Komma, D. J. Columbia University, New York. Differential assay of G-6-PD produced by individual X-chromosomes in heterozygous D. m. females.

Glucose-6-phosphate dehydrogenase (G-6-PD) is produced by structural genes carried on the X chromosome of D. melanogaster (Young et al., 1964). Two alleles are known at the locus: ZwA (fast electrophoretic form) and ZwB (slow form)(Young, in press). A method has been developed here for measuring the ZwB form of the enzyme in the presence of ZwA. The key factor is the presence or absence of NADP (micotinamide-adenine dinucleotide phosphate) in the buffer in which the flies are homogenized. The standard buffer used here is a 0.05 M tris(hydroxymethyl)aminomethane-HCl buffer, pH 7.5, containing 0.01 M EDTA. The table shows the G-6-PD levels of homozygous ZwA, homozygous ZwB, and ZwA/ZwB females when 1) NADP (0.3 mg/ml) was present in the buffer at the time the flies were homogenized, and 2) when NADP was omitted from the buffer and not added until the assay was made. Activity is expressed as change in O.D. per minute per milligram of protein.

| | ZwA | ZwB | ZwA/AwB |
|---|---|---|---|
| 1) NADP present | .11 | .15 | .14 |
| 2) NADP absent | .00 | .12 | .02 |

The reason for the small amounts of ZwB in the heterozygotes is unknown. The effect seems to be real, since more ZwA than ZwB is also observed when heterozygotes are subjected to electrophoresis (cf. Young et al. 1964). In mixtures of the two homozygous types, the resultant activity when NADP is omitted is exactly the value expected if only the ZwB is being measured. (Research supported by NIH Grant #5-T1-GM-216-07.)

References: Young, W. J., J. E. Porter and B. Childs, Science 143:140, 1964
Young, W. J., J. Hered., in press

Chen, P. S. and Hanimann, F. Zoologisches Institut der Universität, Zurich, Switzerland. Qualitative and quantitative analysis of free ninhydrin-reacting components during the development of D. melanogaster by the automatic amino acid analyzer.

Using the automatic amino acid analyzer (Spackman, Stein and Moore, 1958) a detailed study of the changes in free amino acids, peptides and related compounds during the post-embryonic development of D. melanogaster has been carried out. The stages included larvae aged 1-4 days, pupae aged 1-3 days as well as one day old female and male adult flies. The samples used had usually a concentration of 0.3-0.5 g fresh weight per 2 ml methanol extract.

Qualitatively this technique is superior to paper partition chromatography. For example, leucine, isoleucine and phenylalanine can be separated very satisfactorily. The basic amino acids like lysine, histidine and arginine, which usually show low resolution and diffuse spots on paper chromatograms, also give rise to distinct peaks. Furthermore, we have found a considerable amount of ammonia which has thus far escaped our detection by paper-chromatographic analysis.

Of special interest is the appearance of more than ten acidic peptides and other related derivatives, all of which were eluted from the column before aspartic acid. Although no significant qualitative changes of these compounds have been revealed, the quantitative variations at various stages are however quite evident. During larval development their total content drops from about 9 to 6% of all free ninhydrin-positive compounds. At the time approaching puparium formation it increases rapidly to about 18%, and thereafter remains at a rather high level (12-18%) until the adult stage. Three components (fractions 3, 6 and 8) are especially concentrated and each of them has its own specific pattern. Such variations must be related to the metabolic processes that underlie the morphogenetic events. With help of the preparative column and the stream-divider attachment, large amounts of these peptides and derivatives have been collected for more detailed chemical analysis which is now in progress.