Transformation Laboratory Tours, May 7-8, 2001

Eight wheat and barley scientists from MN, ND, and WI met with scientists and students at Manhattan, KS and Lincoln, NE for laboratory tours and discussions on transformation. When we arrived at KSU's Throckmorton Hall, we first met with Dr. John Fellers, a molecular biologist with the USDA-ARS. John's lab houses several high-throughput pieces of equipment, including a DNA sequencer and automated robot. He discussed several of his projects on identifying specific wheat sequences, including those related to scab resistance. We then moved on to the wheat cytogenetics facilities where Dr. Bernd Friebe showed us through labs involved in cytogenetics and molecular biology. The cytogenetics group has developed numerous genetic wheat stocks, including many alien substitution lines. They also conduct fluorescent in situ hybridization (FISH) and genomic in situ hybridization (GISH) experiments to determine incorporation patterns of alien chromatin and transgenes. After a short break, we met with Drs. Harold Trick and Subbaratnam Muthukrishnan, along with their postdocs, technicians, and students. Several of them presented their research progress and we discussed transformation and testing methods before going on a tour of their laboratory facilities. Discussions continued during dinner and after replacing a flat tire, we were on our way to Lincoln for the night.

On Tuesday morning, we began our tour of the University of Nebraska facilities at Beadle Hall. Dr. Tom Clemente started with a short presentation about the transformation core facility. Shirley Sato followed with a walking tour of the wheat transformation facility. She showed us their protocols for Agrobacterium inoculation, plus methods of testing for the expression of the selectable marker gene in putative transgenic plants. We then briefly toured greenhouse and growth chamber facilities in the building before moving on to Keim Hall on the East Campus. There we had presentations by Drs. Marty Dickman and Amit Mitra on the rationale behind the genes they use for transformation, by Julie Schimelfenig on scab screening procedures, and by Dr. Stephen Baenziger on the breeding approach for these genes. These talks stimulated discussions that continued during and after lunch. We then had a short meeting on the best timing of a tour of the St. Paul and Madison labs (September), and finished the tour with a walk through the greenhouse containing the transgenic seed increases.