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Remodeling of the Abdominal Epithelial Monolayer during the Larva-Pupa-Adult Transformation of *Manduca*

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ABSTRACT

During metamorphosis of insect epithelial monolayers, cells die, divide, and rearrange. In *Drosophila* undifferentiated diploid cells destined to form the adult cuticle of each abdominal segment segregate early in development from the surrounding polyploid larval epithelial cells of that segment as eight groups of diploid histoblast cells. The larval polyploid cells are programmed to die and be replaced by divisions and rearrangements of histoblast cells. By contrast, abdominal epithelial cells of *Manduca* larvae form a monolayer of cells representing different ploidy levels with no definitive segregation of diploid cells destined to form adult structures. These epithelial cells of mixed ploidy levels produce a thick smooth larval cuticle with sparsely distributed sensory bristles. Adult descendants of this larval monolayer produce a thinner cuticle with densely packed scale cells.

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