Title: From Smell to Behaviour in the Fly

Abstract

Our goal is to understand how smell turns into behaviour. The sensory neurons that detect odours are connected to brain areas that trigger behaviours or form memories by only one or two levels of processing; this is much more direct than vision.

We are studying olfactory processing in Drosophila. Although their brains are smaller and simpler, they have many organisational similarities to vertebrates. We have developed strategies to label and map neurons and record their electrical activity in vivo as flies smell different odours. One focus has been processing of sex pheromones that trigger different behaviours in the sexes. Recently we have described a neural changeover switch that reroutes pheromone information to different sets of target neurons in the male and female brain. This is the first time that such a circuit switch has been described in any animal and provides a perfect experimental system to understand the circuit basis of different behaviours.

Primary Articles


Identification of cVA receptor and demonstration of different behavioural effects of cVA pheromone in males and females.


Comprehensive description of sex differences in the fly brain.


Anatomical and functional tracing of pheromone signals through 4 levels of processing.

Reviews


Good general summary of study of sexually dimorphic behaviour in the fly.
