E214 Molecular Cytological Studies about Host Cell Division Induced by Geminivirus in *Arabidopsis*

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Beet curly top virus (BCTV) is a single stranded DNA virus that is proving useful for basic studies of the interaction of Arabidopsis with a viral host and provides a symptom for studying both resistance and the molecular basis of symptom development. We have characterized and developed the new experimental system to analyze the virus inducible host cell divisions. In BCTV-Arabidopsis , in particular, Sei-O ecotype was found to be 'hypersusceptible'to the BCTV-Logan strain in that it developed very severe symptoms, including severly deformed inflorescences with callus-like structures, and accumulated high levels of viral DNA. We have further defined the factors important for symptom developmnt caused by BCTV using a molecular genetic approach based on expressing BCTV-encoded proteins in transgenic plants by using vacuum infiltration transformation method. Morphological observations of these studies indicate the BCTV ORF L4, is a primary symptom determinant. And Southern and Northern data show very close correlations between pseudo-synptom development and expression of virus protein in transgenic plants. We are currently utilizing the molecular immunocytolical approaches to localize L4 protein in the cellular and subcellular levels with transformed Arabidopsis.

E215 Regulation of Nitrite Reductase and its Transcript Level in Hot Pepper(*Capsicum annuum* L.)

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A cDNA clone of nitrite reductase(NiR) was isolated from a cDNA library of a month-old hot pepper plants using nir partial clone of 581 bp as probe obtained by degenerative PCR to genomic DNA. The nir clone is 2,277 bp long with an open reading frame encoding 589 amino acid residues. The region of cDNA clone overlapping nir partial clone revealed some differences in nucleotide and deduced amino acid sequence. Genomic southern blot analysis indicated the presence of 2 nir genes, supporting the same result by NiR electrophoretic isozyme assay. Addition of nitrate to the medium increased transcript levels of nir in cotyledons, but light itself had negligible effect on the nir transcript level. Nitrate treatment with white light had synergistic effect. NiR proteins were detected in considerable amounts even before the treatment of nitrate by western blot. When both nitrate and white light were treated, the sudden increase in NiR activity was shown without the concommitant increase in NiR protein level. The increase in nir transcript level far exceeded that of NiR protein, of which discrepancy remains to be explained. The presence of 2 isoforms in NiR may be a clue for an answer. One form of NiR may be synthesized consitutively while the other one is synthesized only by nitrate induction. It is possible that the newly synthesized transcripts encode one form of enzyme activated by nitrate and light treatment. The other form existing in substantial amounts may have lower activity lacking induction and activation by nitrate treatment.