SAD-2 is required for meiotic silencing by unpaired DNA and perinuclear localization of SAD-1 RNA-directed RNA polymerase.

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Recommendations:

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INTERESTING HYPOTHESIS | NEW FINDING
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This is interesting because a potential new player in eukaryotic gene silencing has been found.
This gene, Neurospora crassa SAD-2, is necessary for meiotic silencing of unpaired DNA.
Its proposed role is to localize the RNA-directed RNA polymerase SAD-1 to the perinuclear region.

Disclosures
None declared
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Abstract:

A gene unpaired during the meiotic homolog pairing stage in Neurospora generates a sequence-specific signal that silences the expression of all copies of that gene. This process is called Meiotic Silencing by Unpaired DNA (MSUD). Previously, we have shown that SAD-1, an RNA-directed RNA polymerase (RdRP), is required for MSUD. We isolated a second gene involved in this process, sad-2. Mutated Sad-2 (RIP) alleles, like those of Sad-1, are dominant and suppress MSUD. Crosses homozygous for Sad-2 are blocked at meiotic prophase. SAD-2 colocalizes with SAD-1 in the perinuclear region, where small interfering RNAs have been shown to reside in mammalian cells. A functional sad-2(+) gene is necessary for SAD-1 localization, but the converse is not true. The data suggest that SAD-2 may function to recruit SAD-1 to the perinuclear region, and that the proper localization of SAD-1 is important for its activity.

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