

**ANALYSIS OF FLIGHT MUSCLE DEFECTS IN ADULT *DROSOPHILA*  
BY ULTRAMICROSCOPY**

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Three-dimensional visualization of the complete flight muscle anatomy in intact adult *Drosophila* with micrometre resolution has been impossible up to now. Ultramicroscopy allows 3D reconstructions of the direct as well as indirect *Drosophila* flight muscles for the first time.

Generally, this approach is suited for detailed 3D-visualization of even cm-sized specimen (Dodt et al., 2007; Becker, Jährling et al., 2008). Ultramicroscopy is based on the principle of lightsheet illumination. Therefore, many drawbacks of histology, like mechanical distortions and misalignments of slices are eliminated. Because lightsheet illumination requires specimen to be translucent, we rendered *Drosophila* transparent by chemical clearing.

In a genome-wide RNAi screen, flight defective *Drosophila* were isolated. A number of these lines show strong flight muscle defects, suggesting a muscle formation defect or extensive muscle degeneration. In our ongoing study we investigate the morphology of individual muscles in the intact fly. This enables us to assign the observed defects to particular muscle classes.

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