

The great carrier of an insect: the *Drosophila* genetic model system

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The genetic „dissection”, i.e. isolation of mutants and their analysis, is the strategy which gives the highest „resolution” in the analysis of gene function and interaction. *Drosophila* with the knowledge of 100 years’ classical genetics, the whole armory of molecular biology and its full annotated genome sequence offers unique advantages for such studies in the post-genomic era. As a Holometabolous insect, it is especially suitable for studying the regulation of insect development and physiology.

The fruitfly system offers a unique collection of genetic techniques and resources: genetic transformation of any DNA sequence into the germline, manipulation of gene expression using the binary Gal4 system, disruption of nearly all the genes by transposon insertions, gene silencing (RNAi) by double-stranded (ds) RNA for the whole genome, targeted mutations by homologous recombination, mosaic techniques, etc.

The availability of the complete sequence of the *Drosophila* genome opened up a new dimension for research on gene networks and interactions. Lately, the genome sequences of 12 other *Drosophila* species have become available which offers further advantages for evolutionary studies.

In addition to many basic biological problems, the fruitfly system has given important contributions as well to the knowledge of insect hormones, especially ecdysone, the determination and development of the segmented body plan and the central nervous system. The talk brings up specific achievements in these fields connected to *Drosophila*.

