

P014 The *Arabidopsis thaliana* meiotic nuclear division 1 homologue plays a key role in meiotic homologous recombination and synapsis

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Mnd1 has recently been identified in yeast, as a key player in meiotic recombination. Here we describe the identification and functional characterization of the *Arabidopsis* homologue, *AtMND1*, which is essential for male and female meiosis and thus for fertility. Axial elements and sister chromatid cohesion are formed normally in mutant plants, recombination initiation appears to be unaffected, but chromosomes do not synapse. During meiotic progression, a mass of entangled chromosomes, interconnected by chromatin bridges, and severe chromosome fragmentation has been observed. These defects entirely depend on the presence of AtSPO11-1, a protein that initiates recombination by catalyzing DNA double strand breaks formation. Furthermore, we demonstrate that the AtMND1 protein interacts with AHP2, the *Arabidopsis* protein closely related to baker's yeast Hop2, a feature apparently conserved in yeasts, mammals and plants but not in worms and flies. These data demonstrate that AtMND1 is a key protein in homologous synapsis and in double strand break repair during meiotic recombination.