Benzer’s Countercurrent Apparatus

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Abstract

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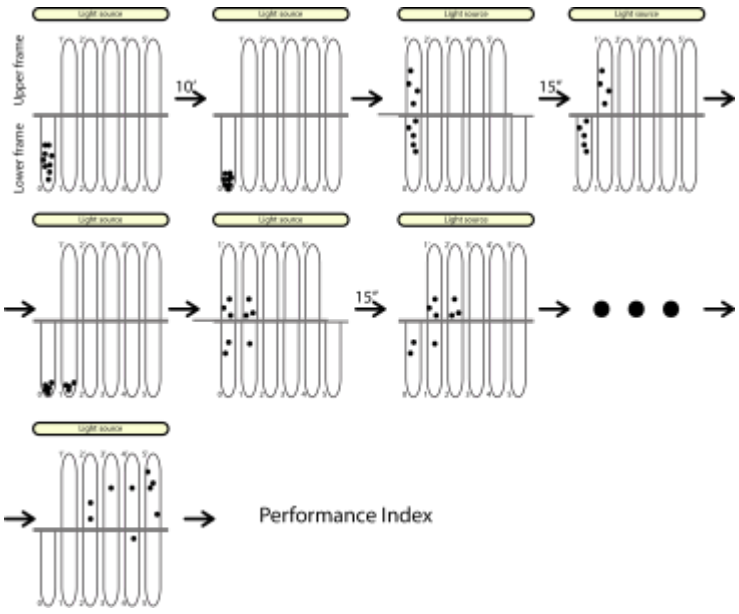
Guidelines

The Performance Index is calculated using the formula:

PI=((#F5×5)+(#F4×4)+(#F3×3)+(#F2×2)+(#F1×1)+(#F0×0))/(#FT)

where #Fn is the number of flies in the tube n (being 0 the initial tube and 5 the last tube), and #FT is the total number of flies. A higher index means a more positive response to light. In each experiment a PI is calculated for the wingless flies and other for the intact flies.



Protocol

Preparation

Step 1.
24h before the experiment, anesthetize 3-6 d old flies under CO2.

Preparation

Step 2.
Clip 2/3 from both wings to half of them.

Preparation

Step 3.

In the same vial, place around 30 flies with clipped wings and another unclipped 30 flies.

Preparation

Step 4.

Let them recover from anaesthesia until experiment begins.

Experiment

Step 5.

Place the flies in the first tube (0, see figure in Guidelines) and let them adapt for 10 min in the dark.

DURATION

00:10:00

NOTES

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The apparatus has to be horizontal in order to avoid a geotactic component in the response from flies.

Experiment

Step 6.

Turn on the light source.

Experiment

Step 7.

Place the apparatus vertically and tap it gently in order to move all the flies to the bottom of the tube.

Experiment

Step 8.

Immediately, place the apparatus horizontally with the upper frame facing the source of light, and face the tube 0 with the tube 1’ by moving the upper frame to the left.

Experiment

Step 9.

Let it so for 15 sec.

DURATION

00:00:15

Experiment

Step 10.

Move the upper frame to the right in order to prevent the flies from moving from one tube to another.

Experiment

Step 11.

Repeat steps 5-10 as many times as tubes in the upper frame you have (5 in our case).

Experiment

Step 12.

Count the number of flies with and without wings in each pair of tubes facing each other and in the 0 tube.

Experiment

Step 13.

Calculate the Performance Index. (see Guidelines for the formula)