

Behavioral Effects of Odorant Injection on Larvae and Eggs of *Bicyclus anynana*

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Abstract

Background A non-gustatory neural circuit was shown to alter dietary preferences in rodents.

Aim & Method To examine if a similar non-gustatory mechanism facilitate *Bicyclus anynana* learning a preference for a novel odor, we investigated the behavioral effect of injection of isoamyl acetate solution to larvae and eggs, and then that of their offspring.

Results The injected larvae's preferences were not altered, but those of their offspring were. Also, larvae from the injected eggs showed strong naïve preference for the odor.

Discussion Isoamyl acetate injections therefore may contribute a novel pathway for learning in *B. anynana*.



Background

Fact Food odor preference learning for a novel odor



Q Mechanism of learning and inheritance

Idea A non-gustatory neural circuit on food preference



Hypothesis

Larvae injection...

Egg injection...



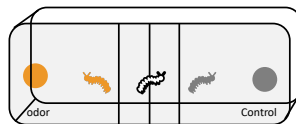
Materials & Methods

Operation Husbandry: 27°C, 60% humidity, and 12:12-hour light:dark photoperiod.

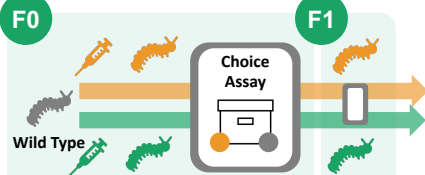
Injection

- Hamilton syringe needles
- Microinjection

Choice assay



Box: length 26.5cm, width 9cm, height 5cm. Randomizing setting direction. Test: recorded Odor/Control choice for the movement beyond larval body length, after 4 min, starting from the centerline.



Conclusion

Result 1

Injection of odorants may contribute to odor learning and its inheritance



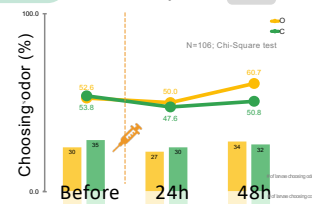
- Larvae injection F0
- Larvae injection F1

No change in odor preference
No sex difference

Increased preference for the odor

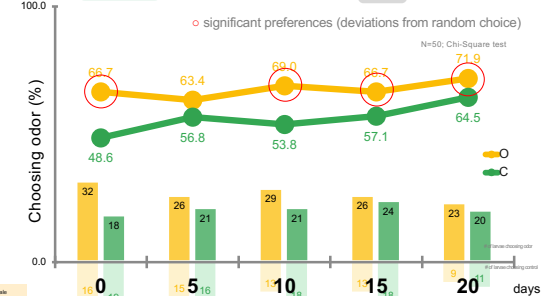
Exp. 1

Larvae injection **F0**

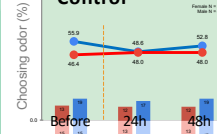


Exp. 2

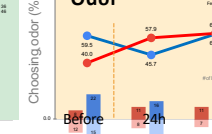
Larvae injection **F1**



Control



Odor



Result 2

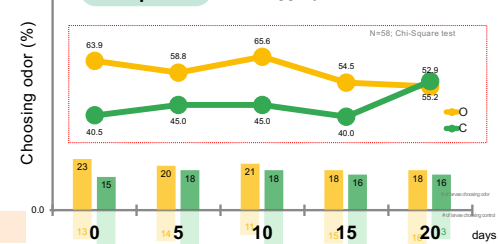
Larvae from injected eggs prefer the odor

- Egg injection

Increased naïve preference for the odor

Exp. 3

Egg injection



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