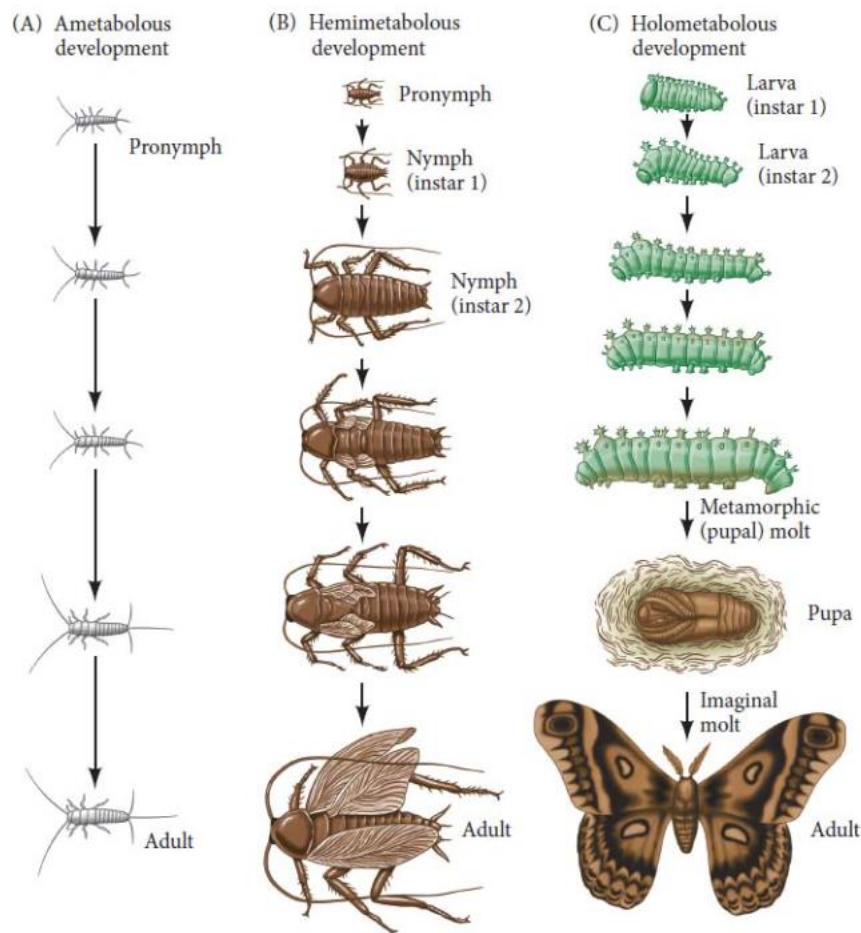
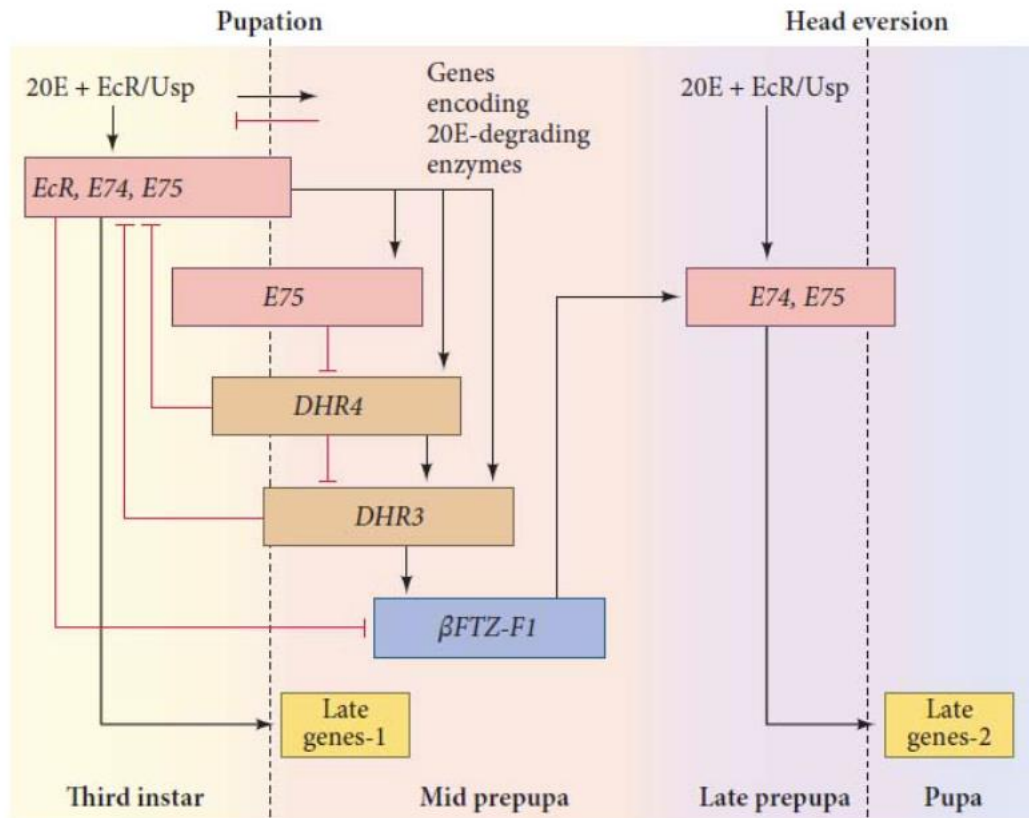


Identification of 20-Hydroxyecdysone as a Metamorphic Transcriptional Regulator



Modes of insect development. Molts are represented as arrows. (A) Ametabolous (direct) development in a silverfish. After a brief pronymph stage, the insect looks like a small adult. (B) Hemimetabolous (gradual) metamorphosis in a cockroach. After a very brief pronymph phase, the insect becomes a nymph. After each molt, the next nymphal instar looks more like an adult, gradually growing wings and genital organs. (C) Holometabolous (complete) metamorphosis in a moth. After hatching as a larva, the insect undergoes successive larval molts until a metamorphic molt causes it to enter the pupal stage. Then an imaginal molt turns it into an adult that ecloses from the pupal case with a new cuticle.



20-hydroxyecdysone initiates developmental cascades. (A) Schematic of the major gene expression cascade in *Drosophila* metamorphosis. When 20E binds to the EcR/Usp receptor complex, it activates the early response genes, including *E74*, *E75*, and *Broad*. Their products activate the “late genes.” The activated EcR/Usp complex also activates a series of genes whose products are transcription factors and which activate the *βFTZ-F1* gene. The *βFTZ-F1* protein modifies the chromatin so that the next 20E pulse activates a different set of late genes. The products of these genes also inhibit the early-expressed genes, including those for the EcR receptor. (After K. King-Jones et al. 2005. *Cell* 121: 773-784)

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