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Ecdysone Triggers the Expression of Golgi Genes in *Drosophila* Imaginal Discs via *Broad-Complex*

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Abstract

One of the most significant morphogenic events in the development of *Drosophila melanogaster* is the elongation of imaginal discs during puparium formation. We have shown that this macroscopic event is accompanied by the formation of Golgi stacks from small Golgi larval clusters of vesicles and tubules that are present prior to the onset of disc elongation. We have shown that the fly steroid hormone 20-hydroxyecdysone triggers both the elongation itself and the formation of Golgi stacks (V. Kondylis, S. E. Goulding, J. C. Dunne, and C. Rabouille, 2001, *Mol. Biol. Cell*, 12, 2308). Using mRNA *in situ* hybridisation, we show here that ecdysone triggers the upregulation of a subset of genes encoding Golgi-related proteins (such as *dnsf1*, *dsec23*, *dsed5*, and *drab1*) and downregulates the expression of others (such as *dergic53*, *dβ'COP, anddrab6*). We show that the transcription factor Broad-complex, itself an “early” ecdysone target, mediates this regulation. And we show that the ecdysone-independent upregulation of *dnsf1* and *dsnap* prior to the ecdysone peak leads to a precocious formation of large Golgi stacks. The ecdysone-triggered biogenesis of Golgi stacks at the onset of imaginal disc elongation offers the exciting possibility of advancing our understanding of the relationship between gene expression and organelle biogenesis.

Keywords

Golgi stacks; Golgi proteins; ecdysone; Broad-complex; gene expression; *in situ* hybridisation; FISH; immunofluorescence

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