

“Keys of Corn” Project Overview and Learning Goals

Overview of Experiments

The list of experiments below is an incomplete list of the labs that they students perform during the course. These experiments replace earlier experiments in which students learned to use traditional recombinant DNA cloning methods. For a complete list of experiments use in the course see the sample syllabus or fall semester schedule of labs.

Week 1: Identify full length (flcDNA) Transcription Factor (TF) clones in GenBank. Order these from Arizona Genomics Institute.

Week 2: Isolate and sequence plasmid DNA (template for PCR)

Week 3: Amplify Open reading Frame from flcDNA clones

Week 4: Clone PCR amplified TF ORFs into Gateway Entry vector and transform into E. coli.

Week 5 (may be combined with week 6): Isolate plasmid DNA (optional students or teaching assistant), Obtain insert Sequence and verify that Entry clones are without error.

Week 6: Transfer clone into a variety of Gateway Destination vectors

Learning Goals and Skills

- 1: Finding full length maize cDNA (*database mining skill*)
- 2: Isolate the cDNA clone (*plasmid isolation, bacterial culturing, UV spectrophotometry, skills*)
- 3: Amplify the cDNA open reading frame (*PCR, DNA electrophoresis, skills*)
- 4: Clone the PCR product into Gateway® Entry Vector (*DNA cloning, bacterial culture, skills*)
- 5: Clone verification and transfer into Destination vector (*Sequence analysis and DNA cloning analysis skills*)
- 6: Analyze cloned gene/protein using bioinformatics tools (*conceptual skills and bioinformatics skills*)
- 7: Write up a detailed report (*scientific writing skills*)