Supplementary online materials

Supplementary Table 1

The effects of GdnHCl treatment and *HSP104* disruption on [*SWI*$^+$]

treatment	number of colonies		
	Ade$^+$	Raf$^+$	YPD
5 mM GdnHCl:			
[*PSI*$^+$][*SWI*$^+$]	0	22	22
[*PSI*$^+$][*swi*$^-$]	0	15	15
[*psi*$^-$][*SWI*$^+$]	0	88	88
[*psi*$^-$][*swi*$^-$]	0	13	13
***hsp104Δ*:**			
[*PSI*$^+$][*SWI*$^+$]	0	47	47
[*PSI*$^+$][*swi*$^-$]	0	18	18
[*psi*$^-$][*SWI*$^+$]	0	59	59
[*psi*$^-$][*swi*$^-$]	0	11	11
non-GdnHCl (wt):			
[*PSI*$^+$][*SWI*$^+$]	48	0	48
[*PSI*$^+$][*swi*$^-$]	33	33	33
[*psi*$^-$][*SWI*$^+$]	0	0	125
[*psi*$^-$][*swi*$^-$]	0	24	24

Individual colonies of [*PSI*$^+$][*SWI*$^+$], [*PSI*$^+$][*swi*$^-$], [*psi*$^-$][*SWI*$^+$], and [*psi*$^-$][*swi*$^-$] that had been treated with or without 5 mM GdnHCl or undergone *HSP104* disruption were streaked on SC-adenine, SC +raffinose +antimycin, and YPD plates in parallel. After 3 days incubation at 30^{o}C, their ability to grow on the indicated media were examined. Ade$^+$ and Raf$^+$ indicate [*PSI*$^+$] and [*swi*$^-$], respectively.

Supplementary Table 2
The effect of *HSP104* overexpression on [*SWI*$^+$] - (a)

		number of colonies			percentage(%)	
		Ade$^+$	Raf$^+$	YPD	Ade$^+$	Raf$^+$
[*PSI*$^+$][*SWI*$^+$], *HSP104* ↑	colony 1	94	47	264	35.6	17.8
	colony 2	87	37	251	34.7	14.7
	colony 3	139	29	305	45.6	9.5
	colony 4	132	36	318	41.5	11.3
Average of colony 1-4					39.3±5.1	13.3±3.7
[*PSI*$^+$][*SWI*$^+$], vector	colony 1	741	0	737	100.5	0.0
	colony 2	746	0	751	99.3	0.0
	colony 3	669	0	692	96.7	0.0
Average of colony 1-3					98.9±2.0	0.0±0.0
[*PSI*$^+$][*swi*$^-$], *HSP104* ↑	colony 1	184	619	621	29.6	99.7
	colony 2	151	477	474	31.9	100.6
	colony 3	342	807	804	42.5	100.4
Average of colony 1-3					34.7±6.9	100.2±0.5
[*PSI*$^+$][*swi*$^-$], vector	colony 1	644	656	659	97.7	99.5
	colony 2	130	131	128	101.6	102.3
	colony 3	1109	1116	1120	99.0	99.6
Average of colony 1-3					99.4±2.0	100.5±1.6
[*psi*$^-$][*SWI*$^+$], *HSP104* ↑	colony 1	0	0	556	0.0	0.0
	colony 2	0	0	436	0.0	0.0
	colony 3	0	1	1152	0.0	0.1
	colony 4	0	0	316	0.0	0.0
	colony 5	0	0	456	0.0	0.0
Average of colony 1-5					0.0±0.0	0.0±0.0
[*psi*$^-$][*SWI*$^+$], vector	colony 1	0	1	2340	0.0	0.0
	colony 2	0	0	780	0.0	0.0
Average of colony 1-2					0.0±0.0	0.0±0.0
[*psi*$^-$][*swi*$^-$], *HSP104* ↑	colony 1	0	459	464	0.0	98.9
	colony 2	0	531	528	0.0	100.6
	colony 3	0	357	368	0.0	97.0
Average of colony 1-3					0.0±0.0	98.8±1.8
[*psi*$^-$][*swi*$^-$], vector	colony 1	0	776	788	0.0	98.5
	colony 2	0	334	338	0.0	98.8
	colony 3	0	554	548	0.0	101.1
Average of colony 1-3					0.0±0.0	99.5±1.4

(a) Fresh transformants carrying the *HSP104*-expression plasmid, *p2HG-HSP104,* or empty vector, *p2HG*, were resuspended in SC-histidine medium. Equal numbers of cells were spread on SC-adenine, SC+raffinose+antimycin, and YPD plates. After 3 days incubation, the number of colonies on SC-ade, raffinose, and YPD were counted. Ade$^+$ and Raf$^+$ indicate [*PSI*$^+$] and [*swi*$^-$], respectively.

The effect of *HSP104* overexpression on [*SWI*$^+$] - (b)

		colony number			percentage(%)	
		Ade$^+$	Raf$^+$	YPD	Ade$^+$	Raf$^+$
[*PSI*$^+$][*SWI*$^+$], *HSP104* ↑	colony 1	4	73	227	1.8	32.2
	colony 2	6	62	297	2.0	20.9
	colony 4	20	61	493	4.1	12.4
	colony 5	8	93	475	1.7	19.6
Average of colony 1-4					2.4±1.1	21.2±8.2
[*PSI*$^+$][*SWI*$^+$], vector	colony 1	461	0	457	100.9	0.0
	colony 2	552	0	560	98.6	0.0
	colony 3	476	0	492	96.7	0.0
Average of colony 1-4					98.7±2.1	0.0±0.0
[*psi*$^-$][*SWI*$^+$], *HSP104* ↑	colony 1	0	0	456	0.0	0.0
	colony 2	0	0	340	0.0	0.0
	colony 3	0	0	241	0.0	0.0
	colony 4	0	0	117	0.0	0.0
	colony 5	0	0	231	0.0	0.0
Average of colony 1-5					0.0±0.0	0.0±0.0
[*psi*$^-$][*SWI*$^+$], vector	colony 1	0	0	536	0.0	0.0
	colony 2	0	0	1124	0.0	0.0
Average of colony 1-5					0.0±0.0	0.0±0.0

(b) Transformants carrying the *HSP104* expression plasmid, *p2HG-HSP104,* or the empty vector, *p2HG*, were resuspended in SC-histidine medium and grown overnight at 30^{o}C before spreading on SC-Adenine, SC+raffinose+antimycin and YPD plates. After 3 days incubation, the number of colonies on SC-ade, raffinose, and YPD were counted. Ade$^+$ and Raf$^+$ indicate [*PSI*$^+$] and [*swi*$^-$], respectively.

The effect of *HSP104* overexpression on [*SWI*$^+$] - (c)

	[*PSI*$^+$]			[*psi*$^-$]		
	[*SWI*$^+$]	[*swi*$^-$]	mixture*	[*SWI*$^+$]	[*swi*$^-$]	mixture*
[*PSI*$^+$][*SWI*$^+$], *HSP104* ↑	34	0	2	7	8	44
vector	10	0	0	0	0	0
[*PSI*$^+$][*swi*$^-$], *HSP104* ↑	0	7	0	0	7	0
vector	0	7	0	0	0	0
[*psi*$^-$][*SWI*$^+$], *HSP104* ↑	0	0	0	9	0	0
vector	0	0	0	8	0	0
[*psi*$^-$][*swi*$^-$], *HSP104* ↑	0	0	0	0	8	0
vector	0	0	0	0	8	0

(c) Transformants carrying the *HSP104* expression plasmid, *p2HG-HSP104,* or the empty vector, *p2HG*, were streaked on YPD plates. Individual white ([*PSI*$^+$]) or red ([*psi*$^-$]) coloinies were subsequently re-streaked on SC+raffinose+antimycin to check their [*SWI*$^+$] status. *mixture denotes that both [*SWI*$^+$] and [*swi*$^-$] cells were obtained as mixed populations.

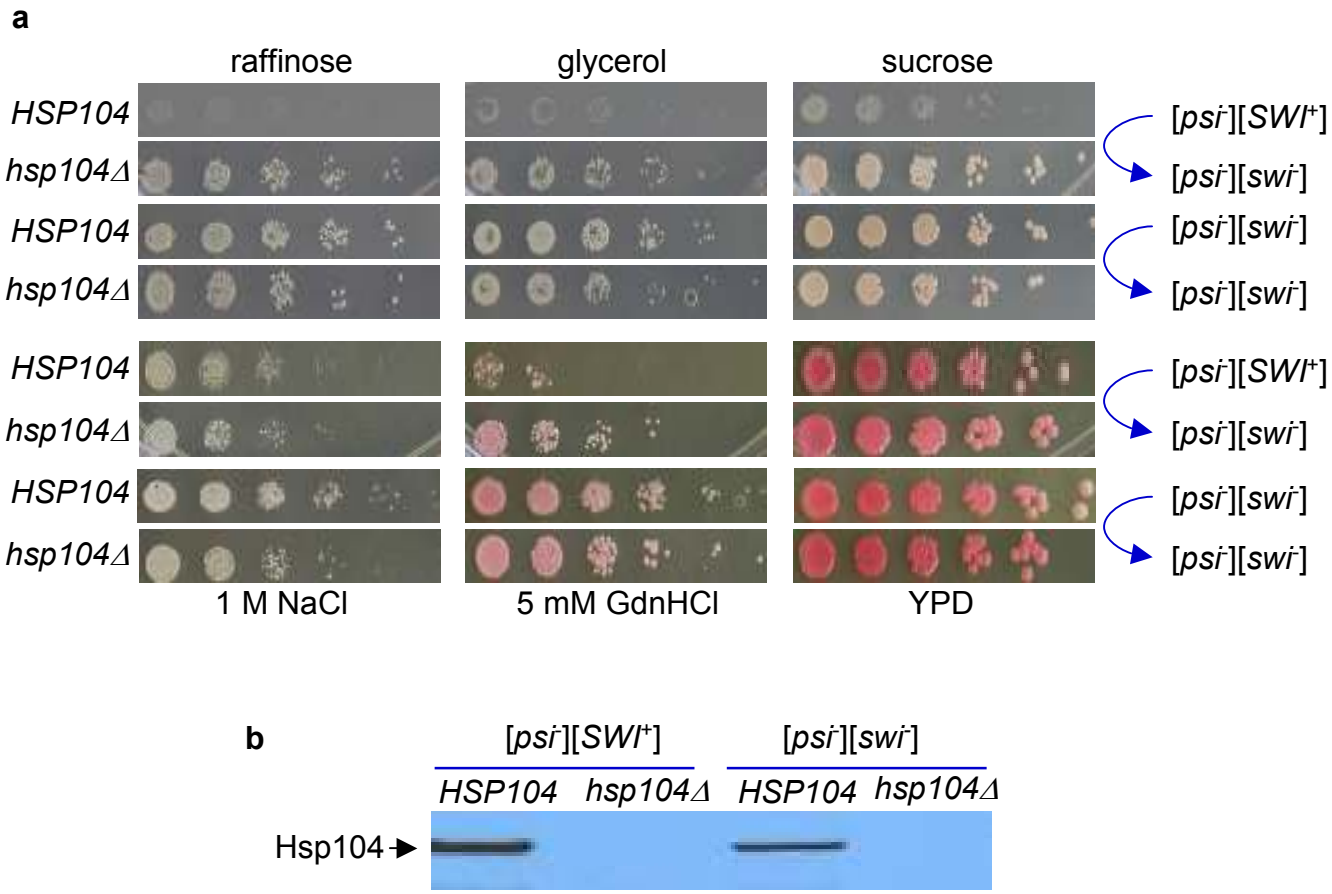
Supplementary Table 3

Cytoduction efficiency of [*SWI*$^+$]

74D-694 donor of	c10B-H49 cytoductants		
	Total	[*SWI*$^+$]	[*SWI*$^+$] (%)
[*PSI*$^+$][*SWI*$^+$]	35*	31	88.6
[*psi*$^-$][*SWI*$^+$]	86	42	48.8

This is a summary of 3 independent cytoduction experiments. * Ten [*PSI*$^+$] cytoductants were randomly picked and examined . Nine were confirmed as [*PSI*$^+$], representing a [*PSI*$^+$] cytoduction rate of 90%.

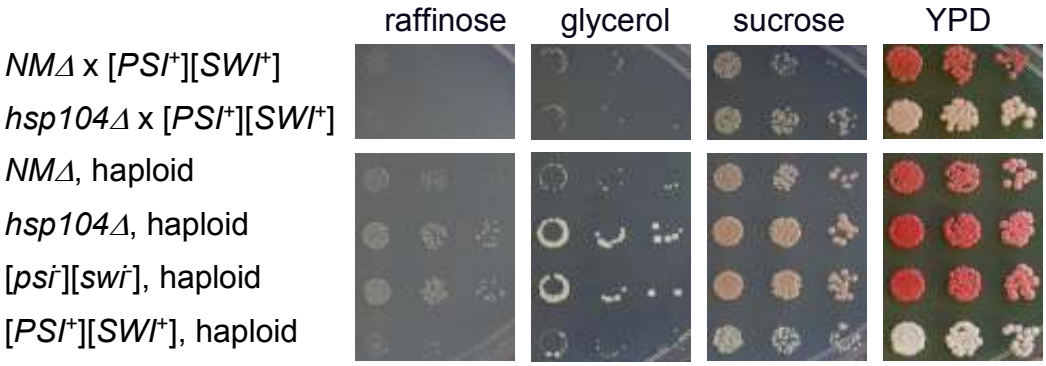
Supplementary Figure 1



Supplementary Figure 1 The effect of *HSP104* disruption on [*psi*$^-$][*SWI*$^+$]. **(a)** [*psi*$^-$][*SWI*$^+$] and [*psi*$^-$][*swi*$^-$] 74D-694, as well as their *HSP104* deletion derivatives were grown in YPD to mid-log phase and spotted to the indicated plates with a 5-fold serial dilution. **(b)** Immunoblot analysis to verify that *HSP104* was not expressed in the examined *HSP104* disruption strains.

Supplementary Figure 2

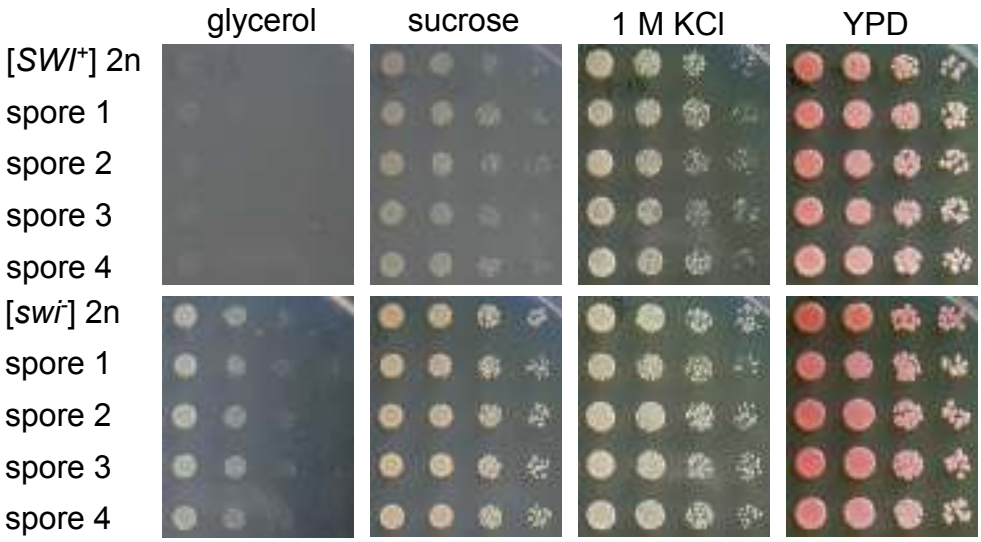
a



b

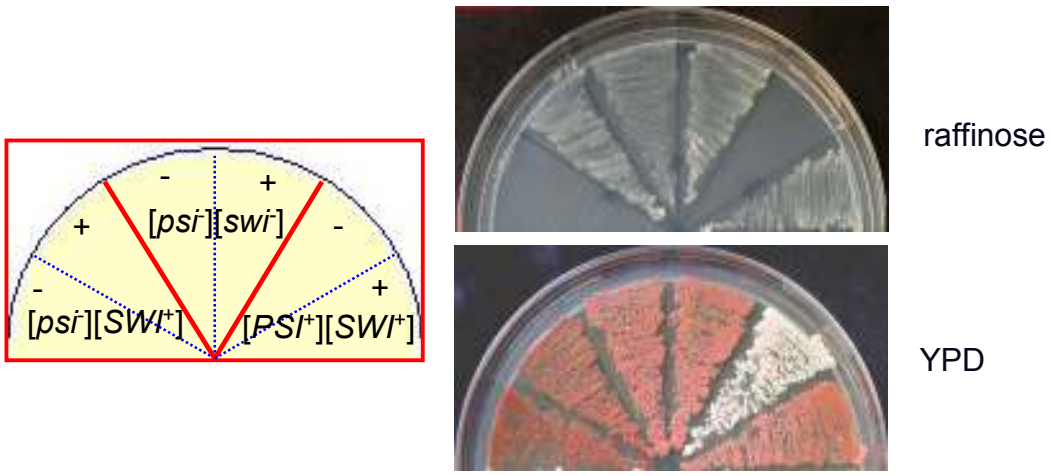
Supplementary Figure 2 [*SWI*$^+$] is dominantly inherited. **(a)** Phenotypic assay of [*SWI*$^+$] diploids resulting from the crosses of **a** cells of 74D-694 ([*PSI*$^+$][*SWI*$^+$]) to **α** cells of isogenic strains of *NMΔ-SUP35* ([*psi*$^-$][*swi*$^-$]) or *hsp104::LEU2* ([*psi*$^-$][*swi*$^-$]). Cells were grown to mid-log phase and spotted to the indicated plates with a 5-fold serial dilution. Included are their corresponding haploid parents. Pictures were taken after 5 days incubation at 30ºC. **(b)** [*SWI*$^+$] diploids from various outcrosses displayed the GdnHCl-curable Raf$^-$ phenotype. Shown here are cell streaks of diploids from 74D-694-[*psi*$^-$][*SWI*$^+$] x 74D-694-[*psi*$^-$][*swi*$^-$] (74D 2n), 74D-694-[*PSI*$^+$][*SWI*$^+$] x c10B-H49 (74D⊗10B), and c10B-H49 [*psi*$^-$][*SWI*$^+$] x S288C (10B⊗BY) on the indicated media. - and + represent with or without 5 mM GdnHCl treatment.

Supplementary Figure 3



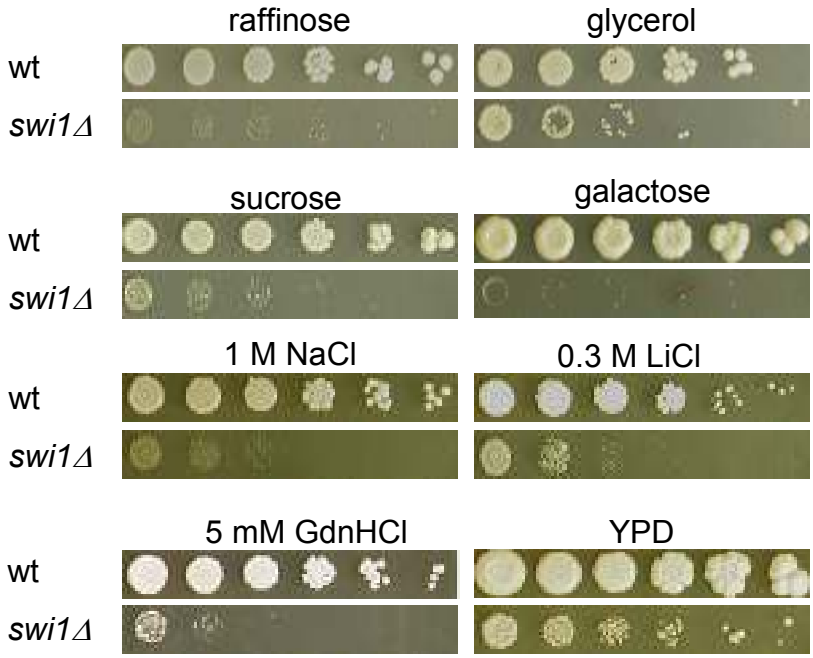
Supplementary Figure 3 Phenotypic assays of 74D-694 [*psi*$^-$][*SWI*$^+$] diploids and their meiotic progenies. Shown here are representative sets of spores generated from 74D-694 [*psi*$^-$][*SWI*$^+$] cells (2n) spotted on the indicated plates. Phenotypes on raffinose are shown in **Figure 4b**.

Supplementary Figure 4



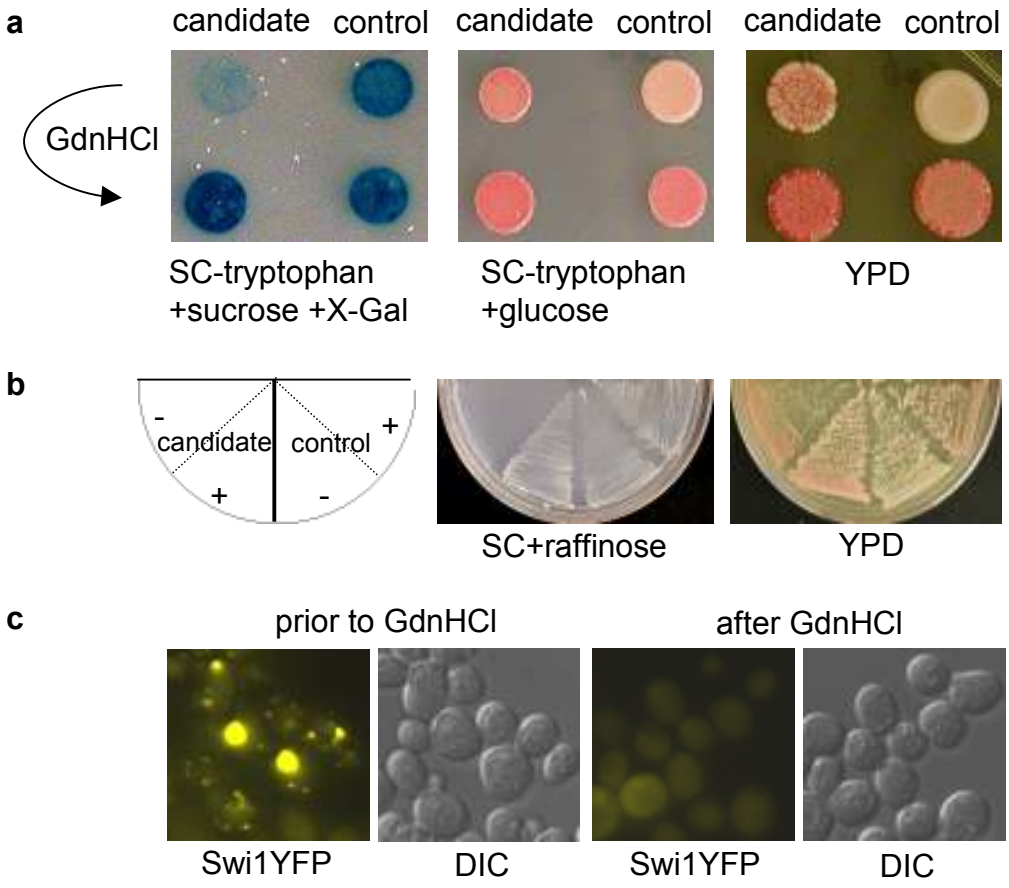
Supplementary Figure 4 [*SWI*$^{+}$] cytoductants of c10B-H49 exhibit the GdnHCl-curable Raf^{-} phenotype. Shown here are streaks of c10B-H49 cells with indicated prion backgrounds, prior to (-) and after (+) 5 mM GdnHCl treatment.

Supplementary Figure 5



Supplementary Figure 5 Selective phenotypes of a *swi1* null mutant in S288C. Wild-type (wt) and *SWI1* deletion (*swi1Δ)* yeast cells were grown in YPD to mid-log phase and spotted onto indicated plates. Shown here are 5-fold serial dilutions from a starting density of 10^6 cells/ml. Pictures were taken after 5-day incubation in 30^{o}C.

Supplementary Figure 6



Supplementary Figure 6 Swi1 is able to undergo inheritable changes in conformation without Swi1 overproduction. 74D-694 [*PSI*$^+$] [*PIN*$^+$][*swi*$^-$] cells were transformed with *pLS7*, a *cen*-plasmid carrying a *lacZ* reporter gene whose expression requires functional SWI/SNF complex. Forty-eight randomly picked transformants were streaked onto -tryptophan selective plates with or without 5 mM GdnHCl followed by replica-plating to -tryptophan+sucrose +X-Gal plate to check the reporter activity. Two transformants showed significant color changes upon GdnHCl treatment, from light blue to deep blue. Upon re-streaking, 8 colonies with strong color changes were subsequently picked from the population of the two transformants and re-checked for their GdnHCl-affected reporter activities. Three isolates that retained [*SWI*$^+$]-like color changes on X-Gal plates were picked for further studies. Shown here are representative data collected from one of the three isolates: GdnHCl dependent changes in pLS7 reporter activity (**a**), Raf$^-$ phenotype (**b**), and Swi1YFP aggregation (**c**). Candidate: [*SWI*$^+$] candidate; control: parental cells of 74D-694 [*PSI*$^+$] [*PIN*$^+$][*swi*$^-$]; -: without GdnHCl treatment. +: after GdnHCl treatment. Please note, [*PSI*$^+$] became unstable in the [*SWI*$^+$] candidates, displaying a mixed population of [*PSI*$^+$] and [*psi*$^-$] cells. Please also note, we attempted several similar experiments without success before this experiment. Therefore, the rate of [*SWI*$^+$] occurrence remains to be determined.