Diagnosis (D51-D56)

D-51. Use of pepper SAR8.2 genes as a molecular marker for biotic and abiotic stresses in *Capsicum annuum*. S. C. Lee and B. K. Hwang. Laboratory of Molecular Plant Pathology, College of Life and Environmental Sciences, Korea University, Seoul 136-701, Korea.

Pepper SAR8.2 genes, designated CASAR82A, B and C, were isolated from a pepper cDNA library constructed with the mRNAs from the pepper plants infected by *Xanthomonas campestris* pv. *vesicatoria*. A characteristic feature of the putative pepper SAR8.2 proteins is the presence of a cysteine-rich domain at the C-terminus. The pepper CASAR82A, B and C gene products that are very similar to each other in amino acid sequences have 43-50% homology with those of tobacco SAR8.2 genes. The CASAR8.2 genes were not constitutively expressed in all the organs of healthy pepper plants. In contrast, the CASAR82A gene was locally or systemically induced in pepper plants infected by either *X. campestris* pv. *vesicatoria*, *Colletotrichum coccodes* or *Phytophthora capsici*. Significantly strong induction of CASAR82A gene also were found in pepper leaves treated with either of ethylene, methyl jasmonate, indole-3- acetic acid, abscisic acid, salicylic acid, benzothiadiazole, DL--n-amino butyric acid or hydrogen peroxide. Interestingly, the transcription of CASAR82A gene was rapidly triggered by high salinity, drought or low temperature stresses, but not by mechnical wounding. *In situ* hybridization results revealed the CASAR82A mRNAs were localized in phloem and epidermal cells of pepper leaf and stem tissues infected by *C. coccodes* and *P. capsici*, or treated with salicylic acid. Our results suggest that pepper SAR8.2 genes may be valuable as a molecular marker for the detection of various pathogen infection, abiotic elicitors and environmental stresses.

D-52. Detection of *Apple scar skin viroid* in apples by the isothermal nucleic acid amplification method NASBA and ECL detection technology. Hyun Ran Kim, Sin Ho Lee, Bong Nam Chung, Gug Seoun Choi, Jeong Soo Kim, and Yong Mun Choi. Division of Horticultural Environment, National Horticultural Research Institute, Rural Development Administration, Suwon 440-441, Korea

A rapid and sensitive assay for the specific detection of *Apple scar skin viroid*(ASSVd) using Nucleic acid sequence-based amplification(NASBA) and electrochemiluminescence(ECL) detection technology was developed. The Nucleic acids were isolated from symptomless young leaf discs of ASSVd-infected plant by silica-based nucleic acid isolation methods. NASBA assay of the ASSVd was optimized(70mM KCl, P1 and P2 primers) and biotin-labelled specific capture probe was designed complementary to the internal nucleotide sequence of the viroid DNA. RNA amplification reaction was accomplished isothermally at 41Ć by coordinate actions of AMV-reverse transcriptase, RNase H and T7 RNA polymerase. Amplified ASSVd RNA was detected by ECL after hybridization to common capture and specific detection probe. It was faster and more sensitive than RT-PCR assay for ASSVd in apple leaves. This is the first report that this new technology was applied successfully for the detection of viroid pathogen.