during early seed germination (MGCNL Vols. 47, 48). The inhibitor has since been purified by affinity chromatography on immobilized catalase (Sorenson and Scandalios, Biochem. Biophys. Res. Comm., in press), and we have determined that it is a protein. We are currently screening inbred maize lines for quantitative inhibitor variants in hopes of defining the structural gene for the inhibitor. The results of the first screening series are shown in Figure 1 (preceding page). The inhibitor levels in these lines fall into three groups, 0-10 inhibitor units/mg protein, 20-30 i.u./mg and a high level group of approximately 50 i.u./mg for which the range has not yet been defined. Although there is only one inbred line in this category in the data presented, initial measurements of a second group of inbreds show several more lines which fall into the high inhibitor category.

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Effect of ethanol on meiotic chromosome behavior — Ethanol was introduced on filter paper into the tassel area at meiotic stages during a three-hour temperature elevation from about 25°C to 36°C. Microsporocyte samples were collected just before treatment, immediately following treatment, and at 5 hours, 7 hours, 24 hours and 48 hours following treatment initiation. Pre-treatment samples were found to be normal.

Desynapsis at synizesis and pachytene was common in all post-treatment samples, occurring with a distribution which suggests treatment damage of existing synaptonemal complexes. Decondensation was often found in chromosomes fixed at diplotene to metaphase I at all intervals following treatment. Bivalents were often dissociated to dyads or monads at metaphase I in 24-hour and 48-hour samples; nearly complete separation of bivalents to univalents was occasionally found at diakinesis in 24-hour samples. Polyspory was found at the quartet stage in a 24-hour sample.

Chromosome 10 rod bivalents at diakinesis were studied in material heterozygous for K10, collected and fixed immediately following treatment (material was therefore at late pachytene to diakinesis during treatment). In such rod bivalents open at the K10 end, the knob sometimes appeared to be disjunctionally separated and sometimes to be equationally separated (with a K10 knob at each end). This is considered to be evidence of treatment-induced chiasma failure following crossing

over between K10 and the centromere. It is not known whether treatment at pachytene reduces crossover frequency; further studies are in progress.

It is hoped that this report will draw attention to the apparent potential value of ethanol treatment techniques for the study of meiotic chromosome structure and behavior.

Stocks which have so far been subjected to ethanol treatment include KYS and Coop stocks heterozygous and homozygous for K10 and elongate (el). Similar effects were observed in all stocks with the following astonishing exception: frequent bivalent interlocking at diakinesis was found in a 24-hour sample from one el plant. This is described below.

Marjorie Maguire

Induced bivalent interlocking — In a sporocyte sample from a phenotypically el plant collected and fixed 24 hours after initiation of ethanol treatment (described above), clear bivalent interlocking at diakinesis was frequent. Diakinesis material collected from this plant before treatment appeared completely normal. From the affected sample 15 cells each showed two pairs of bivalents interlocking, four cells showed three pairs interlocking and four cells each had a chain of three interlocked bivalents; only nine cells were seen which had no evidence of interlocking at diakinesis. Many cells (119) contained chromosomes too clumped for analysis, and many of these may have been interlocked. Only five metaphase I cells were available in squash preparations from this sample; of these, one cell showed two sets of apparently interlocked bivalents, and one cell showed one pair of such bivalents.

It is unlikely that cells at diakinesis 24 hours after treatment initiation were less advanced than pachytene (complete synapsis) at the time of treatment initiation. Thus, bivalents probably already completely synapsed at treatment seem to have been induced somehow to interlock by diakinesis in many cells.

It is not known whether the el trait expression is in any way related to the bivalent interlocking seen. No such interlocking has been seen in diakinesis slides from another el plant similarly treated or from any other treated plants. Further studies are underway.

Marjorie Maguire

Possible clustering within anthers of sporocytes with crossovers in specific regions — A common impression among cytogeneticists who have examined large numbers of sporocytes in smear preparations is that cells with cytologically recognizable products of crossing over in specific regions tend to be found close together in pairs or larger clusters. This is unexpected since anther contents