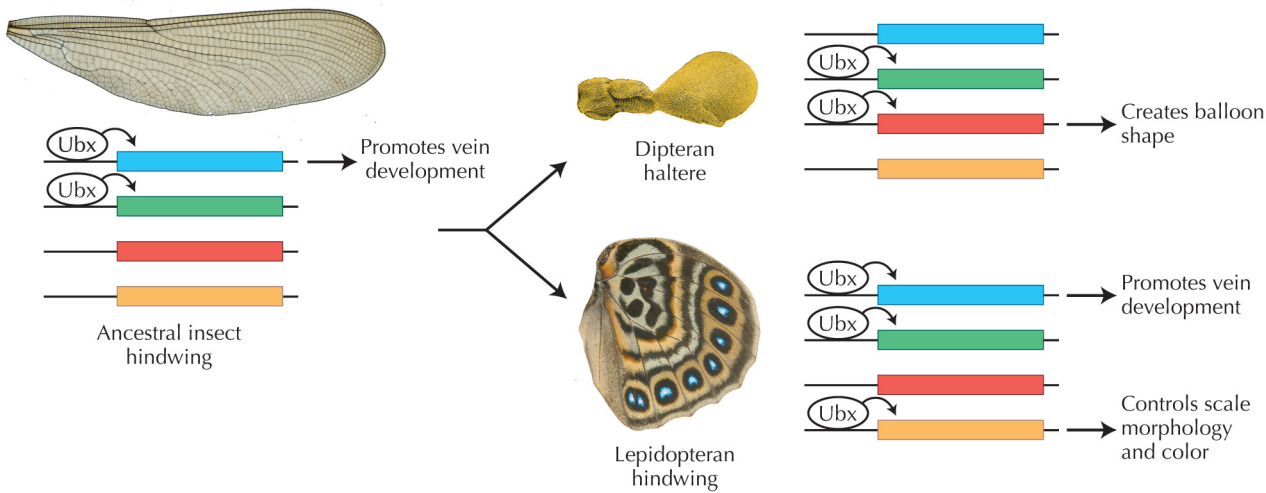


**FIGURE 11.12.** Evolutionary changes in the targets of *Ubx* regulation have led to the diversification of insect hindwings and halteres (T3 appendages). Given that *Ubx* is expressed in similar spatial domains in the primordial of various hindwings and halteres, the diversification of these structures would appear to involve changes in the genes that are regulated by *Ubx* (through the binding of Ubx protein [*ovals*] to the enhancers of these genes). For example, *Ubx* may have promoted vein development in the ancestral hindwing and continues to do so in extant Lepidoptera, but no longer does so in the veinless halteres of diptera. On the other hand, a novel function of *Ubx* in regulating scale and color patterning appears to have evolved in the lepidopteran lineage; similarly, function in creating the balloon-like shape of the haltere may have emerged during the evolution of diptera.

**11.12,** adapted from Carroll S.B. et al., *From DNA to Diversity: Molecular Genetics and the Evolution of Animal Design, 2e,* p. 155, © 2005 Blackwell Publishing