Berendes, H. D. Max Planck Institut f. Biologie, Abt. Beermann, Tübingen, Germany. The effect of ecdysone analogues on the puffing pattern of D. hydei.

Changes in the puffing pattern of mid-third instar salivary gland chromosomes occurring after injection of two ecdysone analogues have been compared with the changes observed after injection of ecdysone (1). The two compounds tested were: 2β,3β,14α,20ζ,22β$_F$, 25-hexahydroxy-Δ^7-5β-cholestenon-(6), described as ecdysterone, crustecdysone or polypodine A (2), and 2β,3β,dihydroxy-5β-cholestenon-(6). Both compounds were kindly supplied by Prof. Šorm. The ecdysterone isolated from Polypodium vulgare L. differs in its chemical composition from ecdysone (2β,3β,14α,22β$_F$, 25-pentahydroxy-Δ^7-5β-cholestenon-(6); (3)) by one additional hydroxyl group. The second compound contains three hydroxyl groups less than ecdysone and the Δ^7 double bond is absent. This sterol derivate inhibits the post-ecdysial hardening and sclerotization of the cuticle of the bug Pyrrhocoris apterus L. For this reason it was assumed that this substance has an ecdysone-antagonistic action (4).

Injection of 1 µl of a Ringer solution containing 25 µg of ecdysterone into mid-third instar larvae resulted in drastic changes of the puffing pattern of the salivary gland chromosomes. Observations made at 10 min. and at 4 hours after injection demonstrated the presence of the complete series of activity changes of the chromosomes known to occur during a 6 hour period preceding puparium formation (5) and also after experimental administration of ecdysone (1).

Injection of the second compound (15 µg/µl) also produced the activation of ecdysone-specific puffs. The puffs 78B (fig. 1), 87C, 95D and 97A become active or increase their activity within 10 min. after injection, and puffs 77BC and 61B become active at 4-5 hours after injection. In contrast to the observed effect of this substance on the cuticle hardening and sclerotization of Pyrrhocoris, no indication of an ecdysone-antagonistic action could be detected in D. hydei on the basis of the activity changes at the chromosomal level. Moreover, this substance reproduced the changes in gene activity pattern normally produced by ecdysone. It may be concluded from these data that small changes in the molecular composition of ecdysone, i.e., the addition or subtraction of hydroxyl groups and the removal of the double bond, does not alter the specific effect on the genome of D. hydei.

Fig. 1. Activity of puff 4-78B at 10 min. after injection of 15 µg/µl 2β,3β,dihydroxy-5β-cholestenon-(6).

Further analogues have to be tested to determine the part of the molecule that is responsible for the specific activation and inactivation of particular genes.

Lit: (1) Berendes, Chromosoma 22 (1967); (2) Jizba et al., Tetrahed. Letters 18 (1967); (3) Huber and Hoppe, Chem. Ber. 98 (1965); (4) Hora et al., On Steroids CIII, Coll. Czech. Chem. Comm. (1967); (5) Berendes, Chromosoma 17 (1965).

Klingele, Sr. Dorothy. University of Notre Dame, Notre Dame, Indiana. Recombinational analyses of the lz^D and lz^{61f} alleles.

Recombinational studies involving the spectacle mutants lz^D and lz^{61f} of the lozenge pseudoallelic series were carried out utilizing the female-fertile lz^{50e} allele. Four recombinant males were found among the 10,062 individuals scored in the lz^D series, whereas no recombinants were observed in the 24,096 F_2 males scored in the lz^{61f} experiments. It seems reasonable to suppose a homoallelic relationship between lz^{50e} and lz^{61f} with assignment of lz^{61f} to the left-most sub-locus of the complex. The recovery of recombinants in the lz^D/lz^{50e} series, establishes a heteroallelic nature of these alleles. The calculated map distance, 0.08 units, agrees favorably with the 0.083 map units determined as the distance between the left-most sub-locus and supports the preliminary placement of lz^D at the lz^1 sub-site.