



**Figure 11. rDNA Recombination Leads to Cellular Senescence in Yeast**

The rDNA is organized in an array of 140–200 direct repeats of a 9.1-kb unit (*red block*). These encode the 18S, 5.8S, 25S, and 5S rRNAs, and contain two Sir2-responsive elements downstream of the 5S gene and within the 18S gene. The rDNA repeats tend to be excised in aging yeast cells, and the circles accumulate in the mother cell (Kaeberlein et al. 1999). This correlates with premature senescence and can be antagonized by Sir2, which helps suppress unequal recombination and ring excision.