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Sir silencing

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Chromatin silencing depends on passage through the S-phase of the cell cycle and was widely believed to depend on DNA replication. In two papers in the January 26 *Science*, Kirchmaier and Rine and Li *et al.* challenge this dogma by reporting that the establishment of transcriptional silencing can occur in the absence of replication (*Science* 2001, **291**:646-650; *Science* 2001, **291**:650-653). Both groups used an ingenious genetic trick, involving site-specific recombination, to generate non-replicating DNA rings containing the silent *HMR* mating-type locus from budding yeast. Recruiting the silencing protein *Sir1* induced silencing at the synthetic silencer without any detectable DNA replication. Furthermore, the authors show that the artificial silent rings mimic features of authentic heterochromatin, including histone hypoacetylation and altered supercoiling. Strangely, despite being independent of replication, silencing still required passage through the S-phase of the cell cycle.

References

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2. *Science*, [<http://www.sciencemag.org>]
3. Cloning and characterization of four SIR genes of *Saccharomyces cerevisiae*.