

**P012** Investigating the requirement of Spo11-induced double-strand breaks for normal single-strand resection during meiosis

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Correct segregation of homologous chromosomes during meiosis I is essential in order to prevent nondisjunction events that lead to aneuploidy in gametes or spores. To ensure correct segregation, physical connections are made between homologous chromosomes by the process of recombination. This recombination is initiated in meiosis by double-strand breaks (DSBs) created by the Spo11 protein. Following DSB formation, endo / exonuclease activity resects DNA in a 5'-3' direction, producing single-stranded tracts of DNA. The ssDNA invades the duplex DNA of the homologous chromosome for repair. There is evidence that as well as initiating DSBs in meiosis, the number of Spo11p breaks may influence the outcome of recombination. For example, the presence or absence of Spo11-DSBs affects resection tract length at a site-specific DSB created by another meiosis-specific endonuclease, VDE.

By using alleles of *SPO11* that produce a wide range of DSB frequencies, it is possible to ask at what level these breaks have an influence on VDE-DSB processing. This approach has previously been used to look at the level of Spo11-DSBs required for correct synapsis. We are also assessing the importance of *EcoRI* and Topoisomerase II induced damage, in the absence of Spo11p activity, to ask whether or not wild type regulation of VDE-DSB repair specifically requires Spo11p activity and / or a high frequency of DSBs in the cell.