

Table S3. Yeast Strains

| No.                     | Strain          | Genotype  |
|-------------------------|-----------------|---|
|                         | Y7092 (KWY2457) | MAT $\alpha$ can1 $\Delta$ ::pSTE2-spHIS5 lyp1 $\Delta$ his3 $\Delta$ 1 leu2 $\Delta$ 0 ura3 $\Delta$ 0 met15 $\Delta$ 0  |
| <b>ChrII wt strains</b> |                 |   |
| Pos 1                   | KWY3354         | MAT $\alpha$ can1 $\Delta$ ::pSTE2-spHIS5 lyp1 $\Delta$ his3 $\Delta$ 1 leu2 $\Delta$ 0 ura3 $\Delta$ 0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ybl101c $\Delta$ ::LacO256::LEU2 |
| Pos 2                   | KWY3355         | MAT $\alpha$ can1 $\Delta$ ::pSTE2-spHIS5 lyp1 $\Delta$ his3 $\Delta$ 1 leu2 $\Delta$ 0 ura3 $\Delta$ 0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ybl083c $\Delta$ ::LacO256::LEU2 |
| Pos 3                   | KWY3356         | MAT $\alpha$ can1 $\Delta$ ::pSTE2-spHIS5 lyp1 $\Delta$ his3 $\Delta$ 1 leu2 $\Delta$ 0 ura3 $\Delta$ 0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ybl044w $\Delta$ ::LacO256::LEU2 |
| Pos 4                   | KWY3357         | MAT $\alpha$ can1 $\Delta$ ::pSTE2-spHIS5 lyp1 $\Delta$ his3 $\Delta$ 1 leu2 $\Delta$ 0 ura3 $\Delta$ 0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ybl017c $\Delta$ ::LacO256::LEU2 |
| Pos 5                   | KWY3358         | MAT $\alpha$ can1 $\Delta$ ::pSTE2-spHIS5 lyp1 $\Delta$ his3 $\Delta$ 1 leu2 $\Delta$ 0 ura3 $\Delta$ 0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ybl012c $\Delta$ ::LacO256::LEU2 |
| Pos 6                   | KWY3359         | MAT $\alpha$ can1 $\Delta$ ::pSTE2-spHIS5 lyp1 $\Delta$ his3 $\Delta$ 1 leu2 $\Delta$ 0 ura3 $\Delta$ 0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ybl001c $\Delta$ ::LacO256::LEU2 |
| Pos 7                   | KWY3361         | MAT $\alpha$ can1 $\Delta$ ::pSTE2-spHIS5 lyp1 $\Delta$ his3 $\Delta$ 1 leu2 $\Delta$ 0 ura3 $\Delta$ 0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ybr016w $\Delta$ ::LacO256::LEU2 |
| Pos 8                   | KWY3362         | MAT $\alpha$ can1 $\Delta$ ::pSTE2-spHIS5 lyp1 $\Delta$ his3 $\Delta$ 1 leu2 $\Delta$ 0 ura3 $\Delta$ 0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ybr022w $\Delta$ ::LacO256::LEU2 |
| Pos 9                   | KWY3363         | MAT $\alpha$ can1 $\Delta$ ::pSTE2-spHIS5 lyp1 $\Delta$ his3 $\Delta$ 1 leu2 $\Delta$ 0 ura3 $\Delta$ 0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ybr046c $\Delta$ ::LacO256::LEU2 |
| Pos 10                  | KWY3364         | MAT $\alpha$ can1 $\Delta$ ::pSTE2-spHIS5 lyp1 $\Delta$ his3 $\Delta$ 1 leu2 $\Delta$ 0 ura3 $\Delta$ 0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ybr071w $\Delta$ ::LacO256::LEU2 |
| Pos 11                  | KWY4019         | MAT $\alpha$ can1 $\Delta$ ::pSTE2-spHIS5 lyp1 $\Delta$ his3 $\Delta$ 1 leu2 $\Delta$ 0 ura3 $\Delta$ 0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ybr093c $\Delta$ ::LacO256::LEU2 |
| Pos 12                  | KWY3947         | MAT $\alpha$ can1 $\Delta$ ::pSTE2-spHIS5 lyp1 $\Delta$ his3 $\Delta$ 1 leu2 $\Delta$ 0 ura3 $\Delta$ 0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ybr120c $\Delta$ ::LacO256::LEU2 |
| Pos 14                  | KWY3366         | MAT $\alpha$ can1 $\Delta$ ::pSTE2-spHIS5 lyp1 $\Delta$ his3 $\Delta$ 1 leu2 $\Delta$ 0 ura3 $\Delta$ 0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ybr172c $\Delta$ ::LacO256::LEU2 |
| Pos 15                  | KWY3367         | MAT $\alpha$ can1 $\Delta$ ::pSTE2-spHIS5 lyp1 $\Delta$ his3 $\Delta$ 1 leu2 $\Delta$ 0 ura3 $\Delta$ 0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ybr203w $\Delta$ ::LacO256::LEU2 |
| Pos 16                  | KWY3368         | MAT $\alpha$ can1 $\Delta$ ::pSTE2-spHIS5 lyp1 $\Delta$ his3 $\Delta$ 1 leu2 $\Delta$ 0 ura3 $\Delta$ 0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ybr230c $\Delta$ ::LacO256::LEU2 |
| Pos 17                  | KWY3369         | MAT $\alpha$ can1 $\Delta$ ::pSTE2-spHIS5 lyp1 $\Delta$ his3 $\Delta$ 1 leu2 $\Delta$ 0 ura3 $\Delta$ 0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ybr258c $\Delta$ ::LacO256::LEU2 |
| Pos 18                  | KWY3370         | MAT $\alpha$ can1 $\Delta$ ::pSTE2-spHIS5 lyp1 $\Delta$ his3 $\Delta$ 1 leu2 $\Delta$ 0 ura3 $\Delta$ 0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP                                  |

Pos 19 KWY3403 ybr288cΔ::LacO256::LEU2  
 MATa can1Δ::pSTE2-spHIS5 lyp1Δ his3Δ1 leu2Δ0 ura3Δ0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP  
 ybr300cΔ::LacO256::LEU2  
 KWY2825 Y7092 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP

**Strains other chromosome loci**

KWY2823 Y7092 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP YBR022W::LacO256::LEU2  
 KWY2824 Y7092 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP INO1::LacO256::URA3  
 KWY2875 Y7092 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP RPL25::LacO256::LEU2  
 KWY2872 Y7092 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP RPL9A::LacO256::LEU2  
 KWY2873 Y7092 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP HXK1::LacO256::LEU2  
 KWY2884 Y7092 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ADH4::LacO256::LEU2  
 KWY2960 Y7092 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP PES4::LacO256::LEU2  
 KWY2961 Y7092 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP FIG2::LacO256::LEU2

**Strains for compaction measurements**

KWY3998 Y7092 Ndc1-tdTomato::NatR::RPL25NLS-CFP::GFP-LacI LEU2::TetR-3xmCherry(pKW3010)  
 Pos 8 KWY4511 MATa can1Δ::pSTE2-spHIS5 lyp1Δ his3Δ1 leu2Δ0 ura3Δ0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP  
 ybr022wΔ::LacO256::LEU2 ybr022wΔ::TetO128::URA3(pKW2837)  
 Pos 14 KWY4512 MATa can1Δ::pSTE2-spHIS5 lyp1Δ his3Δ1 leu2Δ0 ura3Δ0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP  
 ybr172cΔ::LacO256::LEU2 YBR022W::TetO128::URA3(pKW2837)  
 Pos 9 KWY4516 MATa can1Δ::pSTE2-spHIS5 lyp1Δ his3Δ1 leu2Δ0 ura3Δ0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP  
 ybr046cΔ::LacO256::LEU2 YBR022W::TetO128::URA3(pKW2837)  
 Pos 10 KWY4518 MATa can1Δ::pSTE2-spHIS5 lyp1Δ his3Δ1 leu2Δ0 ura3Δ0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP  
 ybr071wΔ::LacO256::LEU2 YBR022W::TetO128::URA3(pKW2837)  
 Pos 14 KWY4522 MATa can1Δ::pSTE2-spHIS5 lyp1Δ his3Δ1 leu2Δ0 ura3Δ0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP  
 ybr172cΔ::LacO256::LEU2 SEC66::TetO128::URA3(pKW3147)  
 Pos 15 KWY4523 MATa can1Δ::pSTE2-spHIS5 lyp1Δ his3Δ1 leu2Δ0 ura3Δ0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP  
 ybr203wΔ::LacO256::LEU2 SEC66::TetO128::URA3(pKW3147)  
 Pos 16 KWY4524 MATa can1Δ::pSTE2-spHIS5 lyp1Δ his3Δ1 leu2Δ0 ura3Δ0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP  
 ybr230cΔ::LacO256::LEU2 SEC66::TetO128::URA3(pKW3147)  
 Pos 8 KWY4514 MATa/α KWY4511 x KWY3998  
 Pos 14 KWY4515 MATa/α KWY4512 x KWY3998  
 Pos 9 KWY4519 MATa/α KWY4516 x KWY3998  
 Pos 10 KWY4520 MATa/α KWY4518 x KWY3998  
 Pos 14 KWY4527 MATa/α KWY4522 X KWY3998  
 Pos 15 KWY4528 MATa/α KWY4523 x KWY3998  
 Pos 16 KWY4529 MATa/α KWY4524 x KWY3998

**GAL delete strains**

KWY3665 MATa can1Δ::pSTE2-spHIS5 lyp1Δ his3Δ1 leu2Δ0 ura3Δ0 met15Δ0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP

|        |         |  |
|--------|---------|--|
|        |         | gal7-10-1Δ::KanMx  |
| Pos 3  | KWY4014 | MATa can1Δ::pSTE2-spHIS5 lyp1Δ his3Δ1 leu2Δ0 ura3Δ0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ybl044wΔ::LacO256::LEU2 gal7-10-1Δ::KanMx |
| Pos 5  | KWY4001 | MATa can1Δ::pSTE2-spHIS5 lyp1Δ his3Δ1 leu2Δ0 ura3Δ0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ybl012cΔ::LacO256::LEU2 gal7-10-1Δ::KanMx |
| Pos 7  | KWY4055 | MATa can1Δ::pSTE2-spHIS5 lyp1Δ his3Δ1 leu2Δ0 ura3Δ0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ybr016wΔ::LacO256::LEU2 gal7-10-1Δ::KanMx |
| Pos 8  | KWY4054 | MATa can1Δ::pSTE2-spHIS5 lyp1Δ his3Δ1 leu2Δ0 ura3Δ0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ybr022wΔ::LacO256::LEU2 gal7-10-1Δ::KanMx |
| Pos 9  | KWY4098 | MATa can1Δ::pSTE2-spHIS5 lyp1Δ his3Δ1 leu2Δ0 ura3Δ0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ybr046cΔ::LacO256::LEU2 gal7-10-1Δ::KanMx |
| Pos 10 | KWY3821 | MATa can1Δ::pSTE2-spHIS5 lyp1Δ his3Δ1 leu2Δ0 ura3Δ0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ybr071wΔ::LacO256::LEU2 gal7-10-1Δ::KanMx |
| Pos 14 | KWY4015 | MATa can1Δ::pSTE2-spHIS5 lyp1Δ his3Δ1 leu2Δ0 ura3Δ0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ybr172cΔ::LacO256::LEU2 gal7-10-1Δ::KanMx |
| Pos 3  | KWY4020 | MATa/α KWY4014xKWY2825   |
| Pos 5  | KWY4012 | MATa/α KWY4001xKWY2825   |
| Pos 7  | KWY4061 | MATa/α KWY4055xKWY2825   |
| Pos 8  | KWY4060 | MATa/α KWY4054xKWY2825   |
| Pos 9  | KWY4100 | MATa/α KWY4098xKWY2825   |
| Pos 10 | KWY3962 | MATa/α KWY3821xKWY2825   |
| Pos 14 | KWY4021 | MATa/α KWY4015xKWY2825   |
| Pos 3  | KWY4047 | MATa/α KWY3356xKWY3665   |
| Pos 5  | KWY4013 | MATa/α KWY3358xKWY3665   |
| Pos 7  | KWY4059 | MATa/α KWY3361xKWY3665   |
| Pos 8  | KWY4058 | MATa/α KWY3362xKWY3665   |
| Pos 9  | KWY4101 | MATa/α KWY3363xKWY3665   |
| Pos 10 | KWY4048 | MATa/α KWY3364xKWY3665   |
| Pos 14 | KWY4046 | MATa/α KWY3366xKWY3665   |

### Artificial tether strains

|       |         |  |
|-------|---------|--|
|       | KWY5251 | MATα can1Δ::pSTE2-spHIS5 lyp1Δ his3Δ1 leu2Δ0 ura3Δ0 met15Δ0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP MLP1::MLP1-TetR::KanMx  |
| Pos 3 | KWY5777 | MAT? NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ybl044wΔ::LacO256::LEU2 YBR022W::TetO128::URA3(pKW2837) MLP1::MLP1-TetR::KanMx |
| Pos 5 | KWY5748 | MAT? NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ybl012cΔ::LacO256::LEU2 YBR022W::TetO128::URA3(pKW2837) MLP1::MLP1-TetR::KanMx |
| Pos 7 | KWY5750 | MAT? NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ybr016wΔ::LacO256::LEU2 YBR022W::TetO128::URA3(pKW2837) MLP1::MLP1-TetR::KanMx |

|        |         |   |
|--------|---------|---|
| Pos 8  | KWY5548 | MAT? NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ybr022wΔ::LacO256::LEU2 ybr022wΔ::TetO128::URA3(pKW2837) MLP1::MLP1-TetR::KanMx |
| Pos 9  | KWY5753 | MAT? NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ybr046cΔ::LacO256::LEU2 YBR022W::TetO128::URA3(pKW2837) MLP1::MLP1-TetR::KanMx  |
| Pos 10 | KWY5780 | MAT? NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ybr071wΔ::LacO256::LEU2 YBR022W::TetO128::URA3(pKW2837) MLP1::MLP1-TetR::KanMx  |
| Pos 14 | KWY5783 | MAT? NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ybr172cΔ::LacO256::LEU2 YBR022W::TetO128::URA3(pKW2837) MLP1::MLP1-TetR::KanMx  |

### Mutants screen hit confirmation

|         |  |
|---------|--|
| KWY3610 | Y7092 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP YBR022W::LacO256::LEU2 hda1Δ::KanMX |
| KWY3611 | Y7092 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP YBR022W::LacO256::LEU2 rpd3Δ::KanMX |
| KWY3612 | Y7092 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP YBR022W::LacO256::LEU2 rco1Δ::KanMX |
| KWY3613 | Y7092 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP YBR022W::LacO256::LEU2 sds3Δ::KanMX |

### Mutant precursor strains

|         |  |
|---------|--|
| KWY3965 | MATα can1Δ::pSTE2-spHIS5 lyp1Δ his3Δ1 leu2Δ0 ura3Δ0 met15Δ0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ada2Δ::KanMx  |
| KWY4140 | MATα can1Δ::pSTE2-spHIS5 lyp1Δ his3Δ1 leu2Δ0 ura3Δ0 met15Δ0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP gcn5Δ::KanMx  |
| KWY4092 | MATα can1Δ::pSTE2-spHIS5 lyp1Δ his3Δ1 leu2Δ0 ura3Δ0 met15Δ0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP sgf73Δ::KanMx |
| KWY4137 | MATα can1Δ::pSTE2-spHIS5 lyp1Δ his3Δ1 leu2Δ0 ura3Δ0 met15Δ0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ubp8Δ::KanMx  |
| KWY4135 | MATα can1Δ::pSTE2-spHIS5 lyp1Δ his3Δ1 leu2Δ0 ura3Δ0 met15Δ0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP nup60Δ::KanMx |

### Mutant chromosome II strains

|          |                 |  |
|----------|-----------------|--|
| Pos 1–19 | KWY3971-KWY3988 | MAT? can1Δ::pSTE2-spHIS5 lyp1Δ his3Δ1 leu2Δ0 ura3Δ0 met15Δ0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ada2Δ::KanMx ybXΔ::LacO256::LEU2  |
| Pos 1–19 | KWY4311-KWY4330 | MAT? can1Δ::pSTE2-spHIS5 lyp1Δ his3Δ1 leu2Δ0 ura3Δ0 met15Δ0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP gcn5Δ::KanMx ybXΔ::LacO256::LEU2  |
| Pos 1–19 | KWY4141-KWY4160 | MAT? can1Δ::pSTE2-spHIS5 lyp1Δ his3Δ1 leu2Δ0 ura3Δ0 met15Δ0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP sgf73Δ::KanMx ybXΔ::LacO256::LEU2 |
| Pos 1–19 | KWY4291-KWY4310 | MAT? can1Δ::pSTE2-spHIS5 lyp1Δ his3Δ1 leu2Δ0 ura3Δ0 met15Δ0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP ubp8Δ::KanMx ybXΔ::LacO256::LEU2  |
| Pos 1–19 | KWY4271-KWY4290 | MAT? can1Δ::pSTE2-spHIS5 lyp1Δ his3Δ1 leu2Δ0 ura3Δ0 met15Δ0 NDC1::NDC1-tomato::NatMx6::CFP-NLS::LacI-GFP nup60Δ::KanMx ybXΔ::LacO256::LEU2 |

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