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Spatial/Nuclear Organization

P06

Fragile 45S rDNA in Festuca and Festulolium hybrids: explanation to genomic stability

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Fragile sites (FSs) are chromosomal regions prone to form gaps or breaks and it has been described in 45S rDNA of Lolium. However, there are no reports of its occurrence in Festuca, closely related to Lolium, and Festulolium hybrids, although both have showed chromosome fragments after conventional staining with DAPI. However, analysis of the cell cycle and DNA content indicate no elimination of DNA. We investigated if the presumed chromosomal fragments in F. arundinacea and Festulolium are related to FSs in 45S rDNA and if neocentromeres are responsible by genomic stability. 45S rDNA sites were detected by FISH and chromosomes were counterstained with DAPI and YOYO. We also used H3S28ph- and CENH3-specific antibodies to detect active centromeres. Neocentromeres were neither observed in the presumed fragments nor in any other chromosomal region. FISH and YOYO staining revealed chromosomes with extended NOR-regions forming thin YOYO-positive chromatin fibers. These fibers connected the acentric 'fragment' to chromosomal regions with centromeres, therefore both parts are not completely separated. It is likely that chromatin fibers are efficiently condensed during subsequent stages of the cell cycle, explaining genomic stability in Festuca and Festulolium hybrids.

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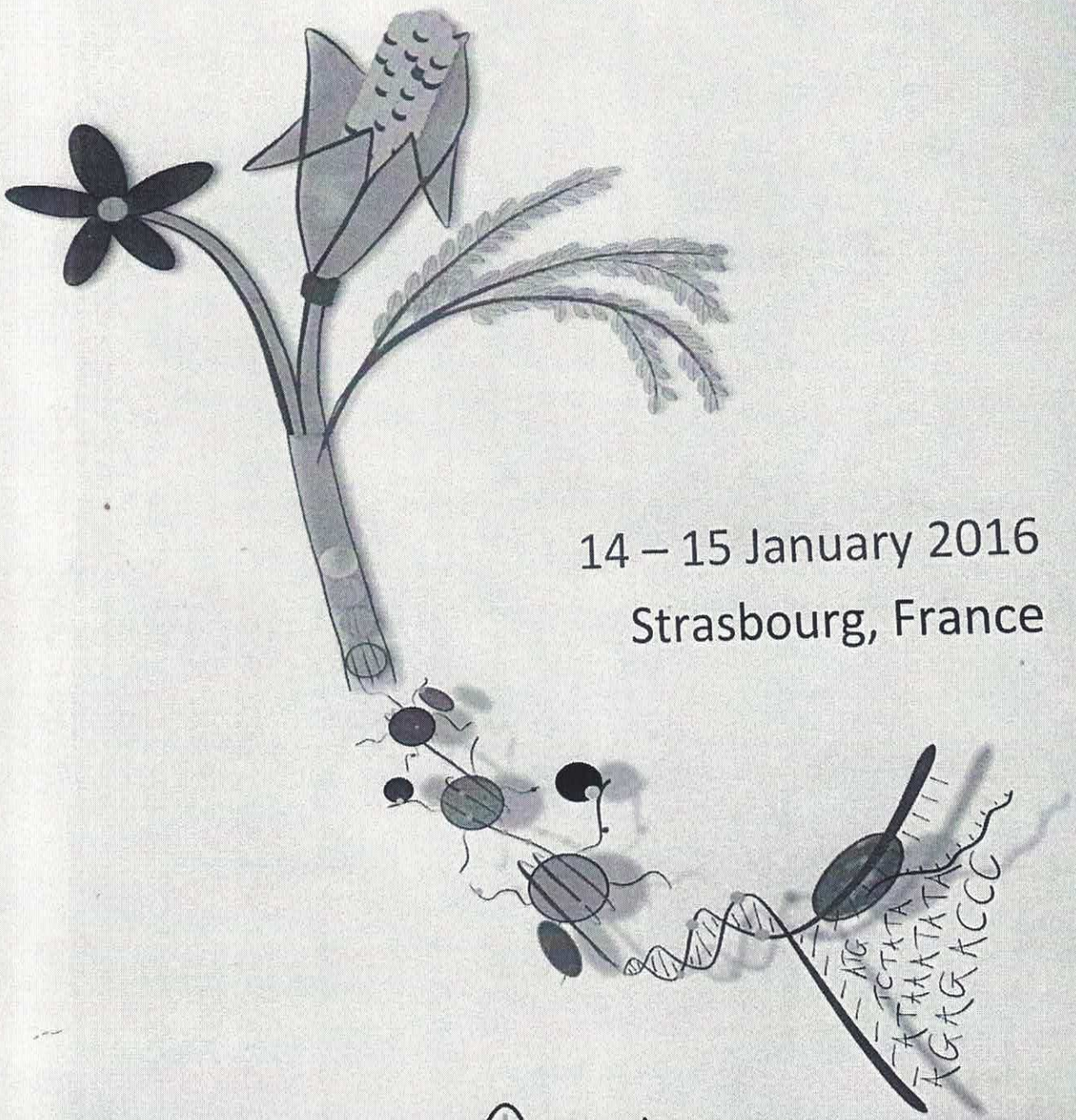

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