A Step-by-Step Guide to Studying *Drosophila melanogaster* Behaviour

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ZANTIKS
behaviour, simply
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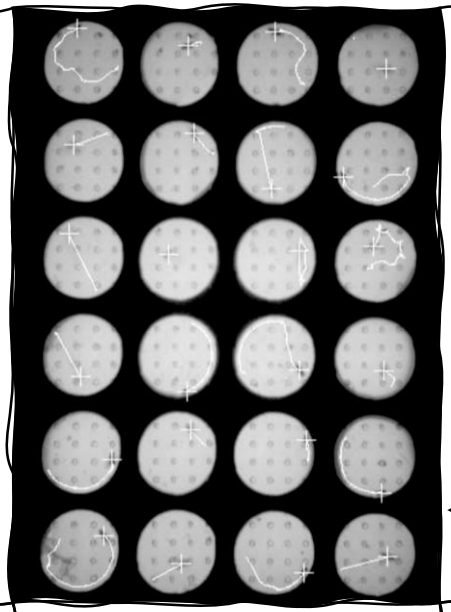
1 Identify Behaviour

Flies take flight in response to light-off stimuli

This is a startle response related to the evasion of looming stimuli



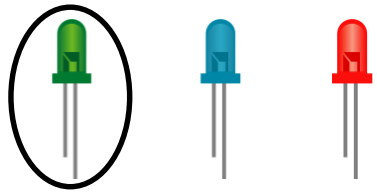
2 Choose an Appropriate Measure

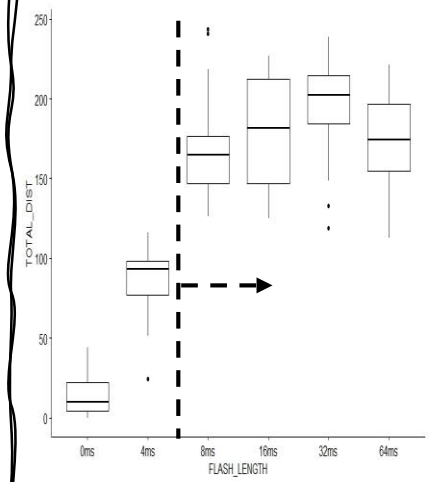
We measured the distance travelled by flies in 1 second intervals using the automated, real-time video tracking integrated in the Zantiks MWP unit →

← Flight is represented in the video by fast movements in straight lines

3 Characterising Behaviour

Flies startled most frequently to 530nm green light, when the LEDs were flashed off for 8ms or longer →



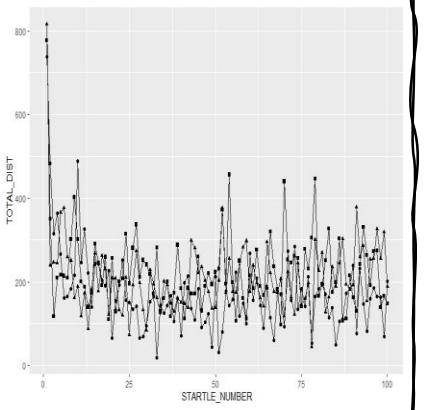


4 Replicate Known Effects

Fenckova et al. (2019) demonstrated habituation of the light-off startle response in white-eyed flies using the below parameters:

15ms FLASH
1s ISI
100 TRIALS

We replicated this effect in wild-type flies →

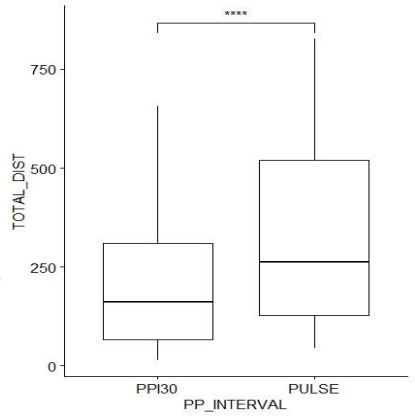


5 Establish Novel Effects

We observed pre-pulse inhibition of startle responses across a population of 24 flies

4ms PRE-PULSE
30ms INTERVAL
15ms PULSE

Pre-pulse + pulse (left) compared to pulse only (right) →



6 Publish

Open-source publication allows for transparent reporting of methods and findings by all

We plan to publish our research on bioRχiv, including our raw data, R scripts and Zantiks procedural scripts

bioRχiv
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7 Develop Ideas

In future, we wish to examine this dataset further, looking at response patterns of individual flies

Our methodology could provide a basis for investigations using genetic knockouts and pharmacological manipulations