immunoelectrophoretograms cannot be reproduced in the News Letter).

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Drew Schwartz

2. Regulation of alchohol dehydrogenase (ADH) activity in developing maize endosperm.

In immature seeds, high levels of ADH activity are found in both the embryo and the endosperm. During late stages of maturation, the activity decreases strikingly in the endosperm but remains high in the scutellum. The level of activity of an enzyme depends upon the rate at which it is synthesized, as well as the rate at which it is degraded or inactivated. The Adh_1 gene is probably not active in mature endosperm, but gene repression can not account for the rapid disappearance of ADH activity during the late stages of maturation. The rapid drop in activity must be a result of inactivation of preexisting enzyme. This process has been shown to involve two components, both present in the mature endosperm, which readily inactivate ADH *in vitro*. One component is a protein and the other is dextrin; neither has any effect by itself.

In the tissues which contain active ADH, only one of the components can be found. The embryo contains only the protein. The immature endosperm contains a high level of dextrin, but the protein component can not be detected until the stage of development at which ADH activity rapidly declines.

In order to be effective in the inactivation process the dextrins must be in a certain size range. Large molecules such as starch, glycogen, and even commercially available dextrins are ineffective unless hydrolyzed; prolonged hydrolysis reduces effectiveness. Furthermore, the dextrin must

be branched as hydrolyzed amylose does not have any effect.

The protein component has been characterized and partially purified. It is heat labile and has a molecular weight of approximately 120,000.

Inactivation has been shown to involve only the active site of the enzyme without altering the overall configuration of the molecule, since the inactivated enzyme retains its antigenic specificity. The inactivation is reversible; 70-80% of initial activity can be recovered by 2-3 hours incubation at 55°C. This reactivation may result from destruction of the heat labile protein component in the complex.

This two factor system might be involved not only in the control of ADH activity in the endosperm, but also in inactivation of ADH in other tissues, such as the root and the plumule during germination.

The role which this system plays *in vivo* is being tested by the use of a mutant which does not synthesize the protein factor in the embryo.

Dina Fischer

3. Genetic differences between ADH_1 isozymes revealed by dissociation and reassociation experiments.

Two unlinked alcohol dehydrogenase (ADH) genes, Adh_1 and Adh_2, are found in maize (Schwartz, 1966, Freeling and Schwartz, 1973). ADH_1-FF and ADH_1-SS, the products of two alleles at the Adh_1 locus, differ in their electrophoretic mobilities.

A dissociation and reassociation procedure (freezing in high salt followed by thawing and dialysis) described by Hart (1971) has been adopted recently for dissociation and reassociation studies of ADH in maize. These studies lend further support for the dimeric structure of these isozymes, as concluded from genetic and electrophoretic analysis (Schwartz and Endo, 1966).

If reassociation is a random process, mixtures of crude extracts with equal ADH activities from Adh_1^F/Adh_1^F and Adh_1^S/Adh_1^S kernels should yield dimers in a ratio 1 FF:2 FS:1 SS upon dissociation and reassociation, comparable to *in vivo* subunit assembly in Adh_1^F/Adh_1^S heterozygotes.

In zymograms of such reassociated extracts a deviation from this expected ratio is observed. The isozyme band pattern obtained approximates a ratio of 4 FF: 4 FS: 1 SS, as if only one half of the ADH_1^S