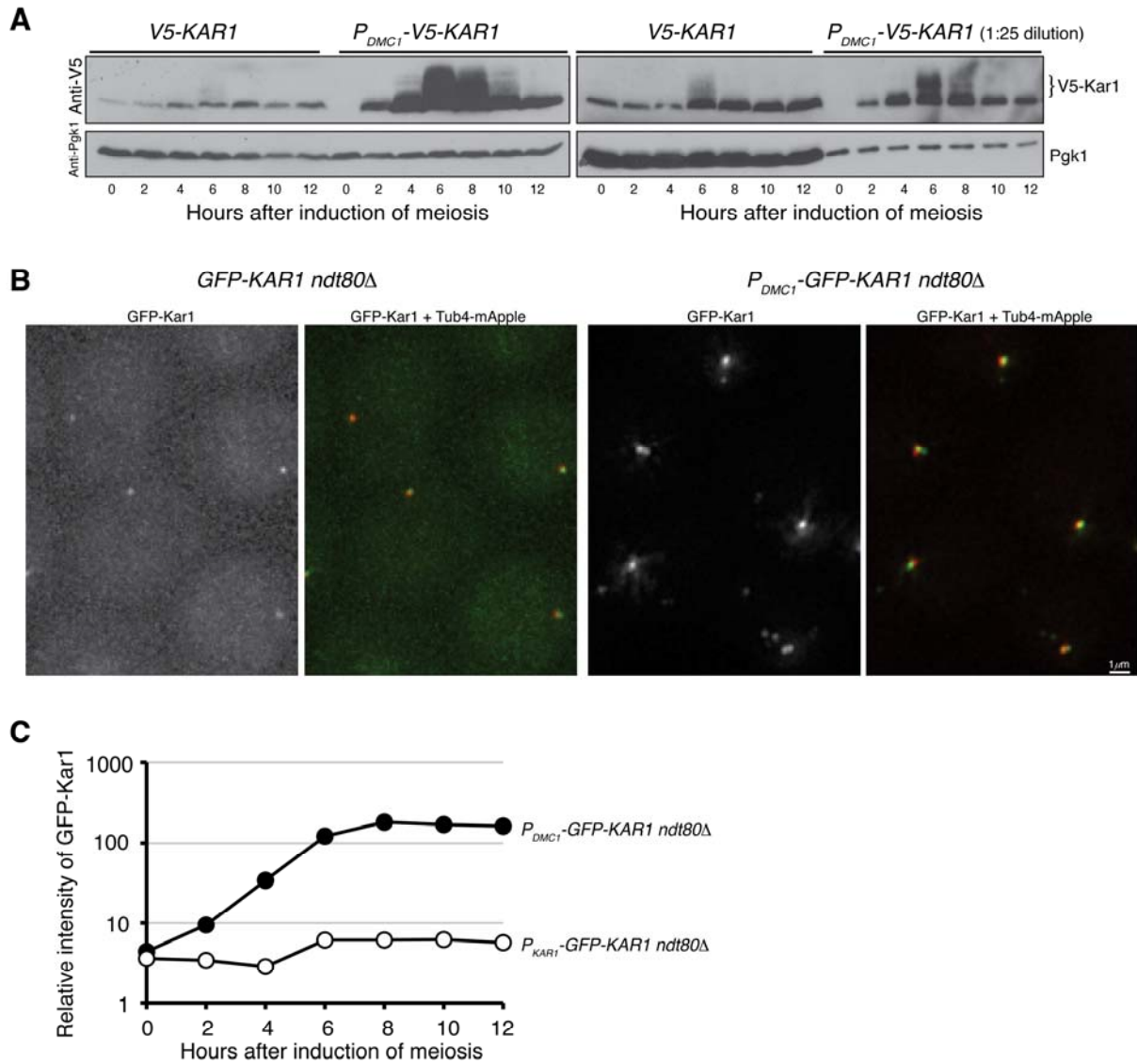


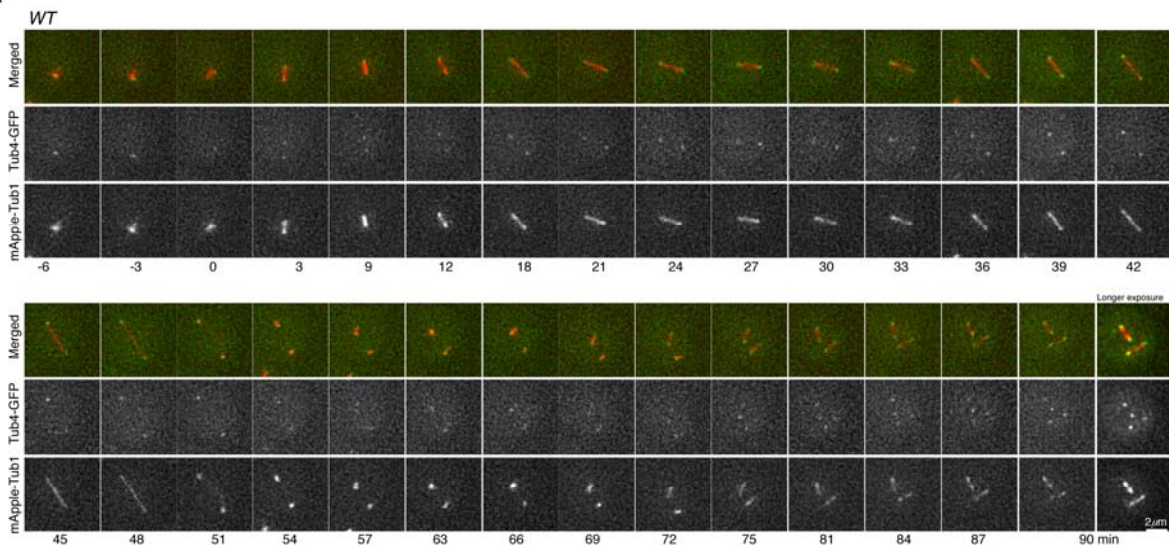
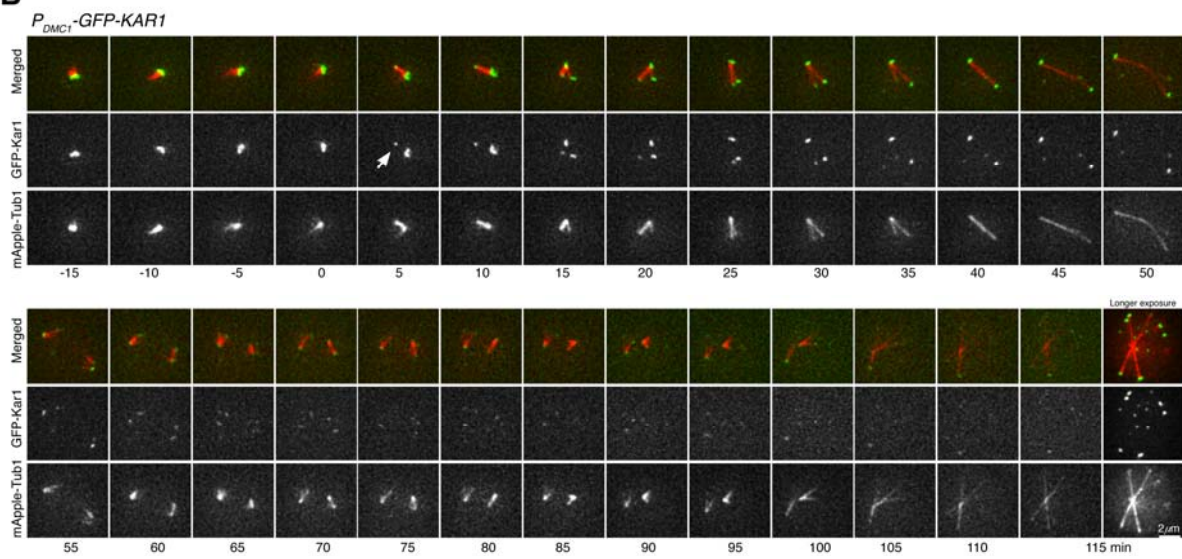
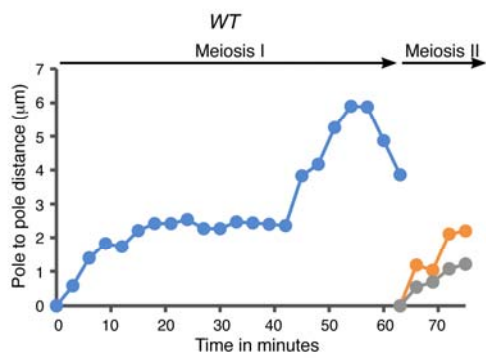
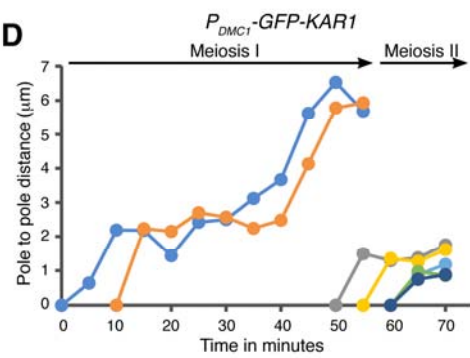
# Supplemental Materials

*Molecular Biology of the Cell*

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**Supplemental Figure 1.** Quantification of Kar1 overproduction during yeast meiosis. **(A)** Longer exposures of western blots of  $P_{KARI}$ -V5-KAR1 and  $P_{DMC1}$ -V5-KAR1 as shown in Fig 1A. Note that Kar1 appears to be modified post-translationally in meiosis (t=6). **(B)** Representative images showing GFP-Kar1 localization in prophase I cells arrested by  $ndt80\Delta$ . Tub4-mApple marks the SPB. **(C)** Quantification of GFP-Kar1 fluorescence intensity from cells shown in **B**. Yeast cells were induced to undergo synchronous meiosis, and aliquots were withdrawn at indicated time points. Live-cell fluorescence microscopy was performed to determine GFP-Kar1 intensity.

**A****B****C****D**

**Supplemental Figure 2.** Microtubule dynamics in Kar1-overproduced cells during yeast meiosis. Yeast cells were induced to undergo synchronous meiosis, and live-cell fluorescence microscopy was performed to determine Tub1-mApple dynamics in cells as shown in Fig 3A. (A) Wild type (*WT*). (B) *P<sub>DMCI</sub>-GFP-KAR1*. (C) Quantification of pole-to-pole distance in the cell shown in A. Time zero refers to the point of SPB separation in meiosis I. (D) Quantification of pole-to-pole distance in the cell shown in B. Note that the third SPB emerged 10 minutes after the first round of SPB separation.

**Table S1.** Yeast strains used in this study

Strain	Mating type	Genotype	Experiment
RKY1145	Mata	<i>his4-x, ura3, lys2, ho::LYS2, leu2::hisG</i>	Parental strain
S2683	Mata $\alpha$	<i>leu2-k, arg4-Nsp, ura3, lys2, ho::LYS2</i>	Parental strain
HY5705	Mata/ $\alpha$	<i>his3<math>\Delta</math>200, leu2-k, ura3, lys2, ho::LYS2, P<sub>KAR1</sub>-V5-KAR1::LEU2/ his3<math>\Delta</math>200, leu2-k, ura3, lys2, ho::LYS2, P<sub>KAR1</sub>-V5-KAR1::LEU2</i>	Figures 1A, S1A
HY5704	Mata/ $\alpha$	<i>his3<math>\Delta</math>200, leu2-k, ura3, lys2, ho::LYS2, P<sub>DMCI</sub>-V5-KAR1::LEU2/ his3<math>\Delta</math>200, leu2-k, ura3, lys2, ho::LYS2, P<sub>DMCI</sub>-V5-KAR1::LEU2</i>	Figures 1A, S1A
HY5044	Mata/ $\alpha$	<i>his3<math>\Delta</math>200, leu2-k, ura3, lys2, ho::LYS2, TUB4-mApple::HIS5, GFP-KAR1/his3<math>\Delta</math>200, leu2-k, ura3, lys2, ho::LYS2, TUB4- mApple::HIS5, GFP-KAR1</i>	Figures 1B, 1C, 2A
HY4915	Mata/ $\alpha$	<i>his3<math>\Delta</math>200, leu2-k, ura3, lys2, ho::LYS2, TUB4-mAppleE::HIS5, P<sub>DMCI</sub>-GFP-KAR1::LEU2/his3<math>\Delta</math>200, leu2-k, ura3, lys2, ho::LYS2, TUB4-mApple::HIS5, P<sub>DMCI</sub>-GFP-KAR1::LEU2</i>	Figures 1B, 1C, 1D
HY1635	Mata/ $\alpha$	<i>his3<math>\Delta</math>200, leu2-k, ura3, lys2, ho::LYS2, TUB4-mApple::HIS5/ his3<math>\Delta</math>200, leu2-k, ura3, lys2, ho::LYS2, TUB4-mApple::HIS5</i>	Figure 1D
HY5483	Mata/ $\alpha$	<i>leu2, ura3, SPC42-mApple::HIS5, P<sub>DMCI</sub>-GFP-KAR1::LEU2/ leu2, ura3, SPC42-mApple::HIS5, P<sub>DMCI</sub>-GFP-KAR1::LEU2</i>	Figure 2B

HY2163	Mata/ $\alpha$	<i>his3<math>\Delta</math>200, leu2-k, ura3, lys2, ho::LYS2, TUB1-mApple::HIS5/his3<math>\Delta</math>200, leu2-k, ura3, lys2, ho::LYS2, TUB4-GFP::HIS5</i>	Figures 3A, S2A, S2C
HY5680	Mata/ $\alpha$	<i>his3<math>\Delta</math>200, leu2-k, ura3, lys2, ho::LYS2, P<sub>DMCI</sub>-GFP-KAR1::LEU2/his3<math>\Delta</math>200, leu2-k, ura3, lys2, ho::LYS2, TUB1-mApple::HIS5, P<sub>DMCI</sub>-GFP-KAR1::LEU2</i>	Figures 3A, S2B, S2D
HY3950	Mata/ $\alpha$	<i>leu2, ura3, HTA1-mApple::HIS5, TUB4-GFP::HIS5/ leu2, ura3, HTA1-mApple::HIS5, TUB4-GFP::HIS5</i>	Figures 3B, 3C, 3D, 3E, 4A, 4B
HY5603	Mata/ $\alpha$	<i>his3<math>\Delta</math>200, leu2-k, ura3, lys2, ho::LYS2, HTA1-mApple::HIS5, P<sub>DMCI</sub>-GFP-KAR1::LEU2/his3<math>\Delta</math>200, leu2-k, ura3, lys2, ho::LYS2, HTA1-mApple::HIS5, P<sub>DMCI</sub>-GFP-KAR1::LEU2</i>	Figures 3B, 3C, 3D, 3E, 4A, 4C
HY5759	Mata/ $\alpha$	<i>his3<math>\Delta</math>200, leu2-k, ura3, lys2, ho::LYS2, TUB4-mApple::HIS5, P<sub>DMCI</sub>-GFP-kar1<math>\Delta</math>TMD ::LEU2/his3<math>\Delta</math>200, leu2-k, ura3, lys2, ho::LYS2, TUB4-mApple::HIS5, P<sub>DMCI</sub>-GFP-kar1<math>\Delta</math>TMD ::LEU2</i>	Figures 5B, 5C
HY5766	Mata/ $\alpha$	<i>leu2, ura3, ndt80<math>\Delta</math>::HB, TUB4-mApple, P<sub>DMCI</sub>-GFP-kar1<math>\Delta</math>TMD ::LEU2/ leu2, ura3, ndt80<math>\Delta</math>::HB, TUB4-mApple, P<sub>DMCI</sub>-GFP-kar1<math>\Delta</math>TMD ::LEU2</i>	Figure 5D
HY5840	Mata/ $\alpha$	<i>his3<math>\Delta</math>200, leu2-k, ura3, lys2, ho::LYS2, TUB4-mApple::HIS5, P<sub>DMCI</sub>-GFP-kar1<math>\Delta</math>15 ::LEU2/his3<math>\Delta</math>200, leu2-k, ura3, lys2, ho::LYS2, TUB4-mApple::HIS5, P<sub>DMCI</sub>-GFP-kar1<math>\Delta</math>15::LEU2</i>	Figure 5E
HY5593	Mata/ $\alpha$	<i>leu2, ura3, ndt80<math>\Delta</math>::HB, TUB4-mApple, P<sub>DMCI</sub>-GFP-kar1<math>\Delta</math>15 ::LEU2/ leu2, ura3, ndt80<math>\Delta</math>::HB, TUB4-mApple, P<sub>DMCI</sub>-GFP-kar1<math>\Delta</math>15 ::LEU2</i>	Figure 5F
HY6077	Mata/ $\alpha$	<i>his3<math>\Delta</math>200, leu2-k, ura3, lys2, ho::LYS2, TUB4-mApple::HIS5, P<sub>DMCI</sub>-GFP-kar1<math>\Delta</math>18::LEU2/his3<math>\Delta</math>200, leu2-k, ura3, lys2, ho::LYS2, TUB4-mApple::HIS5, P<sub>DMCI</sub>-GFP-kar1<math>\Delta</math>18::LEU2</i>	Figure 5G
HY6078	Mata/ $\alpha$	<i>leu2, ura3, ndt80<math>\Delta</math>::HB, TUB4-mApple, P<sub>DMCI</sub>-GFP-kar1<math>\Delta</math>18 ::LEU2/ leu2, ura3, ndt80<math>\Delta</math>::HB, TUB4-mApple, P<sub>DMCI</sub>-GFP-kar1<math>\Delta</math>18::LEU2</i>	Figure 5H

HY4971	Mata/ $\alpha$	<i>leu2, ura3, ndt80<math>\Delta</math>::HB, TUB4-mApple::HIS5, P<sub>DMCI</sub>-GFP-KARI::LEU2/ leu2, ura3, ndt80<math>\Delta</math>::HB, TUB4-mApple::HIS5, P<sub>DMCI</sub>-GFP-KARI::LEU2</i>	Figures 6A, 6B, S1B, S1C
HY5091	Mata/ $\alpha$	<i>leu2, TUB4-mApple::HIS5, ndt80<math>\Delta</math>::KAN, ura3::P<sub>GPD1</sub>-GAL4.ER::URA3, GFP-KARI/ leu2, TUB4-mApple::HIS5, ndt80<math>\Delta</math>::KAN, ura3::P<sub>GPD1</sub>-GAL4.ER::URA3, GFP-KARI</i>	Figures 6B, S1B, S1C
HY4361	Mata/ $\alpha$	<i>ura3, leu2, his4, P<sub>CLB2</sub>-IPL1::KANMX4, TUB4-mApple, ndt80<math>\Delta</math>::HB/ ura3, leu2, his4, P<sub>CLB2</sub>-IPL1::KANMX4, TUB4-mApple, ndt80<math>\Delta</math>::HB</i>	Figure 6C
HY5499	Mata/ $\alpha$	<i>ura3, leu2, his4, P<sub>CLB2</sub>-IPL1::KANMX4, TUB4-mApple, ndt80<math>\Delta</math>::HB, P<sub>DMCI</sub>-GFP-KARI::LEU2/ ura3, leu2, his4, P<sub>CLB2</sub>-IPL1::KANMX4, TUB4-mApple, ndt80<math>\Delta</math>::HB, P<sub>DMCI</sub>-GFP-KARI::LEU2</i>	Figure 6C
HY5864	Mata/ $\alpha$	<i>arg4, leu2, TUB4-mApple::HIS5, ura3::P<sub>GPD1</sub>-GAL4.ER::URA3, P<sub>GAL</sub>-NDT80::TRP1, P<sub>DMCI</sub>-GFP-KARI::LEU2/ arg4, leu2, TUB4-mApple::HIS5, ura3::P<sub>GPD1</sub>-GAL4.ER::URA3, P<sub>GAL</sub>-NDT80::TRP1, P<sub>DMCI</sub>-GFP-KARI::LEU2</i>	Figure 6D
HY5863	Mata/ $\alpha$	<i>arg4, leu2, TUB4-mApple::HIS5, ura3::P<sub>GPD1</sub>-GAL4.ER::URA3, P<sub>GAL</sub>-NDT80::TRP1, P<sub>GALI</sub>-GFP-KARI::LEU2/ arg4, leu2, TUB4-mApple::HIS5, ura3::P<sub>GPD1</sub>-GAL4.ER::URA3, P<sub>GAL</sub>-NDT80::TRP1, P<sub>GALI</sub>-GFP-KARI::LEU2</i>	Figure 6E
HY5871	Mata/ $\alpha$	<i>ho::LYS2, ura3, leu2::hisG, his3::hisG, P<sub>CLB2</sub>-CDC20::KANMX6, his3<math>\Delta</math>200, leu2-k, ura3, lys2, TUB4-mApple::HIS5, P<sub>DMCI</sub>-GFP-KARI::HIS5/ ho::LYS2, ura3, leu2::hisG, his3::hisG, P<sub>CLB2</sub>-CDC20::KANMX6, his3<math>\Delta</math>200, leu2-k, ura3, lys2, TUB4-mApple::HIS5, P<sub>DMCI</sub>-GFP-KARI::HIS5</i>	Figures 7A, 7B
HY5869	Mata/ $\alpha$	<i>ho::LYS2, ura3, leu2::hisG, his3::hisG, P<sub>CLB2</sub>-CDC20::KANMX6, his3<math>\Delta</math>200, leu2-k, ura3, lys2, TUB4-mApple::HIS5/ ho::LYS2, ura3, leu2::hisG, his3::hisG, P<sub>CLB2</sub>-CDC20::KANMX6, his3<math>\Delta</math>200, leu2-k, ura3, lys2, TUB4-mApple::HIS5</i>	Figure 7B

HY5952	Mata/ $\alpha$	<i>leu2, ura3, SFII-GFP::HIS5, TUB4-mApple, PCLB2-CDC20::KANMX6, P<sub>DMC1</sub>-V5-KAR1::LEU2/ leu2, ura3, SFII-GFP::HIS5, TUB4-mApple, PCLB2-CDC20::KANMX6</i>	Figure 7C
HY5929	Mata/ $\alpha$	<i>ho::LYS2, ura3, leu2::hisG, his3::hisG, P<sub>CLB2</sub>-CDC20::KANMX6, his3<math>\Delta</math>200, leu2-k, ura3, lys2, MPS3-mApple::HIS5, P<sub>DMC1</sub>-GFP-KAR1::HIS5/ ho::LYS2, ura3, leu2::hisG, his3::hisG, P<sub>CLB2</sub>-CDC20::KANMX6, his3<math>\Delta</math>200, leu2-k, ura3, lys2, MPS3-mApple::HIS5, P<sub>DMC1</sub>-GFP-KAR1::HIS5</i>	Figure 7D
HY6020	Mata/ $\alpha$	<i>leu2, ura3, P<sub>CLB2</sub>-CDC20::KANMX6, TUB1-mApple::HIS5, P<sub>DMC1</sub>-GFP-KAR1::HIS5/ leu2, ura3, PCLB2-CDC20::KANMX6</i>	Figure 7E
HY3204	Mata/ $\alpha$	<i>ura3, leu2, P<sub>CLB2</sub>-CDC5::KAN, TUB4-mApple::HIS5/ ura3, leu2, P<sub>CLB2</sub>-CDC5::KAN, TUB4-mApple::HIS5</i>	Figure 7F
HY5760	Mata/ $\alpha$	<i>ura3, leu2, P<sub>CLB2</sub>-CDC5::KAN, TUB4-mApple::HIS5, P<sub>DMC1</sub>-GFP-KAR1::LEU2/ ura3, leu2, P<sub>CLB2</sub>-CDC5::KAN, TUB4-mApple::HIS5, P<sub>DMC1</sub>-GFP-KAR1::LEU2</i>	Figure 7G
HY3654	Mata/ $\alpha$	<i>his4-x, ura3, lys2, ho::LYS2, leu2::hisG, P<sub>CLB2</sub>-SFII::KAN, TUB4-mApple::HB/leu2-k, arg4-Nsp, ura3, lys2, ho::LYS2, P<sub>CLB2</sub>-SFII::KAN, TUB4-mApple::HB</i>	Figure 8A
HY5773	Mata/ $\alpha$	<i>his4-x, ura3, leu2, hisG, P<sub>CLB2</sub>-SFII::KANMX, TUB4-mApple::HB, P<sub>DMC1</sub>-SFII::URA3/leu2-k, arg4-Nsp, ura3, P<sub>CLB2</sub>-SFII::KANMX, TUB4-mApple::HB, P<sub>DMC1</sub>-SFII::URA3</i>	Figure 8B
HY5652	Mata/ $\alpha$	<i>his4-x, ura3, lys2, ho::LYS2, leu2::hisG, P<sub>CLB2</sub>-SFII::KAN, TUB4-mApple::HB, P<sub>DMC1</sub>-GFP-KAR1::LEU2/leu2-k, arg4-Nsp, ura3, lys2, ho::LYS2, P<sub>CLB2</sub>-SFII::KAN, TUB4-mApple::HB, P<sub>DMC1</sub>-GFP-KAR1::LEU2</i>	Figure 8C
HY5719	Mata/ $\alpha$	<i>his4-x, ura3, lys2, ho::LYS2, leu2::hisG, P<sub>CLB2</sub>-SFII::KAN, TUB4-mApple::HB, P<sub>DMC1</sub>-sfi1-6D::URA3/leu2-k, arg4-Nsp, ura3, lys2, ho::LYS2, P<sub>CLB2</sub>-SFII::KAN, TUB4-mApple::HB, P<sub>DMC1</sub>-sfi1-6D::URA3</i>	Figure 8D

HY5718	Mata/ $\alpha$	<i>his4-x, ura3, lys2, ho::LYS2, leu2::hisG, P<sub>CLB2</sub>-SFII::KAN, TUB4-mApple::HB, P<sub>DMC1</sub>-sfi1-6A::URA3/leu2-k, arg4-Nsp, ura3, lys2, ho::LYS2, P<sub>CLB2</sub>-SFII::KAN, TUB4-mAppleE::HB, P<sub>DMC1</sub>-sfi1-6A::URA3</i>	Figure 8E
HY5702	Mata/ $\alpha$	<i>his4-x, ura3, lys2, ho::LYS2, leu2::hisG, P<sub>CLB2</sub>-SFII::KAN, TUB4-mApple::HB, P<sub>DMC1</sub>-sfi1-6D::URA3, P<sub>DMC1</sub>-GFP-KARI::LEU2/leu2-k, arg4-Nsp, ura3, lys2, ho::LYS2, P<sub>CLB2</sub>-SFII::KAN, TUB4-mApple::HB, P<sub>DMC1</sub>-sfi1-6D::URA3, P<sub>DMC1</sub>-GFP-KARI::LEU2</i>	Figure 8F
HY5720	Mata/ $\alpha$	<i>his4-x, ura3, lys2, ho::LYS2, leu2::hisG, P<sub>CLB2</sub>-SFII::KAN, TUB4-mApple::HB, P<sub>DMC1</sub>-sfi1-6A::URA3, P<sub>DMC1</sub>-GFP-KARI::LEU2/leu2-k, arg4-Nsp, ura3, lys2, ho::LYS2, P<sub>CLB2</sub>-SFII::KAN, TUB4-mApple::HB, P<sub>DMC1</sub>-sfi1-6A::URA3, P<sub>DMC1</sub>-GFP-KARI::LEU2</i>	Figure 8G
HY2074	Mata/ $\alpha$	<i>leu2, ura3, TUB4-mApple::HIS5, P<sub>CLB2</sub>-CDC14::KAN/leu2, ura3, TUB4-mApple::HIS5, P<sub>CLB2</sub>-CDC14::KAN</i>	Figure 8H
HY5772	Mata/ $\alpha$	<i>leu2, ura3, TUB4-mApple::HIS5, P<sub>CLB2</sub>-CDC14::KAN, P<sub>DMC1</sub>-GFP-KARI::LEU2/leu2, ura3, TUB4-mApple::HIS5, P<sub>CLB2</sub>-CDC14::KAN, P<sub>DMC1</sub>-GFP-KARI::LEU2</i>	Figure 8I

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**Table S2.** Plasmids used in this study.

<b>Plasmid name</b>	<b>Description</b>
pHG254	<i>P<sub>DMCI</sub>-SFII, URA3</i>
pHG433	<i>P<sub>DMCI</sub>-GFP-KARI, LEU2</i>
pHG434	<i>P<sub>DMCI</sub>-SFII-6A, URA3</i>
pHG435	<i>P<sub>DMCI</sub>-SFII-6D, URA3</i>
pHG465	<i>P<sub>KARI</sub>-GFP-KARI, URA3</i>
pHG331	<i>P<sub>GALI</sub>-GFP-KARI, LEU2</i>
pHG524	<i>P<sub>DMCI</sub>-GFP-KARI-<math>\Delta</math>15, LEU2</i>
pHG614	<i>P<sub>DMCI</sub>-GFP-KARI-<math>\Delta</math>18, LEU2</i>
pHG549	<i>P<sub>DMCI</sub>-GFP-KARI-<math>\Delta</math>TMD, LEU2</i>
pHG535	<i>P<sub>DMCI</sub>-V5-KARI, LEU2</i>
pHG536	<i>P<sub>KARI</sub>-V5-KARI, LEU2</i>