017(F017)

A CELL PLATE- LOCALIZED ARABIDOPSIS ENDO-1,4-β-GLUCANASE IS ESSENTIAL FOR CYTOKINESIS

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The formation of the cell plate, a unique structure in dividing plant cells , is pivotal for cytokinesis. A mutation in the Arabidopsis *KORRIGAN (KOR)* gene causes the formation of aberrant cell plates, incomplete cell walls, and multinucleated cells, leading to severely abnormal seedling morphology. *KOR1* encodes an endo-1,4-β-glucanase with a transmembrane domain and two putative polarized targeting signals in the cytosolic tail. When expressed in tobacco BY2 cells, a KOR1-GFP fusion protein was localized to growing cell plates. Our results suggest that KOR1 plays a critical role during cytokinesis.

018(F018)

CONSTRUCTION OF CHROMOSOME-SPECIFIC LIBRARY IN MAIZE

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The goal of this research was (1) to describe the conditions and parameters required for the cell cycle synchronization and the accumulation of large number of metaphase cells in maize root tips, (2) to isolate intact metaphase chromosomes from root tips suitable for characterization by flow cytometry, and (3) to construct chromosome-specific libraries from maize. Plant metaphase chromosomes have been successfully synchronized and isolated from maize root-tips. Individual chromosome peaks have been sorted from the maize B73. Libraries were generated from the DOP-PCR amplification product from each peak. To date, we have analyzed clones from a library constructed from the maize chromosome 1 peak. Hybridization of labeled genomic DNA to clone inserts indicated that 24%, 18%, and 58% of the clones were highly repetitive, medium repetitive, and low copy, respectively. Fifty percent of putative low copy clones showed single bands on inbred screening blots, and the remaining 50% were low copy repeats. Single copy clones showing polymorphism will be mapped using recombinant inbred mapping populations. Repetitive clones are being characterized by Southern blot analysis, and will be screened by *in situ* hybridization for their potential utility as chromosome specific markers.

019(F019)

EFFECT OF HEPARIN ON TRANSCRIPTIONAL ACTIVITY OF PEA CHLOROPLAST NUCLEOIDS

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Nucleoid is subject to extensive morphological and molecular changes during the development of plastid to chloroplast. Chloroplast nucleoids were isolated from leaf buds of pea on the day 7 after sowing. We investigated the transcriptional activities of the nucleoids *in vitro* under various conditions. The transcription was inhibited more than 90% by actinomycin D or tagetitoxin, which suggested that plastid-encoded RNA polymerase (PEP) mainly functions in this system. α-Amanitin and rifampicin had no effect. Heparin activated the transcription by 3-5 times. In tabacco chloroplast nucleoid, it was reported previously that heparin did not inhibit the transcriptional activity. When pea nucleoids were treated with heparin, a 70-kDa protein, which is the main component of the nucleoid, was released. The transcriptional repressor released by heparin is being identified.

020(F020)

CLONING OF NUCLEAR-ENCODED T7 PHAGE-TYPE RNA POLYMERASE GENES FROM *Physcomitrella patens*

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Nuclear-encoded T7 phage-type RNA polymerases (RpoT) are present in organelles in plants. In addition, prokaryotic RNA polymerase is encoded in the plastid genome. To analyze the role of RpoT, we isolated two cDNA clones for *RpoT* from *P. patens*. They were named *PpRpoT1* and *PpRpoT2*, which encode putative polypeptides of 1087 and 1065 residues, respectively. Putative transit sequence was found in each of the products. We will report about the organelle localization of GFP-fusion proteins, as well effects of gene disruption.