Meiotic silencing by unpaired DNA.

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Abstract:
The silencing of gene expression by segments of DNA present in excess of the normal number is called cosuppression in plants and quelling in fungi. We describe a related process, meiotic silencing by unpaired DNA (MSUD). DNA unpaired in meiosis causes silencing of all DNA homologous to it, including genes that are themselves paired. MSUD might be a way to inactivate new transposable element insertions that remain unpaired during meiosis, a time of high vulnerability to transposition.
semidominant Neurospora mutant, Sad-1, fails to perform MSUD. Sad-1 suppresses the sexual phenotypes of many ascus-dominant mutants. MSUD may provide insights into the function of genes necessary for meiosis, including genes for which ablation in vegetative life would be lethal. It may also contribute to reproductive isolation of species within the genus Neurospora. The wild-type allele, sad-1(+), encodes a putative RNA-directed RNA polymerase.

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