6-M216 his3-D1 tpz1-L449A::hphMX         5       TN14574       tpz1-L449A poz1A       h^ ade6-M216 his3-D1 tpz1-L449A::hphMX         6       TN14575       tpz1-L449A poz1A       h^ ade6-M216 his3-D1 tpz1-L449A::hphMX poz1A::natMX6         7       TN14576       tpz1-L449A poz1A       h^ ade6-M216 his3-D1 tpz1-L449A::hphMX poz1A::natMX6         8       JH11577       tpz1-L449A poz1A <td></td> <td>10</td> <td>TN11289</td> <td><math>tpz1^+</math></td> <td><math>h^{-}</math> his3-D1 tpz1<sup>+</sup>::hphMX</td>		10	TN11289	$tpz1^+$	$h^{-}$ his3-D1 tpz1 <sup>+</sup> ::hphMX
S3C       1       TN11289 $tpz1^+$ h <sup>+</sup> his3-D1 tpz1 <sup>+</sup> ::hphMX         2       TN14578 $tpz1-L449A$ h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX         3       TN14580 $tpz1-L449A$ h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX         4       TN14582 $tpz1-L449A$ h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX         5       TN14584 $tpz1-L449A$ h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX         5       TN14584 $tpz1-L449A$ h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX         S3D       1,12       TN1289 $tpz1^+$ h <sup>-</sup> his3-D1 tpz1 <sup>+</sup> ::hphMX         2       JH12999 $poz1\Delta$ h <sup>-</sup> ade6-M216 his3-D1 poz1\Delta::natMX6         3       TN14539 $tpz1-L449A$ h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX         4       TN14540 $tpz1-L449A$ h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX         5       TN14574 $tpz1-L449A$ poz1 $\Delta$ h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX poz1 $\Delta$ ::natMX6         6       TN14575 $tpz1-L449A$ poz1 $\Delta$ h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX poz1 $\Delta$ ::natMX6         7       TN14576 $tpz1-L449A$ poz1 $\Delta$ h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX poz1 $\Delta$ ::natMX6         8       JH11577 $tpz1-L449A$ poz1 $\Delta$ h <sup>-</sup> ade6-				1	Tr F
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	S3C	1	TN11289	tpz1 <sup>+</sup>	h⁻ his3-D1 tpz1⁺::hphMX
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		2	TN14578	tpz1-L449A	h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX
4TN14582 $tpz1-L449A$ h° ade6-M216 his3-D1 $tpz1-L449A$ ::hphMX5TN14584 $tpz1-L449A$ h° ade6-M216 his3-D1 $tpz1-L449A$ ::hphMXS3D1,12TN11289 $tpz1^+$ h° his3-D1 $tpz1^+$ ::hphMX2JH12999 $poz1\Delta$ h° ade6-M216 his3-D1 $poz1\Delta$ ::natMX63TN14539 $tpz1-L449A$ h° ade6-M216 his3-D1 $tpz1-L449A$ ::hphMX4TN14540 $tpz1-L449A$ h° ade6-M216 his3-D1 $tpz1-L449A$ ::hphMX5TN14574 $tpz1-L449A$ h° ade6-M216 his3-D1 $tpz1-L449A$ ::hphMX6TN14575 $tpz1-L449A$ poz1 $\Delta$ h° ade6-M216 his3-D1 $tpz1-L449A$ ::hphMX poz1 $\Delta$ ::natMX67TN14576 $tpz1-L449A$ poz1 $\Delta$ h° ade6-M216 his3-D1 $tpz1-L449A$ ::hphMX poz1 $\Delta$ ::natMX68JH11577 $tpz1-L449A$ poz1 $\Delta$ h° ade6-M216 his3-D1 $tpz1-L449A$ ::hphMX9TN14444 $tpz1-L449R$ poz1 $\Delta$ h° ade6-M216 his3-D1 $tpz1-L449R$ ::hphMX10TN14445 $tpz1-L449R$ poz1 $\Delta$ h° is3-D1 $tpz1-L449R$ ::hphMX poz1 $\Delta$ ::natMX6		3	TN14580	tpz1-L449A	h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX
5TN14584 $tpz1-L449A$ $h^{-}ade6-M216 his3-D1 tpz1-L449A::hphMX$ S3D1,12TN11289 $tpz1^{+}$ $h^{-}his3-D1 tpz1^{+}::hphMX$ 2JH12999 $poz1\Delta$ $h^{-}ade6-M216 his3-D1 poz1\Delta::natMX6$ 3TN14539 $tpz1-L449A$ $h^{-}ade6-M216 his3-D1 tpz1-L449A::hphMX$ 4TN14540 $tpz1-L449A$ $h^{-}ade6-M216 his3-D1 tpz1-L449A::hphMX$ 5TN14574 $tpz1-L449A$ poz1 $\Delta$ $h^{-}ade6-M216 his3-D1 tpz1-L449A::hphMX poz1\Delta::natMX66TN14575tpz1-L449A poz1\Deltah^{-}ade6-M216 his3-D1 tpz1-L449A::hphMX poz1\Delta::natMX67TN14576tpz1-L449A poz1\Deltah^{-}ade6-M216 his3-D1 tpz1-L449A::hphMX poz1\Delta::natMX68JH11577tpz1-L449A poz1\Deltah^{-}ade6-M216 his3-D1 tpz1-L449R::hphMX9TN14444tpz1-L449R poz1\Deltah^{-}iade6-M216 his3-D1 tpz1-L449R::hphMX10TN14445tpz1-L449R poz1\Deltah^{-}iade6-M216 his3-D1 tpz1-L449R::hphMX poz1\Delta::natMX6$		4	TN14582	tpz1-L449A	h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX
S3D1,12TN11289 $tpz1^+$ $h^- his3-D1 tpz1^+::hphMX$ 2JH12999 $poz1\Delta$ $h^- ade6-M216 his3-D1 poz1\Delta::natMX6$ 3TN14539 $tpz1-L449A$ $h^- ade6-M216 his3-D1 tpz1-L449A::hphMX$ 4TN14540 $tpz1-L449A$ $h^- ade6-M216 his3-D1 tpz1-L449A::hphMX$ 5TN14574 $tpz1-L449A$ poz1 $\Delta$ $h^- ade6-M216 his3-D1 tpz1-L449A::hphMX poz1\Delta::natMX66TN14575tpz1-L449A poz1\Deltah^- ade6-M216 his3-D1 tpz1-L449A::hphMX poz1\Delta::natMX67TN14576tpz1-L449A poz1\Deltah^- ade6-M216 his3-D1 tpz1-L449A::hphMX poz1\Delta::natMX68JH11577tpz1-L449Rh^- ade6-M216 his3-D1 tpz1-L449R::hphMX9TN14444tpz1-L449R poz1\Deltah^- his3-D1 tpz1-L449R::hphMX poz1\Delta::natMX610TN14445tpz1-L449R poz1\Deltah^- his3-D1 tpz1-L449R::hphMX poz1\Delta::natMX6$		5	TN14584	tpz1-L449A	h ade6-M216 his3-D1 tpz1-L449A::hphMX
S3D       1,12       TN11289       tpz1 <sup>+</sup> h <sup>-</sup> his3-D1 tpz1 <sup>+</sup> ::hphMX         2       JH12999       poz1A       h <sup>-</sup> ade6-M216 his3-D1 poz1A::natMX6         3       TN14539       tpz1-L449A       h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX         4       TN14540       tpz1-L449A       h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX         5       TN14574       tpz1-L449A poz1A       h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX poz1A::natMX6         6       TN14575       tpz1-L449A poz1A       h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX poz1A::natMX6         7       TN14576       tpz1-L449A poz1A       h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX poz1A::natMX6         8       JH11577       tpz1-L449A poz1A       h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449R::hphMX         9       TN14444       tpz1-L449R poz1A       h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449R::hphMX         9       TN14444       tpz1-L449R poz1A       h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449R::hphMX         9       TN14444       tpz1-L449R poz1A       h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449R::hphMX         10       TN14445       tpz1-L449R poz1A       h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449R::hphMX poz1A::natMX6					
2 $JH12999$ $poz1\Delta$ $h^{-}ade6-M216 his3-D1 poz1\Delta::natMX6$ 3 $TN14539$ $tpz1-L449A$ $h^{-}ade6-M216 his3-D1 tpz1-L449A::hphMX$ 4 $TN14540$ $tpz1-L449A$ $h^{-}ade6-M216 his3-D1 tpz1-L449A::hphMX$ 5 $TN14574$ $tpz1-L449A poz1\Delta$ $h^{-}ade6-M216 his3-D1 tpz1-L449A::hphMX poz1\Delta::natMX6$ 6 $TN14575$ $tpz1-L449A poz1\Delta$ $h^{-}ade6-M216 his3-D1 tpz1-L449A::hphMX poz1\Delta::natMX6$ 7 $TN14576$ $tpz1-L449A poz1\Delta$ $h^{-}ade6-M216 his3-D1 tpz1-L449A::hphMX poz1\Delta::natMX6$ 8 $JH11577$ $tpz1-L449R$ $h^{-}ade6-M216 his3-D1 tpz1-L449R::hphMX$ 9 $TN14444$ $tpz1-L449R poz1\Delta$ $h^{-}his3-D1 tpz1-L449R::hphMX poz1\Delta::natMX6$ 10 $TN14445$ $tpz1-L449R poz1\Delta$ $h^{-}ade6-M216 his3-D1 tpz1-L449R::hphMX poz1\Delta::natMX6$	S3D	1,12	TN11289	tpz1⁺	h <sup>-</sup> his3-D1 tpz1 <sup>+</sup> ::hphMX
3       TN14539 $tpz1-L449A$ $h^{-}$ ade6-M216 his3-D1 $tpz1-L449A$ ::hphMX         4       TN14540 $tpz1-L449A$ $h^{-}$ ade6-M216 his3-D1 $tpz1-L449A$ ::hphMX         5       TN14574 $tpz1-L449A$ poz1 $\Delta$ $h^{-}$ ade6-M216 his3-D1 $tpz1-L449A$ ::hphMX poz1 $\Delta$ ::natMX6         6       TN14575 $tpz1-L449A$ poz1 $\Delta$ $h^{-}$ ade6-M216 his3-D1 $tpz1-L449A$ ::hphMX poz1 $\Delta$ ::natMX6         7       TN14576 $tpz1-L449A$ poz1 $\Delta$ $h^{-}$ ade6-M216 his3-D1 $tpz1-L449A$ ::hphMX poz1 $\Delta$ ::natMX6         8       JH11577 $tpz1-L449R$ poz1 $\Delta$ $h^{-}$ ade6-M216 his3-D1 $tpz1-L449R$ ::hphMX         9       TN14444 $tpz1-L449R$ poz1 $\Delta$ $h^{-}$ ade6-M216 his3-D1 $tpz1-L449R$ ::hphMX         9       TN14444 $tpz1-L449R$ poz1 $\Delta$ $h^{-}$ ade6-M216 his3-D1 $tpz1-L449R$ ::hphMX         10       TN14445 $tpz1-L449R$ poz1 $\Delta$ $h^{-}$ ade6-M216 his3-D1 $tpz1-L449R$ ::hphMX poz1 $\Delta$ ::natMX6		2	JH12999	poz1A	h <sup>-</sup> ade6-M216 his3-D1 poz1∆∷natMX6
4       TN14540       tpz1-L449A       h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX         5       TN14574       tpz1-L449A poz1A       h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX poz1A::natMX6         6       TN14575       tpz1-L449A poz1A       h <sup>+</sup> his3-D1 tpz1-L449A::hphMX poz1A::natMX6         7       TN14576       tpz1-L449A poz1A       h <sup>+</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX poz1A::natMX6         8       JH11577       tpz1-L449R       h <sup>+</sup> ade6-M216 his3-D1 tpz1-L449R::hphMX         9       TN14444       tpz1-L449R poz1A       h <sup>+</sup> his3-D1 tpz1-L449R::hphMX poz1A::natMX6         10       TN14445       tpz1-L449R poz1A       h <sup>+</sup> ade6-M216 his3-D1 tpz1-L449R::hphMX poz1A::natMX6		3	TN14539	tpz1-L449A	h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX
5 $TN14574$ $tpz1-L449A$ $poz1\Delta$ $h^{-}$ ade6-M216 his3-D1 $tpz1-L449A$ ::hphMX $poz1\Delta$ ::natMX6         6 $TN14575$ $tpz1-L449A$ $poz1\Delta$ $h^{+}$ his3-D1 $tpz1-L449A$ ::hphMX $poz1\Delta$ ::natMX6         7 $TN14576$ $tpz1-L449A$ $poz1\Delta$ $h^{-}$ ade6-M216 his3-D1 $tpz1-L449A$ ::hphMX $poz1\Delta$ ::natMX6         8       JH11577 $tpz1-L449R$ $h^{-}$ ade6-M216 his3-D1 $tpz1-L449R$ ::hphMX         9 $TN14444$ $tpz1-L449R$ $poz1\Delta$ $h^{-}$ his3-D1 $tpz1-L449R$ ::hphMX $poz1\Delta$ ::natMX6         10 $TN14445$ $tpz1-L449R$ $poz1\Delta$ $h^{+}$ ade6-M216 his3-D1 $tpz1-L449R$ ::hphMX $poz1\Delta$ ::natMX6		4	TN14540	tpz1-L449A	h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX
6       TN14575       tpz1-L449A poz1∆       h <sup>+</sup> his3-D1 tpz1-L449A::hphMX poz1∆::natMX6         7       TN14576       tpz1-L449A poz1∆       h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449A::hphMX poz1∆::natMX6         8       JH11577       tpz1-L449R       h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449R::hphMX         9       TN14444       tpz1-L449R poz1∆       h <sup>-</sup> his3-D1 tpz1-L449R::hphMX poz1∆::natMX6         10       TN14445       tpz1-L449R poz1∆       h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449R::hphMX poz1∆::natMX6		5	TN14574	tpz1-L449A poz1∆	h <sup>-</sup> ade6-M216 his3-D1 tpz1-L449A∷hphMX poz1∆∷natMX6
7       TN14576 $tpz1-L449A$ poz1 $\Delta$ $h^{-}$ ade6-M216 his3-D1 tpz1-L449A::hphMX poz1 $\Delta$ ::natMX6         8       JH11577 $tpz1-L449R$ $h^{+}$ ade6-M216 his3-D1 tpz1-L449R::hphMX         9       TN14444 $tpz1-L449R$ poz1 $\Delta$ $h^{-}$ his3-D1 tpz1-L449R::hphMX poz1 $\Delta$ ::natMX6         10       TN14445 $tpz1-L449R$ poz1 $\Delta$ $h^{+}$ ade6-M216 his3-D1 tpz1-L449R::hphMX poz1 $\Delta$ ::natMX6		6	TN14575	tpz1-L449A poz1∆	h <sup>⁺</sup> his3-D1 tpz1-L449A::hphMX poz1∆::natMX6
8       JH11577       tpz1-L449R       h <sup>+</sup> ade6-M216 his3-D1 tpz1-L449R::hphMX         9       TN14444       tpz1-L449R poz1∆       h <sup>-</sup> his3-D1 tpz1-L449R::hphMX poz1∆::natMX6         10       TN14445       tpz1-L 449R poz1∆       h <sup>+</sup> ade6-M216 his3-D1 tpz1-L 449R::hphMX poz1∆::natMX6		7	TN14576	tpz1-L449A poz1∆	h⁻ ade6-M216 his3-D1 tpz1-L449A::hphMX poz1∆::natMX6
9 TN14444 $tpz1-L449R$ $poz1\Delta$ $h^{-}$ his3-D1 $tpz1-L449R$ ::hphMX $poz1\Delta$ ::natMX6 10 TN14445 $tpz1-L449R$ $poz1\Delta$ $h^{+}$ ade6-M216 his3-D1 $tpz1-L449R$ ::hphMX $poz1\Delta$ ::natMX6		8	JH11577	tpz1-L449R	h <sup>⁺</sup> ade6-M216 his3-D1 tpz1-L449R::hphMX
10 TN14445 $t_{0,1}$ TN14445 $t_{0,2}$ TN14445 $t_{0,1}$ TN14445 $t_{0,2}$ TN1445 $t_{0,2}$ TN145 $t_{0,2}$ TN145 $t_{0,2}$ TN1445 $t_{0,2}$ TN145 $t_{0,2}$ TN145 $t_{0,2}$ TN145 $t_{0,2}$ TN145 $t_{0,2}$ TN145 $t_{0,2}$ TN14445 $t_{0,2}$ TN145 $t_{0,2}$ TN155 $t_{0,2}$ TN145 $t_{$		9	TN14444	tpz1-L449R poz1∆	h <sup>-</sup> his3-D1 tpz1-L449R::hphMX poz1∆::natMX6
		10	TN14445	$tpz1-L449R$ $poz1\Delta$	h <sup>+</sup> ade6-M216 his3-D1 tpz1-L449R::hphMX poz1∆::natMX6
11 TN14446 $tpz1-L449R$ $poz1\Delta$ $h^{\dagger}$ ade6-M216 his3-D1 $tpz1-L449R$ ::hphMX $poz1\Delta$ ::natMX6		11	TN14446	$tpz1-L449R$ $poz1\Delta$	h <sup>+</sup> ade6-M216 his3-D1 tpz1-L449R::hphMX poz1∆::natMX6
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S3E 1 TN11289 $tpz1^+$ $h^-his3-D1 tpz1^+::hphMX$	S3E	1	TN11289	tpz1⁺	h <sup>-</sup> his3-D1 tpz1 <sup>+</sup> ::hphMX
2 TN14539 tpz1-L449A h ade6-M216 his3-D1 tpz1-L449A::hphMX		2	TN14539	tpz1-L449A	h ade6-M216 his3-D1 tpz1-L449A::hphMX
3 TN14540 tpz1-L449A h ade6-M216 his3-D1 tpz1-L449A::hphMX		3	TN14540	tpz1-L449A	h_ade6-M216 his3-D1 tpz1-L449A::hphMX
4 TN14574 tpz1-L449A poz1 $\Delta$ h ade6-M216 his3-D1 tpz1-L449A::hphMX poz1 $\Delta$ ::natMX6		4	TN14574	tpz1-L449A poz1 $\Delta$	h_ade6-M216 his3-D1 tpz1-L449A::hphMX poz1∆::natMX6
5 TN14575 tpz1-L449A poz1 $\Delta$ h <sup>+</sup> his3-D1 tpz1-L449A::hphMX poz1 $\Delta$ ::natMX6		5	TN14575	tpz1-L449A poz1∆	h⁺ his3-D1 tpz1-L449A::hphMX poz1⊿::natMX6
6 TN14576 tpz1-L449A poz1 $\Delta$ h ade6-M216 his3-D1 tpz1-L449A hnhMX noz1 $\Lambda$ natMX6		6	TN14576	tpz1-L449Α poz1Λ	h_ade6-M216 his3-D1 tpz1-L449A::hphMX poz1A::natMX6
7 JH11577 $tpz1-L449R$ $h^+$ ade6-M216 his3-D1 $tpz1-L449R$ · hphMX		7	JH11577	tpz1-L449R	$h^{\dagger}$ ade6-M216 his3-D1 tpz1-L449R::hphMX
8 TN14444 $tpz1-L449R$ $poz1\Lambda$ h his3-D1 $tpz1-L449R$ · hphMX $poz1\Lambda$ inatMX6		8	TN14444	tpz1-L449R poz1A	h his3-D1 tpz1-L449R::hphMX poz1A::natMX6
9 TN14445 $t_{pz1}$ L 449R $t_{pz1}$ h <sup>+</sup> ade6-M216 his3-D1 $t_{pz1}$ L 449R $t_{pz1}$ A $t_{pz1}$ L 449R $t_{pz1}$ A $t_{pz1}$		9	TN14445	$t_{D}$ tpz1-L 449R noz1A	$h^{\dagger}$ ade6-M216 his3-D1 tpz1-I 449R··hphMX poz1A··patMX6
10 TN14446 $t_{pz1-l}$ 449R $t_{pz1-l}$ $h^+$ ade6-M216 his3-D1 $t_{pz1-l}$ 449R $t_{pz1-l}$ $h^+$ ade6-M216 his3-D1 $t_{pz1-l}$ 449R $t_{pz1-l}$ $h^+$ ade6-M216 his3-D1 $t_{pz1-l}$ 449R $t_{pz1-l}$ $h^+$		- 10	TN14446	tpz1-L 449R poz1A	$h^{\dagger}$ ade6-M216 his3-D1 tpz1-L449R··hphMX poz1A··natMX6

Figure		Strain		Full Genotype <sup>a</sup>
S4	1	TN2411	tpz1 <sup>+</sup>	h <sup>°</sup> his3-D1
	2,14,15	TN7196	tpz1-myc	h <sup>-</sup> his3-D1 tpz1 <sup>+</sup> ::13myc-kanMX6
	3-6	JH11181	tpz1-L449R-myc	h ade6-M216 tpz1-L449R::13myc-kanMX6 (multiple 11x restreak single colonies derived from JH11181)
	7,16,23	LK8667	ccq1A	h his3-D1 ccq1∆::hphMX
	8-13	JH11218	tpz1-Y439R,L445R-myc	<i>h</i> <sup>+</sup> ade6-M210 his3-D1 tpz1-Y439R,L445R::13myc-kanMX6 (multiple 11x restreak single colonies derived from JH11218)
	17-22	JH11232	tpz1-Y439R,L445R,L449R- myc	h <sup>+</sup> ade6-M210 his3-D1 tpz1-Y439R,L445R,L449R::13myc-kanMX6 (multiple 11x restreak single colonies derived from JH11232)
S5		CF248	$trt1^{+}/trt1\Delta$	h <sup>+</sup> /h <sup>-</sup> ade6-M210/ade6-M216 his3-D1/his3-D1 trt1 <sup>+</sup> /trt1∆::his3 <sup>+</sup>
		JH12700		ccq1 <sup>*</sup> /ccq1Δ::hphMX
		JH12263	trt1⁺/trt1∆ tpz1⁺/tpz1-L449R	h⁺/h⁻ ade6-M210/ade6-M216 his3-D1/his3-D1 trt1*/trt1∆::his3* tpz1*/tpz1- L449R::hphMX
S6A		CF199	wt	h <sup>-</sup> ade6-M210 his3-D1
		TN6584	ccq1A	h ade6-M210 his3-D1 ccq1∆::hphMX
		JH11578	tpz1-L449R	h ade6-M216 his3-D1 tpz1-L449R::hphMX
		JH11423 JH11574	tpz1-Y439R,L445R tpz1-Y439R,L445R,L449R	h_ade6-M210 his3-D1 tpz1-Y439R,L445R::hphMX h <sup>-</sup> ade6-M210 his3-D1 tpz1-Y439R,L445R,L449R::hphMX
S6B	1,2	JH11722	chk1-myc	h <sup>-</sup> ade6-M216 his3-D1 chk1 <sup>+</sup> ::9myc-2HA-6his-ura4 <sup>+</sup> tpz1 <sup>+</sup> ::hphMX
	3	JH11724	chk1-mvc cca1 $\Delta$	$h^{\dagger}$ his3-D1 chk1 <sup>+</sup> ::9mvc-2HA-6his-ura4 <sup>+</sup> tpz1 <sup>+</sup> ::hphMX ccq1 $\Delta$ ::hphMX
	4	JH11636	chk1-myc tpz1-L449R	h <sup>-</sup> ade6-M216 his3-D1 chk1 <sup>+</sup> ::9myc-2HA-6his-ura4 <sup>+</sup> tpz1-L449R::hphMX
	5	JH11638	chk1-myc tpz1-Y439R,L445R	h <sup>*</sup> ade6-M216 his3-D1 chk1 <sup>+</sup> ::9myc-2HA-6his-ura4 <sup>+</sup> tpz1-Y439R,L445R::hphMX
	6	JH11640	chk1-myc tpz1- Y439R,L445R,L449R	h <sup>+</sup> ade6-M216 his3-D1 chk1 <sup>+</sup> ::9myc-2HA-6his-ura4 <sup>+</sup> tpz1- Y439R,L445R,L449R::hphMX
S7A	1	TN2411	his	h <sup>°</sup> his3-D1
	2	TN3784	his⁺	
	3	CF52	telomere (1L)::his3	h <sup>30</sup> ura4-DS/E ade6-M210 his3-D1 his3 :::tel(1L)
	4	TN9133	telomere (1L):: $his3 \ ccq1\Delta$	n his3-D1 ccq1A::npnMX his3 ::tel(1L)
	5	TN9630	L449R	n adeo-m216 nis3-D1 tp21-L449R::13myc-kanmx6 nis3 ::tel(1L)
	6	TN9623	telomere (1L)::his3' tpz1- Y439R,L445R	h_ade6-M210 his3-D1 tpz1-Y439R,L445R::13myc-kanMX6 his3`::tel(1L)
S7B	1	TN2411	his	h <sup>°</sup> his3-D1
	2	TN3784	his⁺	h <sup>-</sup>
	3	CF52	telomere (1L)::his3	h <sup>3°</sup> ura4-DS/E ade6-M210 his3-D1 his3 :::tel(1L)
	4 5	TN9607 TN9614	telomere (1L):: $his3^{+}$ tpz1-	n_ade6-M210 his3-D1 poz1∆::natMX6 his3 ::tel(1L) h <sup>+</sup> ade6-M210 his3-D1 tpz1-W498R,I501R::13myc-kanMX6 his3 <sup>+</sup> ::tel(1L)
	6	TN9618	W498R,I501R telomere (1L)::his3 <sup>+</sup> tpz1-[1-	h <sup>+</sup> ade6-M210 his3-D1 tpz1-[1-485]::13myc-kanMX6 his3 <sup>+</sup> ::tel(1L)
			485]	
S8A	1	TN6770	cca1-FLAG	h <sup>+</sup> his3-D1 ccɑ1 <sup>+</sup> ::5FLAG-kanMX6
	2	TN10988	$trt1_{\Delta}$ ccg1-FLAG	h <sup>*</sup> ade6-M210 his3-D1 trt1 <u>A</u> ::his3 <sup>+</sup> ccq1 <sup>+</sup> ::5FLAG-kanMX6
	3	TN10991	trt1∆ ccq1-T93A-FLAG	h <sup>*</sup> ade6-M210 his3-D1 trt1∆::his3 <sup>*</sup> ccg1-T93A::5FLAG-kanMX6
	4	JH11174	ccq1-FLAG tpz1-L449R-myc	h⁻ ccq1 <sup>+</sup> ::5FLAG-kanMX6 tpz1-L449R::13myc-kanMX6
	5	JH11238	ccq1-FLAG tpz1- Y439R I 445R-mvc	h <sup>-</sup> his3-D1 ccq1 <sup>+</sup> ::5FLAG-kanMX6 tpz1-Y439R,L445R::13myc-kanMX6
	6	JH11248	ccq1-FLAG tpz1- Y439R,L445R,L449R-myc	h <sup>+</sup> his3-D1 ccq1 <sup>+</sup> ::5FLAG-kanMX6 tpz1-Y439R,L445R,L449R-13myc-kanMX6
S8B	1	JH11289	<i>ccq1</i> ⁺ (no tag)	h⁻ his3-D1 tpz1⁺::hphMX
	2	JH11569	ccq1-myc	h <sup>+</sup> his3-D1 ccq1 <sup>+</sup> ::13myc-kanMX6 tpz1 <sup>+</sup> ::hphMX
	3	JH11622	ccq1-myc tpz1-L449R	h <sup>+</sup> his3-D1 ccq1 <sup>+</sup> ::13myc-kanMX6 tpz1-L449R::hphMX
	4	JH11452	ccq1-myc tpz1-Y439R,L445R	h <sup>+</sup> his3-D1 ccq1 <sup>+</sup> ::13myc-kanMX6 tpz1-Y439R,L445R::hphMX
	5	JH11609	ccq1-myc tpz1- Y439R,L445R,L449R	h` his3-D1 ccq1`::13myc-kanMX6 tpz1-Y439R,L445R,L449R::hphMX

Figure		Strain		Full Genotype <sup>a</sup>
S8C	1	JH11289	<i>trt1</i> ⁺ (no tag)	h his3-D1 tpz1 <sup>+</sup> ::hphMX
	2	JH11630	trt1-myc	h ade6-M216 his3-D1 trt1⁺::G₀-13myc-kanMX6 tpz1⁺::hphMX
	3	JH11626	trt1-myc tpz1-L449R	h ade6-M216 his3-D1 trt1 <sup>+</sup> ::G <sub>8</sub> -13myc-kanMX6 tpz1-L449R::hphMX
	4	JH11449	trt1-myc tpz1-Y439R,L445R	h <sup>+</sup> ade6-M210 his3-D1 trt1 <sup>+</sup> ::G₀-13myc-kanMX6 tpz1-Y439R,L445R::hphMX
	5	JH11611	trt1-myc tpz1-	h_ade6-M210 his3-D1 trt1 <sup>+</sup> ∷G₅-13myc-kanMX6 tpz1- X439R L445R L449R∵babMX
	6	JH11644	$trt1$ -myc ccq1 $\Delta$	$h^+$ his3-D1 trt1 <sup>+</sup> ::G <sub>6</sub> -13myc-kanMX6 tpz1 <sup>+</sup> ::hphMX ccq1 $\Delta$ ::hphMX
S8D	1	TN2411	tpz1⁺	h <sup>-</sup> his3-D1
	2	TN7196	tpz1-myc	h <sup>-</sup> his3-D1 tpz1 <sup>+</sup> ::13myc-kanMX6
	3	TN9009	tpz1-myc ccq1 $\Delta$	h <sup>+</sup> his3-D1 tpz1-13myc:KanMX6 ccq1∆::hphMX
	4	JH11181	tpz1-L449R-myc	h <sup>°</sup> ade6-M216 tpz1-L449R::13myc-kanMX6
	5	JH11218	tpz1-Y439R,L445R-myc	h <sup>+</sup> ade6-M210 his3-D1 tpz1-Y439R,L445R::13myc-kanMX6
	6	JH11232	tpz1-Y439R,L445R,L449R- myc	h <sup>+</sup> ade6-M210 his3-D1 tpz1-Y439R,L445R,L449R::13myc-kanMX6
S9A	1	JH11289	$ccq1^{+}$ (no tag)	h <sup>-</sup> his3-D1 tpz1 <sup>+</sup> ::hphMX
	2	JH11569	ccq1-myc	h`his3-D1 ccq1`::13myc-kanMX6 tpz1`::hphMX
	3	TN14558	ccq1-myc tpz1-L449A	h <sup>°</sup> his3-D1 ccq1 <sup>°</sup> ::13myc-kanMX6 tpz1-L449A::hphMX
	4	JH11622	ccq1-myc tpz1-L449R	h" his3-D1 ccq1"::13myc-kanMX6 tpz1-L449R::hphMX
S9B	1	JH11289	<i>trt1</i> ⁺ (no tag)	h⁻ his3-D1 tpz1⁺::hphMX
	2	JH11630	trt1-myc	h <sup>*</sup> ade6-M216 his3-D1 trt1 <sup>+</sup> ::G <sub>8</sub> -13myc-kanMX6 tpz1 <sup>+</sup> ::hphMX
	3	JH11644	$trt1$ -myc ccq1 $\Delta$	h <sup>+</sup> his3-D1 trt1 <sup>+</sup> ::G <sub>8</sub> -13myc-kanMX6 tpz1 <sup>+</sup> ::hphMX ccq1∆::hphMX
	4	TN14545	trt1-myc tpz1-L449A	h his3-D1 trt1 <sup>+</sup> ::G <sub>8</sub> -13myc-kanMX6 tpz1-L449A::hphMX
	5	JH11626	trt1-myc tpz1-L449R	h <sup>*</sup> ade6-M216 his3-D1 trt1 <sup>+</sup> ::G <sub>8</sub> -13myc-kanMX6 tpz1-L449R::hphMX
	6	YTC12756	trt1-D743A-myc	h <sup>-</sup> ade6-M210 his3-D1 trt1-D743A::G <sub>8</sub> -13myc-kanMX6
S10B	1	TN2411	<i>tpz1</i> ⁺ (no tag)	h <sup>°</sup> his3-D1
	2	TN7196	tpz1-myc	h <sup>-</sup> his3-D1 tpz1 <sup>+</sup> ::13myc-kanMX6
	3	JH10915	tpz1-[1-379]-myc	h <sup>-</sup> ade6-M216 tpz1-[1-379]::13myc-kanMX6
	4	JH10919	tpz1-[1-420]-myc	h <sup>-</sup> ade6-M216 his3-D1 tpz1-[1-420]::13myc-kanMX6
	5	JH11215	tpz1-[∆421-485]-myc	h⁺ ade6-M216 his3-D1 tpz1-[Δ421-485]::13myc-kanMX6
	6	JH10922	tpz1-[1-485]-myc	h <sup>-</sup> ade6-M210 his3-D1 tpz1-[1-485]::13myc-kanMX6
S10C	1,7	TN2411	<i>tpz1</i> ⁺ (no tag)	h <sup>-</sup> his3-D1
	2	TN7196	tpz1-myc	h <sup>-</sup> his3-D1 tpz1 <sup>+</sup> ::13myc-kanMX6
	3	JH10915	tpz1-[1-379]-myc	h ade6-M216 tpz1-[1-379]::13myc-kanMX6
	4	JH10919	tpz1-[1-420]-myc	h ade6-M216 his3-D1 tpz1-[1-420]::13myc-kanMX6
	5	JH11215	tpz1-[∆421-485]-myc	h <sup>+</sup> ade6-M216 his3-D1 tpz1-[Δ421-485]::13myc-kanMX6
	6	JH10922	tpz1-[1-485]-myc	h ade6-M210 his3-D1 tpz1-[1-485]::13myc-kanMX6
S10D	1	TN7196	tpz1-myc	h <sup>-</sup> his3-D1 tpz1 <sup>+</sup> ::13myc-kanMX6
	2	JH10915	tpz1-[1-379]-myc	h <sup>-</sup> ade6-M216 tpz1-[1-379]::13myc-kanMX6
	3	JH10919	tpz1-[1-420]-myc	h ade6-M216 his3-D1 tpz1-[1-420]::13myc-kanMX6
	4	JH11215	tpz1-[∆421-485]-myc	h⁺ ade6-M216 his3-D1 tpz1-[Δ421-485]::13myc-kanMX6
	5	JH10922	tpz1-[1-485]-myc	h <sup>-</sup> ade6-M210 his3-D1 tpz1-[1-485]::13myc-kanMX6
S11B		TN7196	tpz1-myc	h <sup>-</sup> his3-D1 tpz1 <sup>+</sup> ::13myc-kanMX6
		JH12981	tpz1-myc pot1∆	h <sup>°</sup> ade6-M216 his3-D1 tpz1⁺::13myc-kanMX6 pot1∆::natMX
S11C	1	TN7196	tpz1-myc	h <sup>-</sup> his3-D1 tpz1 <sup>+</sup> ::13myc-kanMX6
	2	YTC9366	tpz1-myc poz1 $\Delta$	h <sup>-</sup> his3-D1 tpz1⁺::13myc-kanMX6 poz1∆::natMX6
	3	TN9009	tpz1-myc ccq1∆	h <sup>+</sup> his3-D1 tpz1-13myc:KanMX6 ccq1∆::hphMX
	4	JH11701	tpz1-myc poz1 $\Delta$ cca1 $\Delta$	h⁺ his3-D1 tpz1⁺::13myc-kanMX6 poz1∆::natMX6 ccɑ1∆::hphMX
	5	JH11835	tpz1-L449R-mvc	h <sup>+</sup> ade6-M210 his3-D1 tpz1-L449R::13mvc-kanMX6
	6	JH11190	tpz1-W498R.I501R-mvc	h <sup>+</sup> leu1-32 ura4-D18 ade6-M216 his3-D1 tpz1-W498R.I501R::13mvc-kanMX6
	7	JH11781	tpz1-L449R,W498R,I501R-	h <sup>+</sup> ade6-M216 his3-D1 tpz1-L449R,W498R,I501R::13myc-kanMX6
	8	1110022	111yu toz1-[1-485]-mvc	h <sup>-</sup> ade6-M210 his3-D1 toz1-I1-4851-13mvc-kanMY6
	G G	IH11700	toz1_[1_485]_1 1/0P_mvc	h adoo-m2 to hiso-D t ip2 t-1 t-tooj tohiyo-kaliivizo h ada6.M216 his3.D1 tnz1.[1.485].[ 440P+13mva-kanMY6
-	5	01111/00	1921-[1-700]-L <del>77</del> 91(-11190	

Figure		Strain		Full Genotype <sup>a</sup>
S11D	1	YTC9716	pot1-FLAG	h <sup>+</sup> his3-D1 pot1 <sup>+</sup> ::3FLAG-kanMX
	2	JH11046	, pot1-FLAG tpz1-myc	h his3-D1 pot1 <sup>+</sup> ::3FLAG-kanMX tpz1 <sup>+</sup> ::13myc-kanMX6
	3	JH12971	pot1-FLAG tpz1-myc ccq1 $\Delta$	h his3-D1 pot1⁺::3FLAG-kanMX tpz1⁺::13myc-kanMX6 ccq1∆::hphMX
	4	JH12975	pot1-FLAG tpz1-myc poz1 $\Delta$	h <sup>+</sup> his3-D1 pot1 <sup>+</sup> ::3FLAG-kanMX tpz1 <sup>+</sup> ::13myc-kanMX6 poz1 <u>A</u> ::natMX6
	5	JH12977	pot1-FLAG tpz1-myc poz1 $\Delta$	h <sup>+</sup> his3-D1 pot1 <sup>+</sup> ::3FLAG-kanMX tpz1 <sup>+</sup> ::13myc-kanMX6 poz1 <u>A</u> ::natMX6
			ccq1A	ccq1 <i>∆::hphMX</i>
S12A	1	TN2411	tpz1⁺	h <sup>-</sup> his3-D1
	2	YTC8354	poz1A	h <sup>°</sup> ade6-M216 his3-D1 poz1∆∷natMX6
	3	TN5345	rap1∆	$h^{+}$ his3-D1 rap1 $\Delta$ ::ura4 $^{+}$
	4	TN7196	tpz1-myc	h <sup>-</sup> his3-D1 tpz1 <sup>+</sup> ::13myc-kanMX6
	5	YTC9366	tpz1-myc poz1 $\Delta$	h⁻ his3-D1 tpz1⁺::13myc-kanMX6 poz1∆::natMX6
	6	YTC9310	tpz1-myc rap1∆	h⁻ his3-D1 tpz1⁺::13myc-kanMX6 rap1∆::ura4⁺
	7	JH12951	tpz1-myc poz1 $\Delta$ rap1 $\Delta$	h⁻his3-D1 tpz1⁺::13myc-kanMX6 poz1∆::natMX6 rap1∆::ura4⁺
	8	JH11191	tpz1-W498R,I501R-myc	h <sup>+</sup> ade6-M216 his3-D1 tpz1-W498R,I501R::13myc-kanMX6
	9	JH11692	tpz1-W498R,I501R-тус poz1∆	h <sup>-</sup> ade6-M216 his3-D1 tpz1-W498R,I501R::13myc-kanMX6 poz1∆::natMX6
	10	JH12052	tpz1-W498R,I501R-myc rap1∆	$h^{\star}$ ade6-M216 his3-D1 tpz1-W498R,I501R::13myc-kanMX6 rap1 $\Delta$ ::ura4 $^{\star}$
	11	JH12955	tpz1-W498R,I501R-myc poz1∆ rap1∆	h <sup>-</sup> his3-D1 tpz1-W498R,I501R::13myc-kanMX6 poz1∆::natMX6 rap1∆::ura4 <sup>+</sup>
S12B	1	TN2411	tnz1 <sup>+</sup>	h <sup>-</sup> his3-D1
0120	2	JH12908	tpz1-W498R I501R	h ade6-M210 his3-D1 toz1-W498R I501R hphMX
	3	TN7217	cca1-mvc	h <sup>°</sup> his3-D1 cca1 <sup>+</sup> ::13mvc-kanMX6
	4	YTC8712	$cca1-mvc$ $poz1\Lambda$	h <sup>+</sup> his3-D1 ccq1 <sup>+</sup> ::13mvc-kanMX6 poz1/\::natMX6
	5	JH12894	cca1-mvc tpz1-W498R.I501R	h <sup>°</sup> his3-D1 ccq1 <sup>+</sup> ::13mvc-kanMX6 tpz1-W498R.I501R::hphMX
	6	JH12897	ccq1-myc tpz1-W498R,I501R poz1∆	h <sup>-</sup> his3-D1 ccq1 <sup>+</sup> ::13myc-kanMX6 tpz1-W498R,I501R::hphMX poz1∆::natMX6
S12C	1	TN11289	tpz1 <sup>+</sup>	h <sup>-</sup> his3-D1 tpz1 <sup>+</sup> ::hphMX
	2	JH12908	tpz1-W498R,I501R	h ade6-M210 his3-D1 tpz1-W498R,I501R::hphMX
	3	JH12265	poz1-myc	h <sup>+</sup> his3-D1 poz1 <sup>+</sup> ::13myc-kanMX6 tpz1 <sup>+</sup> ::hphMX
	4	JH12267	poz1-myc rap1∆	h⁺ his3-D1 poz1⁺::13myc-kanMX6_tpz1⁺::hphMX rap1∆::ura4⁺
	5	JH12659	poz1-myc tpz1-W498R,I501R	h <sup>+</sup> ade6-M210 his3-D1 poz1 <sup>+</sup> ::13myc-kanMX6 tpz1-W498R,I501R::hphMX
	6	JH12056	poz1-myc tpz1-W498R,I501R rap1∆	h⁺ ade6-M210 his3-D1 poz1⁺::13myc-kanMX6 tpz1-W498R,I501R::hphMX rap1∆::ura4⁺
S12D	1	TN11289	tpz1 <sup>+</sup>	h <sup>-</sup> his3-D1 tpz1 <sup>+</sup> ··hphMX
0.20	2	JH12908	tpz1-W498R.I501R	h <sup>-</sup> ade6-M210 his3-D1 tpz1-W498R.I501R::hphMX
	3	JH11630	trt1-myc	h <sup>-</sup> ade6-M216 his3-D1 trt1 <sup>+</sup> ::G <sub>8</sub> -13myc-kanMX6 tpz1 <sup>+</sup> ::hphMX
	4	JH12770	$trt1-myc$ poz1 $\Delta$	h ade6-M216 his3-D1 trt1⁺::G₀-13myc-kanMX6 tpz1⁺::hphMX poz1∆::natMX6
	5	JH12766	trt1-myc tpz1-W498R,I501R	h his3-D1 trt1 <sup>+</sup> ::G <sub>8</sub> -13myc-kanMX6 tpz1-W498R,I501R::hphMX
S13A	1	TN2411	tpz1⁺	h <sup>°</sup> his3-D1
	2	YTC8354	poz1A	h <sup>-</sup> ade6-M216 his3-D1 poz1∆∷natMX6
	3	TN7196	tpz1-myc	h⁻ his3-D1 tpz1⁺::13myc-kanMX6
	4	YTC9366	tpz1-myc poz1 $\Delta$	h⁻ his3-D1 tpz1⁺::13myc-kanMX6 poz1∆::natMX6
	5	JH11191	tpz1-W498R,I501R-myc	h <sup>+</sup> ade6-M216 his3-D1 tpz1-W498R,501R::13myc-kanMX6
	6	JH11692	tpz1-W498R,I501R-myc poz1∆	h <sup>-</sup> ade6-M216 his3-D1 tpz1-W498R,I501R::13myc-kanMX6 poz1∆::natMX6
S13B	1	TN2411	tpz1⁺	h <sup>-</sup> his3-D1
	2	JH12908	tpz1-W498R,I501R	h <sup>-</sup> ade6-M210 his3-D1 tpz1-W498R,I501R::hphMX
	3	TN7217	ccq1-myc	h his3-D1 ccq1⁺::13myc-kanMX6
	4	YTC8712	$ccq1$ -myc poz1 $\Delta$	h⁺ his3-D1 ccq1⁺::13myc-kanMX6 poz1∆::natMX6
	5	JH12895	ccq1-myc tpz1-W498R,I501R	h <sup>+</sup> his3-D1 ccq1 <sup>+</sup> ::13myc-kanMX6 tpz1-W498R,I501R::hphMX
	6	JH12897	ccq1-myc tpz1-W498R,I501R poz1∆	h <sup>-</sup> his3-D1 ccq1 <sup>+</sup> ::13myc-kanMX6 tpz1-W498R,I501R::hphMX poz1∆::natMX6

Figure		Strain		Full Genotype <sup>a</sup>
S13C	1	TN11289	tpz1⁺	h⁻ his3-D1 tpz1⁺::hphMX
	2	JH12908	tpz1-W498R,I501R	h <sup>-</sup> ade6-M210 his3-D1 tpz1-W498R,I501R::hphMX
	3	JH12265	poz1-myc	h <sup>+</sup> his3-D1 poz1 <sup>+</sup> ::13myc-kanMX6 tpz1 <sup>+</sup> ::hphMX
	4	JH12267	poz1-myc rap1 $\Delta$	h⁺ his3-D1 poz1⁺::13myc-kanMX6 tpz1⁺::hphMX rap1∆::ura4⁺
	5	JH12659	poz1-myc tpz1-W498R,I501R	h <sup>+</sup> ade6-M210 his3-D1 poz1 <sup>+</sup> ::13myc-kanMX6 tpz1-W498R,I501R::hphMX
	6	JH12056	poz1-myc tpz1-W498R,I501R rap1∆	h <sup>+</sup> ade6-M210 his3-D1 poz1 <sup>+</sup> ::13myc-kanMX6 tpz1-W498R,I501R::hphMX rap1∆::ura4 <sup>+</sup>
S13D	1	TN11289	tpz1⁺	h <sup>-</sup> his3-D1 tpz1 <sup>+</sup> ::hphMX
	2	JH12908	tpz1-W498R,I501R	h <sup>-</sup> ade6-M210 his3-D1 tpz1-W498R,I501R::hphMX
	3	JH11630	trt1-myc	h <sup>-</sup> ade6-M216 his3-D1 trt1 <sup>+</sup> ::G <sub>8</sub> -13myc-kanMX6 tpz1 <sup>+</sup> ::hphMX
	4	JH12770	$trt1$ -myc poz1 $\Delta$	h ade6-M216 his3-D1 trt1 <sup>+</sup> ::G <sub>8</sub> -13myc-kanMX6 tpz1 <sup>+</sup> ::hphMX poz1∆::natMX6
	5	JH12766	trt1-myc tpz1-W498R,I501R	h his3-D1 trt1 <sup>+</sup> ::G <sub>8</sub> -13myc-kanMX6 tpz1-W498R,I501R::hphMX

<sup>1</sup>All strains are *leu1-32 ura4-D18* (haploid) or *leu1-32/leu1-32 ura4-D18/ura4-D18* (diploid)

Fable S3 Plasmids used to integrate tpz1 mutant alleles into fission yeast.				
Plasmid (Lab stock #)	Mutant alleles			
pBS-tpz1-13myc-kanMX (607)	tpz1-myc			
pBS-tpz1-L449R-13myc-kanMX (697)	tpz1-L449R-myc			
pBS-tpz1-L449A-13myc-kanMX (836)	tpz1-L449A-myc			
pBS-tpz1-Y439R,L445R-13myc-kanMX (716)	tpz1-Y439R,L445R-myc			
pBS-tpz1-Y439R,L445R,L449R-13myc-kanMX (718)	tpz1-Y439R,L445R,L449R-myc			
pBS-tpz1(1-485)-13myc-kanMX (654)	tpz1-[1-485]-myc			
pBS-tpz1-W498R,I501R-13myc-kanMX (707)	tpz1-W498R,I501R-myc			
pBS-tpz1(1-485)-L449R-13myc-kanMX (773)	tpz1-[1-485]-L449R-myc			
pBS-tpz1-L449R,W498R,I501R-13myc-kanMX (772)	tpz1-L449R,W498R,I501R-myc			
pBS-tpz1(1-379)-13myc-kanMX (652)	tpz1-[1-379]-myc			
pBS-tpz1(1-420)-13myc-kanMX (653)	tpz1-[1-420]-myc			
pBS-tpz1(Δ421-485)-13myc-kanMX (670)	tpz1-[Δ421-485]-myc			

Table S4 Plasmids used in yeast 2-hybrid assays.	
Plasmid (Lab stock #)	Description in Figures
pGADT7 (352)	vector
pGADT7-Poz1 (452)	Poz1
pGAD-GH-Ccq1 (549)	Ccq1
pTM623 (pMP623; Pot1 with GAD) (464) <sup>1</sup>	Pot1
pGBKT7 (356)	vector
pGBKT7-Tpz1 (495)	Tpz1-FL (full length)
pGBKT7-Tpz1-[379-508] (614)	Tpz1-[379-508]
pGBKT7-Tpz1-[421-508] (616)	Tpz1-[421-508]
pGBKT7-Tpz1-[421-485] (651)	Tpz1-[421-485]
pGBKT7-Tpz1-[486-508] (650)	Tpz1-[486-508]
pGBKT7-Tpz1-[1-485] (708)	Tpz1-[1-485]
pGBKT7-Tpz1-[∆421-485] (689)	Tpz1-[∆421-485]
pGBKT7-Tpz1-Y439R (682)	Y439R
pGBKT7-Tpz1-L445R (683)	L445R
pGBKT7-Tpz1-E446R (684)	E446R
pGBKT7-Tpz1-Y439R,L445R,E446R (666)	Y439R,L445R,E446R
pGBKT7-Tpz1-Y439R,L445R (700)	Y439R.L445R
pGBKT7-Tpz1-L449R,Y453R (667)	L449R,Y453R
pGBKT7-Tpz1-L449R (685)	L449R
pGBKT7-Tpz1-Y439R,L445R,L449R (701)	Y439R,L445R,L449R
pGBKT7-Tpz1-Y453R (686)	Y453R
pGBKT7-Tpz1-[421-485]-L449R (763)	Tpz1-[421-485] L449R
pGBKT7-Tpz1-[421-485]-Y439R,L445R (762)	Tpz1-[421-485] Y439R,L445R
pGBKT7-Tpz1-[421-485]-Y439R,L445R,L449R (764)	Tpz1-[421-485] Y439R,L445R,L449R
pGBKT7-Tpz1-W498R,I501R (669)	W498R,I501R
pGBKT7-Tpz1-[486-508]-W498R,I501R (673)	Tpz1-[486-508] W498R,I501R
pGBKT7-Tpz1-K386A (594)	K386A
pGBKT7-Tpz1-R433A,K434A (597)	R433A,K434A
pGBKT7-Tpz1-E455A,K459A,K460A (598)	E455A,K459A,K460A
pGBKT7-Tpz1-D497A,K500A,R505A (600)	D497A,K500A,R505A
pGBKT7-Tpz1-R433A,K434A,E455A,K459A,K460A (617)	R433A,K434A,E455A,K459A,K460A
pGBKT7-Tpz1-R433A,K434A,D497A,K500A,R505A (619)	R433A,K434A,D497A,K500A,R505A
pGBKT7-Tpz1-E455A,K459A,K460A,D497A,K500A,R505A (620)	E455A,K459A,K460A,D497A,K500A,R505A
pGBKT7-Tpz1-R433E,K434E (643)	R433E,K434E
pGBKT7-Tpz1-K459E,K460E (644)	K459E,K460E
pGBKT7-Tpz1-K500E,R505E (645)	K500E,R505E
pGBKT7-Tpz1-W498A,I501A (794)	W498A,I501A
pGBKT7-Tpz1-L449A (795)	L449A
pGBKT7-Tpz1-Y439A,L445A (796)	Y439A,L445A

<sup>1</sup>From Ishikawa lab.

Table	S5 Statistical analysis of ChIP and T	ER1 co-IP c	lata by 2-tai	led Student'	s t-test.	
Figure	G	enotypes ar	nd p-values <sup>1</sup>			
5A		no tag	tpz1-myc	tpz1-myc ccq1∆	tpz 1-L449R -myc	tpz1-Y439R, L445R-myc
	tpz1-myc	2.5x10 <sup>-4</sup>				
	$tpz1-myc ccq1\Delta$	4.9x10 <sup>-5</sup>	0.024			
	tpz1-L449R-myc	1.9x10 <sup>-4</sup>	9.3x10 <sup>-3</sup>	0.22		,
	tpz1-Y439R,L445R-myc	8.9x10 <sup>-3</sup>	7.6x10 <sup>-3</sup>	0.11	0.41	
	tpz1-Y439R,L445R,L449R-myc	0.018	0.029	0.46	0.98	0.61
5B		no tag	ccq1-myc	ccq1-myc tpz1-L449R	ccq1-myc tpz1-Y439R, L445R	
		4.0010	1 Ex10 <sup>-4</sup>			
	<u>ccq1-myc tpz1-L449R</u>	$5.6X10^{-5}$	$1.5 \times 10^{-5}$	0.027		
	<u>ccq1-myc tpz1-7439R,L445R</u>	$2.3 \times 10^{-5}$	7.3010	0.037	0.21	
	ccq1-myc (p21-1459K,L445K,L449K	2.1710	2.0010	0.29	0.21	
<u>5C</u>		no tag	trt1-myc	trt1-myc ccq1∆	trt1-myc tpz1-L449R	trt1-myc tpz1-Y439R, L445R
		4.9X10	4.4.40-3			
	$trt1-myc ccq1\Delta$	8.2X10 <sup>-5</sup>	$4.1 \times 10^{-4}$	0.47		,
		$1.7 \times 10^{-3}$	$3.2 \times 10$	0.47	0.07	
	trt1 myc tpz1 V420P I 445P I 440P	$2.7 \times 10^{-3}$	3.1X10	0.62	0.67	0.97
	(111-11)C (P21-1439R,E445R,E449R	0.3710	4.4710	0.90	0.55	0.87
<u>7</u> A	$tpz1-myc$ poz1 $\Lambda$	2.2x10 <sup>-3</sup>	tpz1-myc poz1∆	tpz1-W498R, I501R-myc		
	tpz1-W498R,I501R-myc	1.1x10 <sup>-3</sup>	0.65			
	tpz1-W498R,I501R-myc poz1∆	7.6x10 <sup>-3</sup>	0.55	0.41		
_7B		ccq1-myc	ccq1-myc poz1∆	ccq1-myc tpz1-498R, I501R		
	$ccq1$ -myc poz1 $\Delta$	0.39				
	ccq1-myc tpz1-W498R,I501R	0.10	0.77			
	ccq1-myc tpz1-W498R,I501R poz1∆	0.07	0.28	0.35		
7C		poz1-myc	poz1-myc rap1∆	poz1-myc tpz1-498R, I501R		
	poz1-myc rap1Δ	/./x10 <sup>-∞</sup>	1.6v10 <sup>-3</sup>			<u> </u>
	роz1-тус трz1-W498R,I501R poz1-тус tpz1-W498R,I501R rap1Δ	1.8x10 <sup>-3</sup>	4.3x10 <sup>-4</sup>	0.21		

		t1-myc	t1-myc ⊃z1∆			
7D		<u></u>	pc pc			
	$trt1$ -myc poz1 $\Delta$	5.3x10 <sup>°</sup>	0.00			
	III 1-III yC IP2 1-W498R, 150 TR	0.0210	0.09			
S8D		no tag	tpz1-myc	tpz1-myc ccq1∆	tpz1-L449R -myc	tpz1-Y439R, L445R-myc
	tpz1-myc	1.1x10 °				
	$tpz1-myc ccq1\Delta$	0.46	2.0x10 <sup>+</sup>	0.10		
	tpz1-L449R-myc	0.80	1.3x10 <sup>+</sup>	0.19	0.50	
	tpz1-Y439R,L445R-myc	0.79	$4.8 \times 10^{-4}$	0.50	0.52	0.04
	tpz1-¥439R,L445R,L449R-myc	0.54	2.0X10	0.22	0.24	0.64
S9A	cog1 muo	uo tag	ccq 1-myc	ccq1-myc tpz1-L449A		
	ccq1-myc toz1-1 4494	$\frac{2.7 \times 10}{8.2 \times 10^{-3}}$	0.056			
	ccq1-myc tpz1-L449R	$6.4 \times 10^{-6}$	0.035	0.66		
		0.4710	0.000	0.00		
S9B		no tag	trt1-myc	trt1-myc ccq1∆	trt1-myc tpz1-L449A	rt1-myc tpz1-L449R
		4.9X10 9.2×10 <sup>-3</sup>	4 1×10 <sup>-3</sup>			
	$\frac{tr(1-rnyc)ccq1\Delta}{tra1-rnyc)tra1 + 440A}$	0.2X10 1 1×10 <sup>-5</sup>	4.1X10	0 15		
	trt1_myc tpz1-L449A	$1.1 \times 10^{-5}$	$3.2 \times 10^{-4}$	0.15	0.20	
	trt1-D7434-mvc	8 1x10 <sup>-9</sup>	6.9x10 <sup>-3</sup>	0. <del>4</del> 7 7 3x10 <sup>-5</sup>	4.8x10 <sup>-5</sup>	1 1x10 <sup>-7</sup>
		0.1710	0.3710	7.5710	4.0710	1.1710
<u>S13A</u>		no tag ( <i>tpz1</i> <sup>+</sup> )	<i>poz1∆</i> (no tag)	tpz1-myc	tpz1-myc poz1∆	tpz1-W498R, I501R-myc
	<i>_poz1∆</i> (no tag)	0.54				
	tpz1-myc	1.8x10 <sup>-9</sup>	2.8x10 <sup>-5</sup>			
	tpz1-myc poz1∆	5.2x10 <sup>-9</sup>	3.1x10 <sup>-°</sup>	1.0x10 <sup>-3</sup>		
	tpz1-W498R,I501R-myc	7.9x10 <sup>-10</sup>	5.1x10 <sup>-⁰</sup>	2.5x10 <sup>-3</sup>	0.67	
	tpz1-W498R,I501R-myc poz1∆	1.9x10⁻′	3.2x10 <sup>-4</sup>	2.6x10 <sup>-3</sup>	0.66	0.50
<u>S13B</u>		no tag ( <i>tpz1</i> <sup>+</sup> )	<i>tpz1-W</i> 498 <i>R</i> , <i>I501R</i> (no tag)	ccq1-myc	ccq1-myc poz1∆	ccq1-myc tpz1-498R, 1501R
	<i>tpz1-W498R,I501R</i> (no tag)	$7.2 \times 10^{-2}$	1 1 1 1 1 0 -4			
		1.1X1U	1.1X10	0.027		
	$\frac{1}{2} \cos(1 - m_V) \cos(1 - M/408 P) = \frac{1}{2} \cos(1 - m_V) \cos(1 - M/408 P) = \frac{1}{2} \cos(1 - m_V) \cos(1 - $	2.1X10 $1.0v10^{-4}$	2.1X10	0.037	0.95	
	$cca1$ -myc tpz1-W498R.I501R poz1 $\Delta$	1.0x10 <sup>-3</sup>	1.0x10 <sup>-3</sup>	0.31	0.28	0.32

S13C		no tag ( <i>tpz1</i> <sup>+</sup> )	<i>tpz1-W</i> 498R, <i>I501R</i> (no tag)	poz1-myc	poz1-myc rap1∆	poz1-myc tpz1-498R, I501R
	<i>tpz1-W498R,I501R</i> (no tag)	0.44				
	poz1-myc	1.7x10 <sup>-3</sup>	7.6x10 <sup>-5</sup>			
	poz1-myc rap1 $\Delta$	1.2x10 <sup>-3</sup>	4.3x10 <sup>-5</sup>	0.048		
	poz1-myc tpz1-W498R,I501R	0.010	6.2x10 <sup>-4</sup>	2.1x10 <sup>-3</sup>	1.6x10 <sup>-3</sup>	
	poz1-myc tpz1-W498R,I501R rap1∆	4.5x10 <sup>-3</sup>	2.6x10 <sup>-4</sup>	5.0x10 <sup>-4</sup>	4.1x10 <sup>-4</sup>	0.27
S13D		no tag ( <i>tpz1</i> <sup>+</sup> )	<i>tpz1-W498R</i> , <i>I501R</i> (no tag)	trt1-myc	trt1-myc poz1∆	
	<i>tpz1-W498R,I501R</i> (no tag)	0.97				
	trt1-myc	9.8x10 <sup>-6</sup>	3.6x10 <sup>-6</sup>			
	$trt1$ -myc poz1 $\Delta$	2.9x10 <sup>-6</sup>	1.7x10 <sup>-6</sup>	1.1x10 <sup>-3</sup>		
	trt1-myc tpz1-W498R,I501R	3.3x10 <sup>-5</sup>	2.6x10 <sup>-5</sup>	0.011	0.61	

<sup>1</sup>Statistically significant differences ( $p \le 0.05$ ) are highlighted with red letters.