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Homologous Specification

The molecules used by imaginal discs to specify positional information may be the same throughout the fly. That is, the discs may specify the respective fates of their cell by the same mechanisms. This is called homologous specification. Thus cells in the eye disc may respond to the same positional cues as cells in the leg disc. Homologous specification can be seen with certain homeotic mutants such as *Antennapedia,* in which antennal structures are transformed into legs (Postlethwait and Schneiderman 1971). Occasionally, the entire antenna becomes an entire leg, but is more common that only a portion of the antenna becomes leg-like. In the latter cases, the replacement is absolutely position-specific. The cells of the antenna disc that normally would have formed the distal tip of the antenna (arista) are transformed into the most distal portion of the leg (claw); cells specified to give rise to the second portion of the antenna are transformed into the second portion (trochanter) of the leg. The corresponding parts of the two structures are shown in Figure 1.

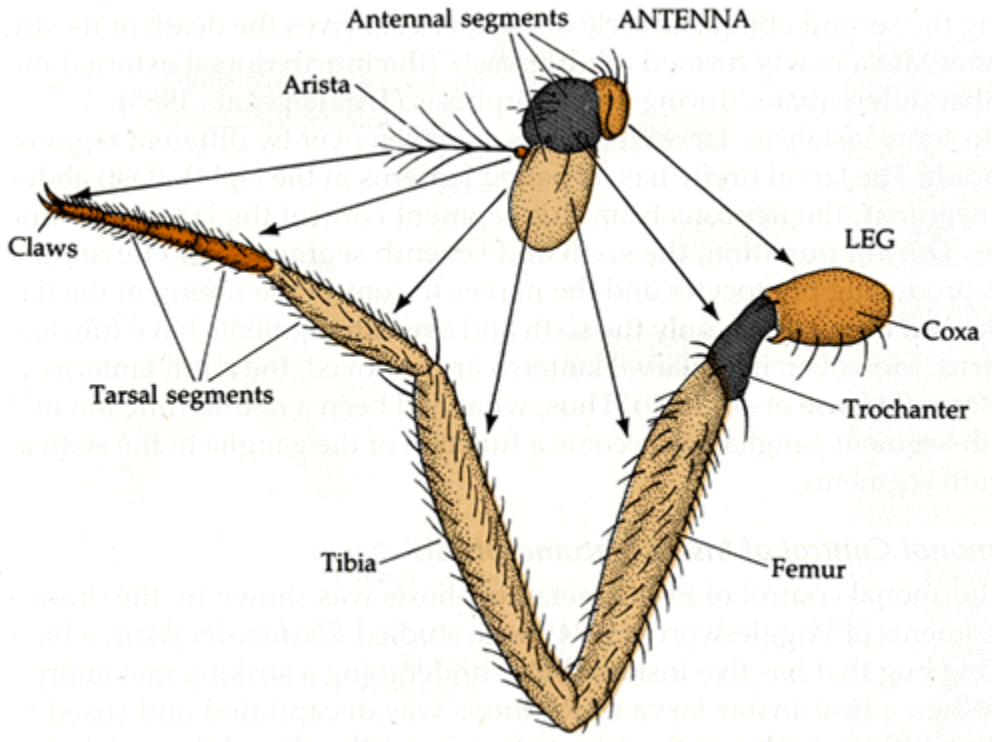

Figure 1 Correspondence between portions of the antenna and portions of the leg. In the mutant *Antennapedia*, regions of the antenna are transformed into leg structures. The arrows show the portions of the antenna that form specific corresponding portions of the leg. Such correspondence has also been seen in the transcription patterns of genes such as *salm*. (After Postlethwait and Schneiderman 1971).

Literature Cited

Postlethwait, J. H. and Schneiderman, H. A. 1971. Pattern formation and determination in the antenna of the homeotic mutant *Antennapedia* of *Drosophila melanogaster. Dev. Biol*. 25: 606-640.