Supplementary Table 1. Yeast strains used in this study

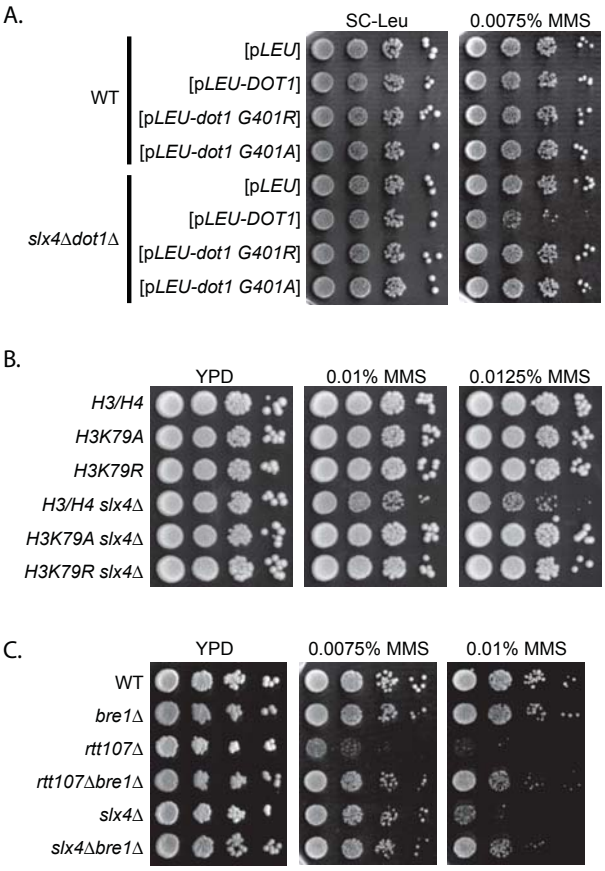
Strain	Relevant Genotype	Source*
MKY5	*MATα ade2-1 can1-100 his3-11 leu2-3,112 trp1-1 ura3-1 LYS2*	
MKY6	*MATA ADE2 can1-100 his3-11 leu2-3,112 trp1-1 ura3-1 lys2Δ*	
MKY7	*MATA ade2-1 can1-100 his3-11 leu2-3,112 trp1-1 ura3-1 LYS2*	
MKY399	*MATα ADE2 can1-100 his3-11 leu2-3,112 trp1-1 ura3-1 lys2Δ*	
MKY10	*MATα his4*	
MKY11	*MATA his4*	
MKY921	MKY5, *dot1Δ::his5MX6*	
MKY922	MKY5, *rtt107Δ::KANMX6 lys2Δ*	
MKY923	MKY7, *rtt107Δ::KANMX6 dot1Δ::his5MX6*	
MKY924	MKY7, *slx4Δ::KANMX6*	
MKY925	MKY5, *slx4Δ::KANMX6 dot1Δ::his5MX6*	
MKY927	MKY5, *bre1Δ::HYGMX6 lys2Δ*	
MKY928	MKY5, *rtt107Δ::KANMX6*	
MKY929	MKY5, *rtt107Δ::KANMX6 bre1Δ::HYGMX6 lys2Δ*	
MKY930	MKY5, *slx4Δ::KANMX6 lys2Δ*	
MKY931	MKY5, *slx4Δ::KANMX6 bre1Δ::HYGMX6 lys2Δ*	
MKY932	MKY5, *[pRS315]*	
MKY933	MKY5, *[pRS315, DOT1]*	
MKY934	MKY5, *[pRS315, dot1G401R]*	
MKY935	MKY5, *[pRS315, dot1G401A]*	
MKY936	MKY7, *rtt107Δ::KANMX6 dot1Δ::his5MX6 [pRS315]*	
MKY937	MKY7, *rtt107Δ::KANMX6 dot1Δ::his5MX6 [pRS315, DOT1]*	
MKY938	MKY7, *rtt107Δ::KANMX6 dot1Δ::his5MX6 [pRS315, dot1G401R]*	
MKY939	MKY7, *rtt107Δ::KANMX6 dot1Δ::his5MX6 [pRS315, dot1G401A]*	
MKY940	*MATA/α ADE2/ade2-1 can1-100/can1-100 his3-11/his3-11 leu2-3,112/leu2-3,112 LYS2/lys2Δ*	
MKY941	MKY940, *rtt107Δ::KANMX6/rtt107Δ::NATMX6*	
MKY942	MKY940, *dot1Δ::his5MX6/dot1Δ::his5MX6*	
MKY943	MKY940, *rtt107Δ::KANMX6/rtt107Δ::KANMX6 dot1Δ::his5MX6/ dot1Δ::his5MX6*	
MKY944	MKY7, *Rad 52-GFP::NATMX6*	
MKY945	MKY7, *rtt107Δ::KANMX6 Rad 52-GFP::NATMX6*	
MKY946	MKY7, *dot1Δ::his5MX6 Rad 52-GFP::NATMX6*	
MKY947	MKY7, *rtt107Δ::KANMX6 dot1Δ::his5MX6 Rad 52-GFP::NATMX6*	
MKY949	MKY7, *dot1Δ::his5MX6*	
MKY950	MKY7, *rtt107Δ::KANMX6*	
MKY951	MKY399, *rtt107Δ::KANMX6*	
MKY952	MKY6, *dot1Δ::his5MX6*	
MKY953	MKY399, *rev1Δ::HYGMX6*	
MKY954	MKY6, *rtt107Δ::KANMX6 dot1Δ::his5MX6*	
MKY955	MKY399, *dot1Δ::his5MX6 rev1Δ::HYGMX6*	
MKY956	MKY399, *rtt107Δ::KANMX6 rev1Δ::HYGMX6*	
MKY957	MKY6, *rtt107Δ::KANMX6 dot1Δ::his5MX6 rev1Δ::HYGMX6*	
MKY958	MKY5, *rev3Δ::HYGMX6*	

MKY959	MKY5, *rtt107Δ::KANMX6 dot1Δ::his5MX6*	
MKY960	MKY5, *dot1Δ::his5MX6 rev3Δ::HYGMX6*	
MKY961	MKY5, *rtt107Δ::KANMX6 rev3Δ::HYGMX6*	
MKY962	MKY5, *rtt107Δ::KANMX6 dot1Δ:: his5MX6 rev3Δ::HYGMX6*	
MKY963	MKY399, *hht1Δ-hhf1Δ::LEU2 hht2Δ-hhf2Δ::his5MX6 [pRS316, HHT2-HHF2]*	(1)
MKY964	MKY6, *rtt107Δ::KANMX6 hht1Δ-hhf1Δ::LEU2 hht2Δ-hhf2Δ::his5MX6 [pRS316, HHT2-HHF2]*	
MKY965	MKY399, *hht1Δ-hhf1Δ::LEU2 hht2Δ-hhf2Δ::his5MX6 [pRS314, hht2K79A-HHF2]*	
MKY966	MKY6, *rtt107Δ::KANMX6 hht1Δ-hhf1Δ::LEU2 hht2Δ-hhf2Δ::his5MX6 [pRS314, hht2K79A-HHF2]*	
MKY992	MKY5, *SLX4-3XFLAG::NATMX6*	
MKY993	MKY5, *rtt107Δ::KANMX6 SLX4-3XFLAG::NATMX6*	
MKY994	MKY5, *dot1Δ::his5MX6 SLX4-3XFLAG::NATMX6*	
MKY995	MKY5, *rtt107Δ::KANMX6 dot1Δ::his5MX6 SLX4-3XFLAG::NATMX6*	
MKY996	MKY5, *RTT107-3XFLAG::NATMX6 lys2Δ*	
MKY997	MKY5, *slx4Δ::KANMX6 RTT107-3XFLAG::NATMX6*	
MKY998	MKY7, *dot1Δ::his5MX6 RTT107-3XFLAG::NATMX6 lys2Δ*	
MKY999	MKY7, *slx4Δ::KANMX6 dot1Δ::his5MX6 RTT107-3XFLAG::NATMX6 lys2Δ*	
MKY1000	MKY6, *hht1Δ-hhf1Δ::LEU2 hht2Δ-hhf2Δ::his5MX6 [pRS314, hht2K79R-HHF2]*	
MKY1001	MKY399, *rtt107Δ::KANMX6 hht1Δ-hhf1Δ::LEU2 hht2Δ-hhf2Δ::his5MX6 [pRS314, hht2K79R-HHF2]*	
MKY1040	*MATα his3Δ1 leu2Δ0 lys2Δ0 ura3Δ0*	
MKY1041	MKY1040, *rtt107Δ::his5MX6*	
MKY1042	MKY1040, *dot1Δ::HYGMX6*	
MKY1043	MKY1040, *rtt107Δ::his5MX6 dot1Δ::HYGMX6*	
MKY1055	MKY5, *rtt107Δ::KANMX6 [pRS315, RTT107]*	
MKY1056	MKY5, *rtt107Δ::KANMX6 [pRS315, rtt107-4AQ]*	
MKY1057	MKY5, *rtt107Δ::KANMX6 [pRS315]*	
MKY1058	MKY5, *rtt107Δ::KANMX6 dot1Δ: his5MX6 [pRS315, RTT107]*	
MKY1059	MKY5, *rtt107Δ::KANMX6 dot1Δ::his5MX6 [pRS315, rtt107-4AQ]*	
MKY1060	MKY5, *rtt107Δ::KANMX6 dot1Δ::his5MX6 [pRS315]*	
MKY1082	MKY5, *slx4Δ::KANMX6 dot1Δ::his5MX6 [pRS315]*	
MKY1083	MKY5, *slx4Δ::KANMX6 dot1Δ::his5MX6 [pRS315, DOT1]*	
MKY1084	MKY5, *slx4Δ::KANMX6 dot1Δ::his5MX6 [pRS315, dot1 G401A]*	
MKY1085	MKY5, *slx4Δ::KANMX6 dot1Δ::his5MX6 [pRS315, dot1 G401R]*	
MKY1086	MKY6, *slx4Δ::KANMX6 hht1Δ-hhf1Δ::LEU2 hht2Δ-hhf2Δ::his5MX6 [pRS314, HHT2-HHF2]*	
MKY1087	MKY6, *slx4Δ::KANMX6 hht1Δ-hhf1Δ::LEU2 hht2Δ-hhf2Δ::his5MX6 [pRS314, hht2K79A-HHF2]*	
MKY1088	MKY6, *slx4Δ::KANMX6 hht1Δ-hhf1Δ::LEU2 hht2Δ-hhf2Δ::his5MX6 [pRS314, hht2K79R-HHF2]*	
MKY1094	MKY6, *ars603.5Δ::URA3 ars608Δ::HIS3 ars609Δ::TRP1 LEU2::BrdU-Inc*	(2)
MKY1095	MKY6, *ars603.5Δ::URA3 ars608Δ::HIS3 ars609Δ::TRP1 LEU2::BrdU-Inc rtt107Δ::KANMX6*	
MKY1096	MKY6, *ars603.5Δ::URA3 ars608Δ::HIS3 ars609Δ::TRP1 LEU2::BrdU-Inc dot1Δ::HYGMX6*	
MKY1097	MKY6, *ars603.5Δ::URA3 ars608Δ::HIS3 ars609Δ::TRP1 LEU2::BrdU-Inc rtt107Δ::KANMX6 dot1Δ::HYGMX6*	

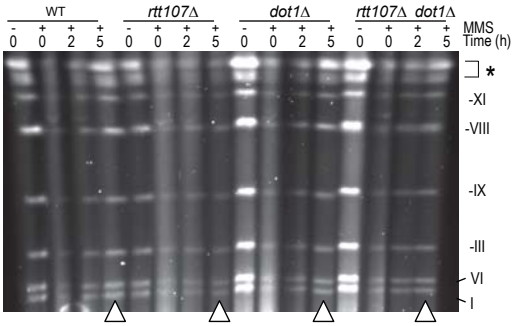
***** unless otherwise indicated, all strains were constructed for this work (details available upon request) or were from the laboratory collections. All strains are in the W303 background, except strains MKY1040-MKY1043, which are in the S288C background.

References

1. Yang, B., and Kirchmaier, A. L. (2006) *Mol. Biol. Cell* **17**, 5287-5297
2. Viggiani, C. J., and Aparicio, O. M. (2006) *Yeast* **23**, 1045-1051



Supplementary Figure 1. Abrogation of H3 K79 trimethylation suppressed the MMS sensitivity of strains lacking Slx4. Tenfold serial dilutions of the indicated strains were plated onto media containing 0.0075% , 0.01%, or 0.0125% MMS. (A) Loss of Dot1's catalytic activity, (B) H3 K79A, K79R, or (C) loss of Bre1 suppressed MMS sensitivity of *slx4*Δ mutants.



Supplementary Figure 2. Requirement of Rtt107 for resumption of replication after DNA damage was partially suppressed by deletion of *DOT1*. PFGE analysis indicated *rtt107*Δ*dot1*Δ mutants had more efficient DNA replication after DNA damage than *rtt107*Δ mutants.
* : unresolved chromosomes.

SUPPLEMENTARY METHODS

MMS Sensitivity Measurements – Overnight cultures grown in YPD or SC-Leu at 30°C were diluted to 0.3 $O.D_{600}$. The cells were tenfold serially diluted and spotted onto solid YPD plates or SC-Leu plates with MMS (Sigma) at various concentrations. The plates were then incubated at 30°C for 2-3 days.

Pulsed-Field Gel Electrophoresis – Briefly, cells were arrested in G1 by addition of 2 μg/ml of α-factor for 2 h at 30°C in YPD, then washed with sterile 1X PBS and resuspended in YPD containing 0.03% MMS for 1 h. MMS was removed by treating with 2% sodium thiosulfate and washing with sterile 1X PBS. The cells were resuspended in YPD and incubated at 30°C during the recovery phase. Aliquots were removed at the indicated times and processed further.

Cells were treated using the CHEF Yeast Genomic DNA Plug Kit (Bio-Rad, CA). As described by the manufacturer, cells were washed with cold 50 mM EDTA and resuspended in Cell Suspension Buffer containing 0.75% agarose and Lyticase, and incubated for 2 h at 37^{o}C. The agarose plugs were incubated with Proteinase K overnight at 50^{o}C, then washed and loaded onto a 1.0% agarose gel in 0.5X Tris-borate EDTA. Pulsed-field gel electrophoresis was carried out as described by the manufacturer (GE Healthcare, UK). Briefly, the gel was subjected to electrophoresis at 100 V with a switch time of 60–120 s for 24 h with constant recirculation of the buffer at 8.5°C. Following electrophoresis, the gels were stained with ethidium bromide (0.5 μg/ml) and photographed.