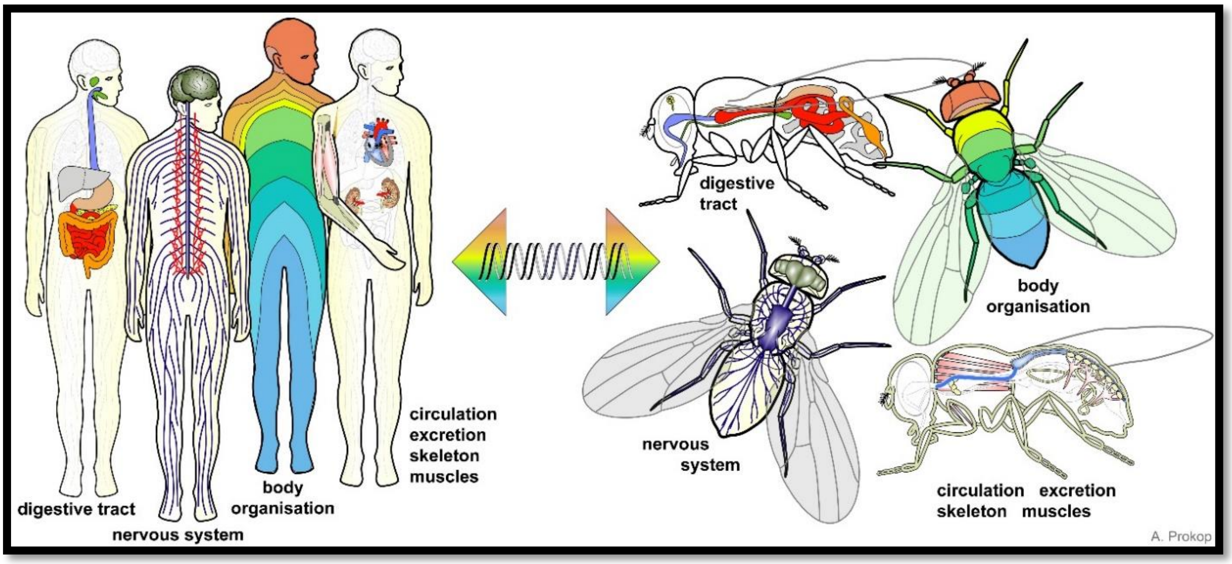
Photo: ***Drosophila melanogaster*** **(the fruit fly, bananflue på norsk).**

Drosophila Melanogaster**, the fruit fly.**
Small in size but large in its contribution to our understanding of numerous human diseases the fruit fly has played a leading role in the fields of developmental biology, genetics, cancer, and cell biology, to name just a few of the areas in which it has excelled. It's smaller and more compact genome when compared to other common model systems (fish, mouse, human cells) while still containing 75% of all human disease-related genes, has contributed to its attractiveness as a genetic model. The small fruit fly has a wide variety of genetic tools, more advanced than those of rival model systems, at its disposal, following over 100 years of use as a model system. Additionally, the ability to image all tissues during their development, coupled with the range of genetic manipulations possible gives a model system in which a gene or protein function can be assessed at a cell, organ and whole animal level with ease and speed. Welcome to the world of fly genetics where seeing is believing!

Drosophila **as a model for human diseases:** Several criteria make *Drosophila* a meaningful organism in which to model human diseases. Essentially, the majority of disease-related genes are conserved between the fruit fly and humans. In fact, as many disease-related genes are important for human and fly development these were often first described in the fruit fly. Due to the over 100-year-old tradition of naming fly mutations after how they look (the phenotype), many disease-causing genes are named after their fly counterparts, e.g. Hedgehog (abbreviated Hh), Wingless (Wg or Wnt), Grainyhead (Grh or Grh-like).



Additionally, the fruit fly's body plan and internal organs have human counterparts in developmental and functional terms. This is partly illustrated by the image above. To be more specific, during development we can take a human gene and use it to replace the function of a purposefully mutated fly gene. In this way, we can say the fly and human genes are so related they can do the same job (functional orthologs). Understandably, we can only check this relationship in one direction, putting human genes into the fly, not the other way around. In terms of organ functionality, we know that many of the cell types that make up human organs have fly counterparts and that these organs accomplish many of the same jobs (digestion, filtration, excretion, oxygenation, buffering starvation, behaviour, sensation) and produce or secrete much the same proteins or hormones to accomplish these tasks.