(W- I -1) :

GENE TRAMSFPRMATION TECHNOLOGY IN DICOTS

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Genetically altered crops, into which new genes have been introduced, are moving out of the lab and into the field at the rapid pace in recent years. Many of them are already appeared in supermarkets and kitchens, at least in the U. S. A. Clearly, gene transformation technology is in fashion. Methods of transfer DNA from one organism to another were already known in the 1940s. In plants, however, the major breakthroughs for introducing foreign DNA were the development of shuttle vectors for harnessing the natural gene transfer system of *Agrobacterium tumefaciens* and use of these vectors in direct transformation system. Most of the genetically engineered crops are dicots such as tomato, squash, cotton, soybean, canola, potato, cantaloupe, and sunflower, which are susceptible to *Agrobacterium tumefaciens*. Use of direct gene transfer techniques to introduce DNA into plant protoplasts, like PEG-uptake and electroporation, also have been used to generate stably transgenic plants, though this technique has been more widely used to study transient expression of DNA-construct and gene promoters. But, the usefulness of these gene transfer methods in dicots is heavily dependent upon the efficiency of gene transfer to cells and tissues which are highly regenerable. There are several components involved in the frequency of plant regeneration and gene transformation. In this workshop, I would like to discuss about factors influencing selection efficiency, plant regeneration, and genetic transformation, hardening-off, and field application in dicots based on the results obtained from ginseng, potato, Chinese cabbage, broccoli, hot pepper, and chicory in last few years in my lab.

(W- I -2) :

GENE TRANSFORMATION TECHNOLOGY IN MONOCOT

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The bialaphos is a potent inhibitor of glutamine synthease in higher plants and is used as a non-selective herbiside. We have used the bialaphos resistant (Bar) gene encoding for an acetyltransferase isolated from Streptomyces hygroscopicus SF1293. Callus derived from mature seeds of rice (*Oryza sativa* L. cv. Dong Jin) were co-cultivated with *Agrobacterium tumefaciens* EHA101 carring