## Supplemental Materials Molecular Biology of the Cell

Elmore et al.



**Figure S1. Comparison of Hhp1 and Hhp2 functions and localizations.** (A) Anti-GFP immunoblot of whole-cell extracts prepared from untagged and the indicated GFP-tagged strains. Anti-PSTAIREantibody served as loading control for lysates. (B) Serial dilutions (10-fold) of the indicated strains were spotted on YE plates and incubated at the indicated temperatures. (C) Liquid growth assay of wildtype, *hhp1* $\Delta$ , *hhp2* $\Delta$  and *hhp1* $\Delta$  *hhp2* $\Delta$  mutants. Cells were grown in liquid

YE at 32°C to log phase and cut back to an  $OD_{595}=0.1$ .  $OD_{595}$  measurements were taken every hour for 8 h to determine growth rates of mutants. (D) *wildtype*, *hhp1* $\Delta$ , *hhp2* $\Delta$ , and *hhp1* $\Delta$  *hhp2* $\Delta$  mutant phenotypes were analyzed by DAPI (DNA) and methyl blue (cell wall) staining. (E and F) (Left panels) Representative montages of Hhp1-mNG (E) and Hhp2-mNG (F) movies. Images are shown in 4 min intervals with T=0 defined as the time of SPB separation. Right panels are timelines showing when Hhp1-mNG and Hhp2-mNG are detected at the division site. The mean time of detection of each protein ± SD is plotted from 20 cells each. The onset of anaphase B was determined to be 10.4 ± 1.2 min for *hhp1mNG* and 10.5 ± 1.9 min for *hhp2-mNG* cells. Hhp1-mNG was detected at the division site at 31 ± 3.3 min and Hhp2-mNG at 21 ± 3.8 min. Scale bars, 5 µm.



**Figure S2. SPB targeting information of Hhp1/2 resides within the kinase domain**(A) Live cell imaging of wildtype cells expressing *pREP81-GFP-hhp1-(280-365)* grown in the absence of thiamine for 20 hours at 32°C. (B) Anti-GFP immunoblot of whole-cell extracts prepared from wildtype cells carrying*pREP81*, *pREP81-GFP*, and *pREP81-GFP-hhp1-(280-365)* grown in the absence of thiamine for 20 h at 32°C. (C and D) Representative images of the indicated

strains. Inverted grayscale images are shown for mNG and mCherry (mCh). Quantitation of Hhp1-(1-296)-mNG and Hhp2-(1-295)-mNG at SPBs is shown on the right represented as mNG/Sad1-mCherry ratios. \*p<0.001 determined using Students *t*-test. Error bars represent SEM. Scale bars, 5 µm.



Supplemental Figure 3

**Figure S3. The KDE of Hhp1/2 is required for enzymatic function** *in vivo* **and** *in vitro*(A)Anti-GFP immunoblot of whole-cell extracts prepared from untagged

and the indicated GFP-tagged strains. Anti-PSTAIRE antibody served as loading control for lysates.(B) Live-cell imaging of endogenously tagged Hhp1-(1-280)-GFP and Hhp2-(1-278)-GFP with Sid4-RFP. Bars, 5  $\mu$ m.(C) Serial 10-fold dilutions of the indicated strains were spotted on YE plates and incubated at the indicated temperatures.(D)Sid4 was immunoprecipitated from denatured cell lysates of the indicated strains, treated with phosphatase, and visualized by immunoblotting. (E) *In vitro* phosphorylation of casein by recombinant MBP-Hhp1-(1-280) and MBP-Hhp2-(1-278). Kinases were detected by CB staining of SDS-PAGE gels, and phosphorylated casein was detected by autoradiography (<sup>32</sup>P). (F) Recombinant full length Hhp1/2 and the indicated Hhp1/2 truncation mutants were dephosphorylated with  $\lambda$ -phosphatase and used in *in vitro* kinase assays with increasing levels of casein (0-60 $\mu$ M). <sup>32</sup>P incorporationof casein was quantified by Phophorimager.



**Figure S4.Hhp1/2 kinase-dead mutants localize to the SPB.** (A) Growth assay of *hhp1-(K40R)*, *hhp2-(K41R)*, and *hhp1-(K40R) hhp2-(K41R)* mutants. Serial dilutions (10-fold) of the indicated single and double mutant strains were spotted on YE plates and incubated at the indicated temperatures. (B) Sid4 from the indicated strains was immunoprecipitated from denatured cell lysates, treated with phosphatase, and visualized by immunoblotting. (C and D)*hhp1-(K40R)*-

mNG(C) or hhp2-(K41R)-mNG (D) cells were labeled with tetramethylrhodamineisothiocyanate (TRITC)–lectin and mixed with hhp1mNG (C) or hhp2-mNG (D) cells and imaged live. Representative images are shown in the left panels and quantitation of fluorescence intensities are shown on the right.A.U.=arbitrary units. Scale bar, 5 µm. p values determined using Student's *t*-test. ns=not significant. Error bars represent SEM.



Figure S5. Expression of CK1 $\delta$ / $\epsilon$  centrosomal localization mutants. (A) Schematic diagrams of CK1 $\delta$ / $\epsilon$  with relative positions of N-terminal extension (N)

(green), catalytic domains (blue), kinase domain extensions (yellow) and unrelated C-termini in pink or purple indicated. (B) Anti-GFP immunoblot of whole-cell extracts prepared from the indicated transfected RPE1 cell lines. Anti- $\gamma$ -tubulin antibody served as loading control for lysates. (C) *In vitro* phosphorylation of casein by recombinant MBP-CK1 $\delta$ / $\epsilon$  and the indicated MBP-CK1 $\delta$ / $\epsilon$  mutants. Phosphorylated proteins were detected by CB staining of SDS-PAGE gels, followed by autoradiography (<sup>32</sup>P). (D) Anti-GFP immunoblot of whole-cell extracts prepared from the indicated transfected RPE1 cell lines. Anti- $\gamma$ -tubulin and anti- $\alpha$ -tubulin antibodies served as loading control for lysates.



Supplemental Figure 6

**Figure S6.Cki2 does not localize to the SPB**. (A) Anti-GFP immunoblot of whole-cell extracts prepared from untagged and the indicated GFP-tagged strains. Anti-PSTAIRE antibody served as loading control for lysates. (B) Live-cell imaging of endogenously tagged Cki2-GFP and Cki2-(1-429)-GFP with Sid4-RFP. Scale bars, 5um. (C) Homology model of Cki2 catalytic domain generated from Phyre<sup>2</sup> software and visualized with MacPymol.Surface residues with charge

differences between Cki2 and Hhp1 are colored. Green=hydrophobic residues, Red=acidic residues, Blue=basic residues. (D) Table of Cki2 surface residues with the corresponding mutations made in Hhp1and the effect of those mutations on SPB localization.(E)Growth assay of *hhp1-(R261E)*, *hhp1-(R261E) hhp2* $\Delta$ , *hhp1-(R272E K273E)*, and *hhp1-(R272E K273E) hhp2* $\Delta$  mutants. Serial 10-fold dilutions of the indicated single and double mutant strains were spotted on YE plates and incubated at the indicated temperatures. (F) *In vitro* kinase assays of recombinant MBP-Hhp1, MBP-Hhp1-(1-296), MBP-Hhp1-(R272E K273E) and MBP-Hhp1-(R272E K273E) and SDS-PAGE gels, with casein as substrate. Phosphorylated casein was detected by autoradiography (<sup>32</sup>P).



Figure S7. Hhp2 requires Ppc89 to localize to the SPB.(A) Localization of Hhp2-GFP in a *sid4-SA1* temperature sensitive strain at the permissive (25°C) and restrictive (36°C) temperatures. (B)Localization of Hhp2-GFP in a *ppc89* shut-off strain (-thiamine, ppc89 expression on; +thiamine, ppc89 expression off). Scale bars, 5  $\mu$ m.

## Table S1. Strains used in this study.

<u>Strain</u> Figure 1	Genotype	<u>Source</u>
KGY17313	hhp1-mNG:kan <sup>R</sup> sid4-RFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-	This study
KGY16868	hhp2-mNG:kan <sup>R</sup> sid4-RFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h+	This study
KGY17899	hhp1-mNG:kan <sup>R</sup> sad1-mCherry:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h+	This study
KGY17900	hhp1-mNG:kan <sup>R</sup> sad1-mCherry:kan <sup>R</sup> nda3-km311 ade6-M210 leu1-32 ura4-D18 h+	This study
KGY18725	hhp2-mNG:kan <sup>R</sup> sad1-mCherry:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h+	This study
KGY18726	hhp2-mNG:kan <sup>R</sup> sad1-mCherry:kan <sup>R</sup> nda3-km311 ade6-M210 leu1-32 ura4-D18 h+	This study
KGY19353	hhp2-mNG:kan <sup>R</sup> sad1-mCherry:kan <sup>R</sup> hhp1::ura4 <sup>+</sup> ade6-M210 leu1-32 h+	This study
Figure 2		
KGY246	ade6-M210 leu1-32 ura4-D18 h-	Lab stock
KGY14697	hhp1-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-	Lab stock
KGY15972	hhp1-(1-296)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-	This study
KGY12838	hhp2-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-	Lab stock
KGY16977	hhp2-(1-295)-GFP:kan <sup>r</sup> ade6-M210 leu1-32 ura4-D18 h+	This study
KGY19140	hhp1-(1-296)-GFP:kan <sup>k</sup> sid4-RFP:kan <sup>k</sup> ade6-M210 leu1-32 ura4-D18 h-	This study
KGY18815	hhp2-(1-295)-GFP:kan <sup>R</sup> sid4-RFP:kan <sup>R</sup> leu1-32 ura4-D18 h-	This study
KGY6415	hhp1::ura4 <sup>+</sup> leu1-32 h-	Bimbo et al., 2005
KGY7081	hhp2::ura4 <sup>+</sup> leu1-32 h-	Bimbo et al.,2005
KGY13958	hhp1::ura4 <sup>+</sup> hhp2::kan <sup>K</sup> leu1-32 h+	This study
KGY16775	hhp1-(1-296)-GFP:kan <sup>R</sup> hhp2::ura4 <sup>+</sup> ade6-M210 leu1-32 h-	This study
KGY17078	hhp1::ura4 <sup>+</sup> hhp2-(1-295)-GFP:kan <sup>ĸ</sup> ade6-M210 leu1-32 h+	This study
Figure3		
KGY16776	hhp1-(K40R)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-	This study
KGY17628	hhp2-(K41R)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-	This study
KGY19354	hhp1-(K40R)-mNG:kan <sup>R</sup> sid4-RFP:kanR ade6-M210 leu1-32 ura4-D18 h+	This study
KGY19444	hhp1-(K40R)-mNG:kan <sup>R</sup> hhp2::ura4 <sup>+</sup> sid4-RFP:kanR ade6-M210 leu1- 32 ura4-D18 h-	This study
KGY19445	hhp2-(K41R)-mNG:kan <sup>R</sup> hhp1::ura4 <sup>+</sup> sid4-RFP:kanR ade6-M210 leu1- 32 ura4-D18h?	This study
Figure5		
KGY17627	hhp1-(R261E)-mNG:kan <sup>R</sup> sid4-RFP:kanR leu1-32 ura4-D18 h-	This study
KGY17628	hhp1-(R272E K273E)-mNG:kan <sup>R</sup> sid4-RFP:kanR leu1-32 ura4-D18 h-	This study
KGY14522	hhp1-(R261E)-GFP:kan <sup>R</sup> leu1-32 ura4-D18 h-	This study
KGY14523	hhp1-(R272E K273E)-GFP:kan <sup>R</sup> leu1-32 ura4-D18h-	This study
Figure 6	R 160 44 MATe trad 400 low2 2 112 was 52 bis2 200 colds col804	Lab stack
KG11290	LYS2:GAL1-HIS3 GAL2-ADE2 met2::GAL-lacZ	Lad Slock
Figure 7		
KGY246	ade6-M210 ura4-D18 leu1-32 h-	Lab stock
KGY5663	nda3-km311 ade6-M21x ura4-D18 leu1-32 h+	Lab stock
KGY13805	nda3-KM311 dma1::ura4+ ade6-M21x leu1-32 ura4-D18 h+	Lab stock
KGY14395	nda3-KM311 hhp2::kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-	This study
KGY19352	hhp1-(R272E K273E)::kan <sup>R</sup> nda3-km311 ade6-M210 leu1-32 ura4-	This study
	D18 h-	

KGY3104-2   hhp1-(R261E)::kan <sup>R</sup> ndb3-KM311 ade6-M210 ura4-D18 leu1-32 h   This study     KGY3105-2   hhp1-(R261E)::kan <sup>R</sup> hhp2:.ura4+ ndb3-KM311 ade6-M210 ura4-D18   This study     KGY14525   hhp1-(R272E K273E)-GFP::kan <sup>R</sup> hhp2::ura4+ ade6-M210 ura4-D18 leu1-32   This study     KGY14526   hhp1-(R272E K273E)-GFP::kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 leu1-32   This study     KGY163343   hhp1-GFP:kan <sup>R</sup> hhp2-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-   This study     KGY16831   hhp1-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-   This study     KGY16831   hhp1-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-   This study     Figure S2   KGY17901   hhp1-(1-296)-mNG:kan <sup>R</sup> sad1-mCherry:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-   This study     KGY17902   hhp1-(1-280)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-   This study     Figure S3   hhp1-(1-280)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-   This study     KGY11643   hhp1-(1-280)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-   This study     hp1-(1-280)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-   This study   This study     KGY11828   hhp1-(K40R):kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-   This study   This study     KGY11783   hhp1-(K40R):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h-   This study   T	KGY18331	hhp1-(R272E K273E)::kan <sup>R</sup> hhp2::ura4 <sup>+</sup> nda3-KM311 ade6-M210 ura4-D18 leu1-32 h-	This study
Indp://R272E K273E)-GFP::kan <sup>R</sup> hhp2::ura4+ ura4-D18 leu1-32     This study       KGY14526     hhp1-(R272E K273E)-GFP::kan <sup>R</sup> hhp2::ura4+ ade6-M210 ura4-D18 leu1-32     This study       Figure S1     KGY16343     hhp1-GFP:kan <sup>R</sup> hhp2-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h+     This study       KGY1684     hhp1-GFP:kan <sup>R</sup> hhp2-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h+     This study       KGY16788     hhp1-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-     This study       Figure S2     KGY17901     hhp1-(1-296)-mNG:kan <sup>R</sup> sad1-mCherry:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-     This study       KGY17902     hhp1-(1-296)-mNG:kan <sup>R</sup> sad1-mCherry:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-     This study       KGY17902     hhp1-(1-280)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-     This study       KGY15971     hhp1-(1-280)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-     This study       KGY16143     hhp2-(1-278)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-     This study       KGY17079     hhp1-(1-280)-GFP:kan <sup>R</sup> hhp2::ura4' ade6-M210 leu1-32 ura4-D18 h-     This study       KGY16143     hhp2-(1-278)-GFP:kan <sup>R</sup> hhp2::ura4' ade6-M210 leu1-32 ura4-D18 h-     This study       KGY17079     hhp1-(1-280)-GFP:kan <sup>R</sup> hhp2::ura4' ade6-M210 leu1-32 ura4-D18 h-     This study       KGY17337	KGY3104-2 KGY3105-2	hhp1-(R261E)::kan <sup>R</sup> nda3-KM311 ade6-M210 ura4-D18 leu1-32 h- hhp1-(R261E)::kan <sup>R</sup> hhp2::ura4+ nda3-KM311 ade6-M210 ura4-D18	This study This study
KGY14526     Intp1-(12/22 K2/32)-3Fr. Latif Intp2und + und -D18 leu1-32     This study       Figure S1     htp1-(F2/22 K2/32)-3Fr. Latif Intp2und + und -D18 leu1-32     This study       KGY14526     htp1-GFP:kan <sup>R</sup> htp2-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-     This study       KGY16831     htp1-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-     This study       KGY16831     htp1-(F2/26 K2)     This study       KGY17901     htp1-(1-296)-mNG:kan <sup>R</sup> sad1-mCherry:kan <sup>R</sup> ade6-M210 leu1-32 ura4-     This study       D18 h-     This study     D18 h-     This study       KGY17902     htp1-(1-280)-GFP:kan <sup>R</sup> sad1-mCherry:kan <sup>R</sup> ade6-M210 leu1-32 ura4-     This study       D18 nda3-km311 h-     This study     This study       Figure S3     KGY16971     htp1-(1-280)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-     This study       KGY16971     htp1-(1-280)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-     This study       KGY16971     htp1-(1-280)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-     This study       KGY16971     htp1-(1-280)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-     This study       KGY16973     htp1-(K40R):kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-     This study       KGY17374     htp1-(K4		leu1-32 h- hhn1 (P3735 K3735) CEP::kan <sup>R</sup> hhn3::ura4 ura4 D18 lau1 22 h+	This study
Figure S1   KGY16343   hhp1-GFP:kan <sup>R</sup> hhp2-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-   This study     KGY16881   hhp1-mNG:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-   This study     Figure S2   KGY17901   hhp1-(1-296)-mNG:kan <sup>R</sup> sad1-mCherry:kan <sup>R</sup> ade6-M210 leu1-32 ura4-   This study     KGY17902   hhp1-(1-296)-mNG:kan <sup>R</sup> sad1-mCherry:kan <sup>R</sup> ade6-M210 leu1-32 ura4-   This study     D18 h-   KGY17902   hhp1-(1-296)-mNG:kan <sup>R</sup> sad1-mCherry:kan <sup>R</sup> ade6-M210 leu1-32 ura4-   This study     KGY17902   hhp1-(1-296)-mNG:kan <sup>R</sup> sad1-mCherry:kan <sup>R</sup> ade6-M210 leu1-32 ura4-   This study     KGY15971   hhp1-(1-280)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-   This study     KGY15971   hhp1-(1-280)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-   This study     KGY17079   hhp1-(1-280)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-   This study     KGY17079   hhp1-(1-280)-GFP:kan <sup>R</sup> hhp2::ura4 <sup>*</sup> ade6-M210 leu1-32 ura4-D18 h-   This study     KGY19337   hhp1-(K40R):kan <sup>R</sup> leu1-32 ura4-D18 h-   This study     KGY19342   hhp1-(K40R):kan <sup>R</sup> leu1-32 ura4-D18 h-   This study     KGY19342   hhp2-(K41R):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h-   This study     KGY19337   hhp1-(K40R):kan <sup>R</sup> leu1-32 ura4-D18 h-   This study	KGY14526	hhp1-(R261E)-GFP::kan <sup>R</sup> hhp2::ura4+ ade6-M210 ura4-D18 leu1-32 h+	This study This study
KGY163-3 KGY16783     hhp1-GFP:kan <sup>R</sup> hhp2-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h- hhp1-mNG:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h- This study     This study       Figure S2 KGY17901     hhp1-(1-296)-mNG:kan <sup>R</sup> sad1-mCherry:kan <sup>R</sup> ade6-M210 leu1-32 ura4- D18 h- hhp1-(1-296)-mNG:kan <sup>R</sup> sad1-mCherry:kan <sup>R</sup> ade6-M210 leu1-32 ura4- D18 ha- hhp1-(1-296)-mNG:kan <sup>R</sup> sad1-mCherry:kan <sup>R</sup> ade6-M210 leu1-32 ura4- D18 nda3-km311 h-     This study       Figure S3 KGY16143     hhp1-(1-280)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h- thp1-(1-280)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h- hhp1-(1-280)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h- thp1-(1-280)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h- this study h+     This study This study       Figure S4 KGY1079     hhp1-(1-280)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h- this study h+     This study This study       Figure S4 KGY19337     cki2-(f-278)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h- this study hp1-(K40R):kan <sup>R</sup> leu1-32 ura4-D18 h- this study     This study This study       Figure S6 KGY19342     cki2-GFP:kanR ade6-M210leu1-32 ura4-D18 h- this study hp1-(K40R):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h- this study     This study This study       Figure S6 KGY19324     cki2-GFP:kanR ade6-M210leu1-32 ura4-D18 h- this study hp1-(R261E):kan <sup>R</sup> hhp2-(K41R):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h- this study hp1-(R261E):kan <sup>R</sup> hhp2:ura4 <sup>R</sup> ade6-M210leu1-32 ura4-D18 h- this study hp1-(R261E):kan <sup>R</sup> hhp2:ura4 <sup>R</sup> ade6-M210leu1-32 ura4-D18 h- this study hp1-(R272E K273E):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h- this study hp1-(R272E K273E):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h- this study hp1-(R272E K273E):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h- this	Figure S1		
KGY16788   hhp1-mNG:kan <sup>®</sup> ade6-M210 leu1-32 ura4-D18 h-   This study     KGY16831   hhp2-mNG:kan <sup>®</sup> ade6-M210 leu1-32 ura4-D18 h-   This study     Figure S2   KGY17901   hhp1-(1-296)-mNG:kan <sup>®</sup> sad1-mCherry:kan <sup>®</sup> ade6-M210 leu1-32 ura4-   This study     KGY17902   hhp1-(1-296)-mNG:kan <sup>®</sup> sad1-mCherry:kan <sup>®</sup> ade6-M210 leu1-32 ura4-   This study     D18 h-   KGY17902   hhp1-(1-280)-GFP:kan <sup>®</sup> ade6-M210 leu1-32 ura4-D18 h-   This study     KGY15971   hhp1-(1-280)-GFP:kan <sup>®</sup> ade6-M210 leu1-32 ura4-D18 h-   This study     KGY1613   hhp2-(1-278)-GFP:kan <sup>®</sup> ade6-M210 leu1-32 ura4-D18 h-   This study     KGY17079   hhp1-(1-280)-GFP:kan <sup>®</sup> ade6-M210 leu1-32 ura4-D18 h-   This study     KGY17079   hhp1-(1-280)-GFP:kan <sup>®</sup> hp1:::ura4* ade6-M210 leu1-32 ura4-D18 h-   This study     KGY17079   hhp1-(1-280)-GFP:kan <sup>®</sup> hp1:::ura4* ade6-M210 leu1-32 ura4-D18 h-   This study     KGY17081   cki2-GFP:kan <sup>®</sup> hp2::ura4* ade6-M210 leu1-32 ura4-D18 h-   This study     KGY19337   hhp1-(K40R):kan <sup>®</sup> leu1-32 ura4-D18 h-   This study     KGY19349   hhp2-(K41R):kan <sup>®</sup> ade6-M210 leu1-32 ura4-D18 h-   This study     KGY19340   hhp1-(K40R):kan <sup>®</sup> id4-RFP:kan <sup>®</sup> ade6-M210 leu1-32 ura4-D18 h-   This study     KGY19342	KGY16343	hhp1-GFP:kan <sup>R</sup> hhp2-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18h+	This study
KGY16831   hhp2-mNG:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-   This study     Figure S2   KGY17901   hhp1-(1-296)-mNG:kan <sup>R</sup> sad1-mCherry:kan <sup>R</sup> ade6-M210 leu1-32 ura4-   This study     KGY17902   hhp1-(1-296)-mNG:kan <sup>R</sup> sad1-mCherry:kan <sup>R</sup> ade6-M210 leu1-32 ura4-   This study     D18 h-   KGY17902   hhp1-(1-296)-mNG:kan <sup>R</sup> sad1-mCherry:kan <sup>R</sup> ade6-M210 leu1-32 ura4-   This study     KGY17902   hhp1-(1-280)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-   This study     KGY16143   hhp2-(1-278)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-   This study     KGY17079   hhp1-(1-280)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-   This study     KGY17079   hhp1-(1-280)-GFP:kan <sup>R</sup> hhp2::ura4* ade6-M210 leu1-32 ura4-D18 h-   This study     KGY17079   hhp1-(K40R):kan <sup>R</sup> leu1-32 ura4-D18 h-   This study     KGY19337   hhp1-(K40R):kan <sup>R</sup> leu1-32 ura4-D18 h-   This study     KGY19340   hhp2-(K41R):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h-   This study     KGY19323   cki2-GFP:kanR ade6-M210leu1-32 ura4-D18 h-   This study     KGY19324   cki2-(1-429)-GFP:kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h-   This study     KGY19324   cki2-(1-429)-GFP:kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h-   This study     KGY19324   cki2-GFP:kan <sup>R</sup>	KGY16788	hhp1-mNG:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-	This study
Figure S2   hhp1-(1-296)-mNG:kan <sup>R</sup> sad1-mCherry:kan <sup>R</sup> ade6-M210 leu1-32 ura4- D18 h-   This study D18 h-     KGY17902   hhp1-(1-296)-mNG:kan <sup>R</sup> sad1-mCherry:kan <sup>R</sup> ade6-M210 leu1-32 ura4- D18 nda3-km311 h-   This study D18 nda3-km311 h-     Figure S3   KGY15971   hhp1-(1-280)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h- This study KGY16143   This study hhp2-(1-278)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h- This study hp1-(1-280)-GFP:kan <sup>R</sup> sid4-RFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h   This study This study hhp2-(1-278)-GFP:kan <sup>R</sup> hp2::ura4* ade6-M210 leu1-32 ura4-D18 h- This study h+     KGY17079   hhp1-(1-280)-GFP:kan <sup>R</sup> hp2::ura4* ade6-M210 leu1-32 ura4-D18 h- This study h+   This study This study     Figure S4   hhp1-(K40R):kan <sup>R</sup> leu1-32 ura4-D18 h- This study KGY19342   This study hhp2-(K41R):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h- This study     Figure S6   cki2-GFP:kanR ade6-M210leu1-32 ura4-D18 h- This study   This study This study     KGY17283   cki2-GFP:kanR ade6-M210leu1-32 ura4-D18 h- This study   This study This study     KGY19324   cki2-GFP:kanR ade6-M210leu1-32 ura4-D18 h- This study   This study     KGY19324   cki2-GFP:kanR ade6-M210leu1-32 ura4-D18 h- This study   This study     KGY19159   hhp1-(R261E):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h- This study   This study     KGY19159   hhp1-(R272E K273E):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h- This study   This study	KGY16831	hhp2-mNG:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-	This study
KGY17901   hhp1-(1-296)-mNG:kan <sup>R</sup> sad1-mCherry:kan <sup>R</sup> ade6-M210 leu1-32 ura4- D18 h-   This study D18 h-     KGY17902   hhp1-(1-296)-mNG:kan <sup>R</sup> sad1-mCherry:kan <sup>R</sup> ade6-M210 leu1-32 ura4- D18 nda3-km311 h-   This study D18 nda3-km311 h-     Figure S3   KGY15971   hhp1-(1-280)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h- thp2-(1-278)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h- thp1-(1-280)-GFP:kan <sup>R</sup> sid4-RFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h+   This study hp1-(1-280)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h- this study hp2-(1-278)-GFP:kan <sup>R</sup> hp2::ura4* ade6-M210 leu1-32 ura4-D18 h- this study KGY1079   This study hp1-(1-280)-GFP:kan <sup>R</sup> hp2::ura4* ade6-M210 leu1-32 ura4-D18 h- this study     Figure S4   KGY19337   hhp1-(K40R):kan <sup>R</sup> leu1-32 ura4-D18 h- this study hp2-(K41R):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h- this study   This study hp1-(K40R):kan <sup>R</sup> hp2-(K41R):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h+ this study     Figure S6   KGY19323   cki2-GFP:kanR ade6-M210leu1-32 ura4-D18 h- this study   This study hp1-(R261E):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h- this study     KGY19324   cki2-GFP:kanR sid4-RFP:kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h- this study   This study hp1-(R261E):kan <sup>R</sup> hp2::ura4 <sup>*</sup> leu1-32 ura4-D18 h- this study     KGY19159   hhp1-(R261E):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h- this study   This study hp1-(R261E):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h- this study     KGY19434   hhp2-GFP:kan <sup>R</sup> sid4-SA1 ade6-M210leu1-32 ura4-D18 h- this study   This study hp1-(R272E K273E):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h- this study </td <td>Figure S2</td> <td></td> <td></td>	Figure S2		
KGY17902   hhpf-(1-296)-mNG:kan <sup>R</sup> sad1-mCherry:kan <sup>R</sup> ade6-M210 leu1-32 ura4- D18 nda3-km311 h-   This study     Figure S3   KGY15971   hhp1-(1-280)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h- This study   This study     KGY15141   hhp2-(1-278)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h- This study   This study     KGY19157   hhp1-(1-280)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h- This study   This study     KGY19157   hhp1-(1-280)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h- This study   This study     KGY17079   hhp1-(1-280)-GFP:kan <sup>R</sup> hp2::ura4*ade6-M210 leu1-32 ura4-D18 h- This study   This study     KGY10337   hhp1-(K40R):kan <sup>R</sup> leu1-32 ura4-D18 h- This study   This study     Figure S4   KGY19342   hhp1-(K40R):kan <sup>R</sup> leu1-32 ura4-D18 h- This study   This study     KGY19342   hhp1-(K40R):kan <sup>R</sup> leu1-32 ura4-D18 h- This study   This study     Figure S6   KGY17283   cki2-GFP:kanR ade6-M210leu1-32 ura4-D18 h- This study   This study     KGY19323   cki2-GFP:kanR ade6-M210leu1-32 ura4-D18 h- This study   This study     KGY19324   cki2-GFP:kanR ade6-M210leu1-32 ura4-D18 h- This study   This study     KGY19324   cki2-GFP:kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h- This study   This study     KGY19324   cki2-GFP:kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h-	KGY17901	hhp1-(1-296)-mNG:kan <sup>k</sup> sad1-mCherry:kan <sup>k</sup> ade6-M210 leu1-32 ura4- D18 h-	This study
Figure S3   hhp1-(1-280)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-   This study     KGY15971   hhp1-(1-280)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-   This study     KGY11157   hhp1-(1-280)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-   This study     KGY17079   hhp1-(1-280)-GFP:kan <sup>R</sup> sid4-RFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-   This study     KGY17079   hhp1-(1-280)-GFP:kan <sup>R</sup> hp2::ura4*ade6-M210 leu1-32 ura4-D18 h-   This study     KGY18869   hhp1-(1-278)-GFP:kan <sup>R</sup> hp1::ura4*ade6-M210 leu1-32 ura4-D18 h-   This study     Figure S4   KGY19337   hhp1-(K40R):kan <sup>R</sup> leu1-32 ura4-D18 h-   This study     KGY19342   hhp1-(K40R):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h+   This study     KGY17283   cki2-GFP:kanR ade6-M210leu1-32 ura4-D18 h-   This study     KGY17284   cki2-GFP:kanR ade6-M210leu1-32 ura4-D18 h-   This study     KGY19324   cki2-GFP:kanR ade6-M210leu1-32 ura4-D18 h-   This study     KGY19324   cki2-GFP:kanR ade6-M210leu1-32 ura4-D18 h-   This study     KGY19324   cki2-GFP:kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h-   This study     KGY19159   hhp1-(R261E):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h-   This study     KGY19344   cki2-GFP:kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h-   This study <td>KGY17902</td> <td>hhp1-(1-296)-mNG:kan<sup>R</sup>sad1-mCherry:kan<sup>R</sup>ade6-M210 leu1-32 ura4- D18 nda3-km311 h-</td> <td>This study</td>	KGY17902	hhp1-(1-296)-mNG:kan <sup>R</sup> sad1-mCherry:kan <sup>R</sup> ade6-M210 leu1-32 ura4- D18 nda3-km311 h-	This study
KGY15971   hhp1-(1-280)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-   This study     KGY16143   hhp1-(1-280)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-   This study     KGY19157   hhp1-(1-280)-GFP:kan <sup>R</sup> sid4-RFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-   This study     KGY17079   hhp1-(1-280)-GFP:kan <sup>R</sup> hp1::ura4*ade6-M210 leu1-32 ura4-D18 h-   This study     KGY16869   hhp1-(1-278)-GFP:kan <sup>R</sup> hp2::ura4*ade6-M210 leu1-32 ura4-D18 h-   This study     KGY19337   hhp1-(K40R):kan <sup>R</sup> leu1-32 ura4-D18 h-   This study     KGY19349   hhp2-(K41R):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h+   This study     KGY19342   hhp1-(K40R):kan <sup>R</sup> hp2-(K41R):kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h+   This study     KGY17283   cki2-GFP:kanR ade6-M210leu1-32 ura4-D18 h-   This study     KGY17283   cki2-GFP:kanR ade6-M210leu1-32 ura4-D18 h-   This study     KGY1324   cki2-GFP:kanR ade6-M210leu1-32 ura4-D18 h-   This study     KGY19323   cki2-GFP:kanR ade6-M210leu1-32 ura4-D18 h-   This study     KGY19324   cki2-GFP:kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h-   This study     KGY19159   hhp1-(R261E):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h-   This study     KGY19159   hhp1-(R261E):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h-   This study	Figure S3		
KGY16143   hhp2-(1-278)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h- hp1-(1-280)-GFP:kan <sup>R</sup> sid4-RFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h+   This study h+     KGY17079   hhp1-(1-280)-GFP:kan <sup>R</sup> hp2::ura4*ade6-M210 leu1-32 ura4-D18 h- hp1-(1-280)-GFP:kan <sup>R</sup> hp1::ura4*ade6-M210 leu1-32 ura4-D18 h- hp2-(1-278)-GFP:kan <sup>R</sup> hp1::ura4*ade6-M210 leu1-32 ura4-D18 h- this study   This study his study     Figure S4   KGY19337   hhp1-(K40R):kan <sup>R</sup> leu1-32 ura4-D18 h- this study   This study hhp2-(K41R):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h- this study   This study hhp1-(K40R):kan <sup>R</sup> hp2-(K41R):kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h+ this study     Figure S6   KGY17283   cki2-GFP:kanR ade6-M210leu1-32 ura4-D18 h- this study   This study this study     KGY19323   cki2-GFP:kanR ade6-M210leu1-32 ura4-D18 h- this study   This study     KGY19324   cki2-(1-429)-GFP:kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h- this study   This study     KGY19323   cki2-(1-29)-GFP:kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h- this study   This study     KGY19324   cki2-(1-29)-GFP:kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h- thip1-(R261E):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h- this study   This study     KGY19159   hhp1-(R272E K273E):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h- this study   This study     KGY19344   hhp1-(R272E K273E):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h- this study   This study     KGY19443   h+   This study   This study	KGY15971	hhp1-(1-280)-GFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h-	This study
KGY19157   hhp1-(1-280)-GFP:kan <sup>R</sup> sid4-RFP:kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 hhp1-(1-280)-GFP:kan <sup>R</sup> hhp2::ura4* ade6-M210 leu1-32 ura4-D18 hhp1-(1-280)-GFP:kan <sup>R</sup> hhp2::ura4* ade6-M210 leu1-32 ura4-D18 hhp1: study   This study     KGY10869   hhp1-(1-280)-GFP:kan <sup>R</sup> hhp2::ura4* ade6-M210 leu1-32 ura4-D18 hhp1: study   This study     Figure S4   KGY19337   hhp1-(K40R):kan <sup>R</sup> leu1-32 ura4-D18 hhp1::ura4* ade6-M210 leu1-32 ura4-D18 hhp1: study   This study     KGY19349   hhp2-(K41R):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 hhp1:(K40R):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 hhp1:(K40R):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 hhp1:(K40R):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 hhp1: study   This study     Figure S6   cki2-GFP:kanR ade6-M210leu1-32 ura4-D18 hhp1:(K40R):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 hhp1: study   This study     KGY17283   cki2-GFP:kanR ade6-M210leu1-32 ura4-D18 hhp1: study   This study     KGY19323   cki2-GFP:kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 hhp1: study   This study     KGY19324   chi2-(1-429)-GFP:kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 hhp1: study   This study     KGY19324   chi2-(1-429)-GFP:kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 hhp1: study   This study     KGY19344   hhp1-(R261E):kan <sup>R</sup> hhp2::ura4* leu1-32 ura4-D18 hhp1: study   This study     KGY19344   hhp1-(R272E K273E):kan <sup>R</sup> hhp2::ura4* ade6-M210leu1-32 ura4-D18 hhp1: study   This study     KGY19344   hhp2-GFP:kan <sup>R</sup> si	KGY16143	hhp2-(1-278)-GFP:kan <sup>k</sup> ade6-M210 leu1-32 ura4-D18 h-	This study
KGY17079   hhp1-(1-280)-GFP:kan <sup>R</sup> hhp2::ura4 <sup>+</sup> ade6-M210 leu1-32 ura4-D18 h- hp2-(1-278)-GFP:kan <sup>R</sup> hhp1::ura4 <sup>+</sup> ade6-M210 leu1-32 ura4-D18 h-   This study     Figure S4   KGY19337   hhp1-(K40R):kan <sup>R</sup> leu1-32 ura4-D18 h- hp2-(K41R):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h+   This study     KGY19349   hhp2-(K41R):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h+ hp1-(K40R):kan <sup>R</sup> hhp2-(K41R):kan <sup>R</sup> ade6-M210 leu1-32 ura4-D18 h+   This study     Figure S6   KGY17283   cki2-GFP:kanR ade6-M210leu1-32 ura4-D18 h- this study   This study     KGY17283   cki2-GFP:kanR ade6-M210leu1-32 ura4-D18 h- this study   This study     KGY17283   cki2-GFP:kanR ade6-M210leu1-32 ura4-D18 h- this study   This study     KGY19323   cki2-GFP:kanR ade6-M210leu1-32 ura4-D18 h- this study   This study     KGY19324   cki2-(1-429)-GFP:kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h- thip1-(R261E):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h- thip1-(R261E):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h- this study   This study     KGY19159   hhp1-(R272E K273E):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h- this study   This study     KGY19344   hhp1-(R272E K273E):kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h- this study   This study     KGY19443   h+   This study   This study     KGY19443   h+   This study   This study	KGY19157	hhp1-(1-280)-GFP:kan <sup>~</sup> sid4-RFP:kan <sup>~</sup> ade6-M210 leu1-32 ura4-D18 h+	This study
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KGY19324 $cki2-(1-429)-GFP:kan^R$ sid4-RFP:kan^R ade6-M210leu1-32 ura4-D18h- hhp1-(R261E):kan^Rade6-M210leu1-32 ura4-D18 h- KGY19159This study This study KGY18807 hhp1-(R272E K273E):kan^Rade6-M210leu1-32 ura4-D18 h- This study KGY19344 KGY19344 KGY19443This study This study This study This study This study This study This study KGY19443Figure S7 KGY14155hhp2-GFP:kan^R sid4-SA1 ade6-M210leu1-32 ura4-D18h+ hhp2-GFP:kan^R leu1::pJK148-nmt81-ppc89 ppc89::ura4*ade6- M210leu1-32 ura4*ade6-This study This study This study This study This study	KGY19323	cki2-GFP:kanRsid4-RFP:kan <sup>R</sup> ade6-M210leu1-32 ura4-D18h-	This study
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KGY19344hhp1-(R272E K273E):kan <sup>R</sup> hhp2::ura4*ade6-M210leu1-32 ura4-D18This studyKGY19443h+This studyFigure S7hhp2-GFP:kan <sup>R</sup> sid4-SA1 ade6-M210leu1-32 ura4-D18h+KGY14155hhp2-GFP:kan <sup>R</sup> leu1::pJK148-nmt81-ppc89 ppc89::ura4*ade6-This studyThis study	KGY18807	hhp1-(R201E).kaii 1111p2ula4 leu1-32 ula4-D1011? hhp1-(R272E K273E).kan <sup>R</sup> ade6-M210leu1-32 ura4-D18 h-	This study
KGY19443 $h+$ This studyFigure S7hhp2-GFP:kan <sup>R</sup> sid4-SA1 ade6-M210leu1-32 ura4-D18h+ hhp2-GFP:kan <sup>R</sup> leu1::pJK148-nmt81-ppc89 ppc89::ura4 <sup>+</sup> ade6-This study	KGY19344	hhp1-(R272E K273E):kan <sup>R</sup> hhp2::ura4 <sup>+</sup> ade6-M210leu1-32 ura4-D18	This study
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	FIGULE SI	nnp2-GFP:kan_sla4-SA1_adeo-M210leU1-32_Ufa4-D18n+ hbn2-GFP:kan <sup>R</sup> leu1::n_lK148-nmt81-nnc80_nnc80::ura4 <sup>+</sup> ade6	This study
KGY19398 M210N+ Ihis study	KGY19398	M22 GFT	This study