

Genes Expressed During Late Seed Development

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Late maturation of seeds is marked not only by water loss but also by a drastic change in profile of proteins synthesized. Protein synthesized during this late stage, which are correlated with desiccation tolerance, ABA content, or transition to seedling growth, are often termed maturation proteins or late embryogenesis-abundant (LEA) proteins. Maturation proteins are slightly different from LEA proteins in that the messages for maturation proteins are not necessarily present at a relatively high level as LEA message during late embryogenesis. Based on the commonly shared amino acid sequence domains, LEA proteins are grouped into five groups. Most of the LEA proteins are highly hydrophilic, contain no Cys or Trp residues, and are boiling-soluble. It has been hypothesized that LEA proteins may play a protective role in plant cell under various stress conditions and this protective role may be essential for the plant under extreme stress conditions.

*We have isolated a number of cDNA clones of soybean seed maturation proteins from a pod-dried seed cDNA library by differential screening. These are designated GmPM clones, denoting for Glycine max physiologically mature. There are 41 GmPM clones been sequenced and characterized. Among these clones, one, three, six, five and two clones belong to group I, II, III, IV and V LEA proteins, respectively. Several of the others are for the storage of useful legends, such as biotin, calcium and zinc. Some of them are similar to cold-induced proteins, some are enzymes, and some are novel proteins. These GmPM messages are present in different tissues in the seeds and in different compartment inside the cells. Most of the GmPM proteins extracted from seeds are boiling soluble, and their corresponding recombinant proteins extract from *E. coli* are also boiling soluble. Transgenic plant assay for their biological functions are also carried out.*

The Arabidopsis genome sequence data are now available. And the EST databases of several plant species accumulate dramatically. The GmPM homologs in other species are picked up and studied.

Key words: gene expression, late seed development, LEA, Gm PM

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