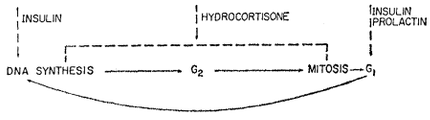

Fig. 4. The action of hormones in relation to cell cycle of mammary epithelium.

effects of insulin may be observed when fructose is substituted for glucose in the synthetic medium.

These results and those reported recently (*4, 5*) constitute a partial resolution of the multiple hormone requirements of this system. It appears that the covert and overt differentiative phases of development in mouse mammary gland in vitro are separable on both a temporal and hormone-dependency basis. Insulin is the hormone involved in the stimulation of mammary epithelial cell proliferation. However, if cell proliferation is permitted to occur in the absence of hydrocortisone, the new cells are incapable of subsequently differentiating (as judged by casein synthesis and histological development) in response to the presence of all three hormones. On the other hand, cells formed in the absence of prolactin (that is, those formed in a medium with insulin and hydrocortisone) can subsequently respond in the medium with all three hormones.

The action of the hormones in relation to the mammary epithelial cell cycle may then be depicted as in Fig. 4. Insulin is involved in the initiation of DNA synthesis (*3–5*) and is required during the phase after mitosis (G_1). Prolactin can elicit the overt differentiative responses after mitosis. Hydrocortisone activity precedes that of prolactin; it is not capable of eliciting a differentiative response after mitosis. It is not known which of the other phases of the cell cycle—DNA synthesis, G_2 (the period between the cessation of DNA synthesis and the commencement of mitosis), and mitosis—coincide with the covert action of hydrocortisone.

Table 1. Epithelial cells incorporating tritiated thymidine and undergoing mitosis during a 5-day culture period in the presence of insulin. Abdominal mammary glands of a C3H/HeN nulliparous mouse halfway through pregnancy (10 to 12 days) were removed with aseptic technique. Explants (0.5 to 1.0 mg) were prepared and cultured in sterile Medium 199 (Microbiological Associates). Insulin was added to a final concentration of 5μg/ml. Explants used for the study of DNA synthesis by autoradiography were exposed to 1 μc of tritiated thymidine (specific activity, 6.0 c/mmole) for 24 hours prior to fixation at the designated time. After fixation in Bouin's solution, explants were sectioned at 5 μ, and the slides were dipped in liquid photographic emulsion. Explants taken for histological examination were fixed, sectioned at 7 μ, and stained with Delafield's hematoxylin. Similar results were obtained when explants were cultured in the presence of all three hormones—insulin, hydrocortisone, and prolactin.

Length of incubation (hr)	Cells incorporating thymidine-H^3 (%)	Mitotic figures (No./1000 epithelial cells)
0		10
24	42.6	23
48	44.9	7
72	3.6	1
96	1.5	1
120	1.1	1

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Automobile Paint Effective as an Insect Attractant

Abstract. *Two acrylic auto paints were effective attractants for sap beetles,* Stelidota geminata *(Say) and* Glischrochilus fasciatus *(Oliver). Response to the synthetic lures was sufficient to encourage additional testing of their potential in survey and control programs.*

Endemic populations of nitidulids have been present in Michigan for many years and have been reported in weekly surveys (*1*), but not until 1966 did *Stelidota geminata* suddenly reach outbreak proportions in parts of southwestern Michigan and become a serious pest of strawberries in some counties. Estimates of losses for the 1966 strawberry season exceeded $3,000,000 (*2*). During the outbreak of *S. geminata* on 16 July 1966 in East Lansing, Michigan, so many *Glischrochilus fasciatus* responded to a paint container and to the spots of new paint on an automobile that the painting of rust spots on the car had to be stopped (*3*). The paint being used was General Motors midnight blue, Dupli-Color touch-up, stock No. DP-GM 44 (*4*).

Members of the various species of nitidulids are associated with a saprophytic existence. They are attracted to many kinds of decomposing vegetation, particularly fermented fruit juices; some live on flowers, fungi, and carrion, and a few are predacious (*5–7*). Nearly all except the genus *Carpophilus* lack economic importance, though some are a considerable nuisance around public picnic areas. Other genera have been listed as pests of corn, especially sweet corn, in the North Central states (*8*), and *Glischrochilus* spp. have been associated with worm-damaged ear corn in Michigan (*1*).

Specific studies of the attraction of the Nitidulidae to synthetic lures have not been reported. However, Dorsey and Leach (*9*), who were investigating the comparative attractiveness of tree wounds to insects, found that *Stelidota geminata* (Say) and *Glischrochilus fasciatus* (Oliver) were important vectors of oak wilt. Also, Daugherty and Brett (*6*) included some attractant work in their investigations of nitidulids on sweet corn and found that when banana pulp was used as the attractant, nitidulids from five genera, including *G. fasciatus* and *Stelidota* spp., collected at their bait stations.

The results obtained with *G. fasciatus* led us to a field investigation of paints as an attractant for *S. geminata*. A series of paints was exposed in vials containing a wick saturated with 2 ml/vial and suspended on sticky board field traps in Berrien County, Michigan. These traps were yellow cards (Fig. 1) suspended from a pole 2 to 3 feet (0.6 to 0.9 m) above ground. Replicates were placed within a pear orchard, within a strawberry patch adjacent to the pear orchard, and within a strawberry patch adjacent to a vineyard. Collections were highest within the strawberry patch adjacent to the pear orchard and lowest within the strawberry patch adjacent to the vineyard. Initial response occurred near dusk, an indication of crepuscular behavior. As the season progressed, the nitidulids dispersed into the cherry and peach orchards adjacent to the

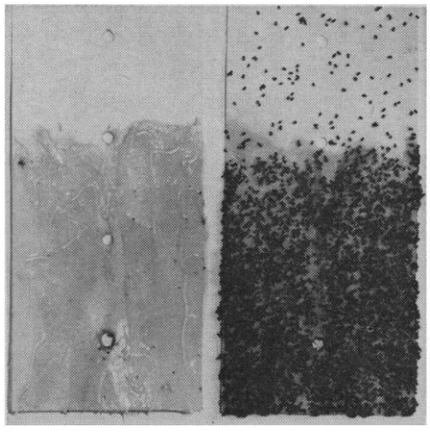

Fig. 1. Sticky board traps used for nitidulid attractant studies. (Left) Control; (right) baited with paint primer.

test plots where partially decayed, fallen fruit became heavily infested with both larvae and adults. Subsequent infestation occurred in cull tomatoes and melons that had been distributed throughout the area, and lure traps were placed near them as the infestations occurred.

Results attained during the week of 20 July revealed an acrylic primer, a Dupli-Color product (DP-GM-3), to be the attractant for *S. geminata*. Some individual traps collected more than 3000 beetles.

Later tests made with a series of paint pigments, concealed vials, and colored papers confirmed that the response was to odor, not to color. Periodic testing of the paint primer during July, August, and September indicated that timing of application will be of major concern when the primer is used in a control program.

Field testing of the individual components of the primer during the latter part of August failed to indicate the active component. However, the season had advanced beyond the period of peak flight, and the response to our standard acrylic primer was negligible.

During our field investigation, two dipterous species also responded. An undetermined species responded to the acrylic primer, and *Olcella parve* Adams, reported by Jantz and Beroza (*10*) as being attracted to caproic acid, responded to amyl butyrate and ethyl butyrate.

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Two Types Of Lambda Polypeptide Chains In Human Immunoglobulins

Abstract. *Two antigenic subtypes of human lambda polypeptide chains were distinguished by rabbit antiserum produced to a lambda Bence Jones protein. Lambda Bence Jones proteins and G myeloma proteins with lambda light chains were identified as being in one or the other subtype. The Oz (+) lambda chain subtype is present in light chains from pooled normal human immunoglobulin G and in whole normal immunoglobulin G molecules.*

Knowledge of the heterogeneity within the immunoglobulin system has been advanced through immunochemical studies of Bence Jones proteins and related immunoglobulins. Heterologous antiserum has been useful for identifying subclasses of gamma polypeptide chains in man (*1*) and mouse (*2*) and in identifying genetic factors within the heavy-chain subclasses (*3*). Heterologous (rabbit) antiserum also has been used to identify two major types (κ and λ) of light polypeptide chains in human and mouse immunoglobulins (*4*). We found rabbit antiserum valuable for identifying two subtypes of lambda light polypeptide chains in human immunoglobulins.

Rabbits were immunized with λ-type Bence Jones proteins emulsified in Freund's complete adjuvant. Antiserums to 14 different Bence Jones proteins were tested, and only one antiserum (R98), prepared to Bence Jones Oz, distinguished two subtypes of lambda Bence Jones proteins. The subtype specificity was present only in blood collected over a 2-month period from this rabbit. The antiserum was rendered specific for lambda determinants by absorption with hypogammaglobulinemic serum and G myeloma protein, type K.

The specific anti-λ serum was tested against a panel of 22 lambda Bence Jones proteins which had been purified by precipitation with 80 percent ammonium sulfate, followed by zone electrophoresis, anion-exchange chromatography, or Sephadex gel filtration, or a combination of these techniques. Only the 4*S* peaks from gel filtration were used, eliminating the possibility that differences could be attributed to comparison of whole Bence Jones protein with fragments of the protein (*5*). Antigenic differences were noted on Ouchterlony analysis where the precipitin lines formed by some Bence Jones proteins, Oz (+), spurred over the precipitin lines of adjacent Oz (−) proteins (Fig. 1, left).

The observation of antigenic differences among the lambda Bence Jones proteins was extended by regrouping the proteins and comparing them in separate groups. When the Oz (+) proteins which formed spurs (Fig. 1, left) were placed in neighboring wells, reactions of identity were seen. A similar pattern was observed when the Oz (−) proteins, that is, those without spurs, were in adjacent wells. These findings indicate the existence of two categories of Bence Jones protein, those with an antigen detected by antiserum R98, Oz (+), and those without this antigen, Oz (−).

The antigenic relations of these two categories of lambda Bence Jones protein were further investigated by individual absorption with 18 Bence Jones proteins and testing of the capacity of the absorbed R98 antiserum to react with the panel of Bence Jones proteins. Absorption with a typical Oz (−) Bence Jones protein removed the ability of the antiserum to precipitate Oz (−) protein, while Oz (+) proteins continued to show strong precipitin lines (Fig. 1, right). Absorption with eight Oz (+) Bence Jones proteins removed