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Startle induced negative geotaxis (SING)

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We use this protocol and it's working



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Abstract

This protocol describes how to perform the Startle induced negative geotaxis (SING) assay. SING defects in parkinsonism fly models have previously been shown to be caused by dopaminergic impairments.



Startle induced negative geotaxis (SING)

30s

- 1 for the description of the SING apparatus please refer to:
Benzer, Seymour. 1967. "BEHAVIORAL MUTANTS OF *Drosophila* ISOLATED BY COUNTERCURRENT DISTRIBUTION." *Proceedings of the National Academy of Sciences* 58 (3): 1112–19. <https://doi.org/10.1073/pnas.58.3.1112>.

Inagaki, Hidehiko K, Azusa Kamikouchi, and Kei Ito. 2010. "Methods for Quantifying Simple Gravity Sensing in *Drosophila Melanogaster*." *Nature Protocols* 5 (1): 20–25. <https://doi.org/10.1038/nprot.2009.196>.
- 2 set a specific time period during the day (e.g. Zeitgeber 3-5) to assess negative geotaxis behavior, which will be kept the same for all following experiments
- 3 flies are transferred into the first tube of the apparatus without prior anesthesia and allowed to adjust
for some minutes to experimental environment (24±1°C, 40-60% humidity in behavior chamber, note down the environmental condition and time for every genotype)
- 4 tap the flies down five times and allowed to climb up for  00:00:30 30s
- 5 after these 30 s the flies that reached the upper tube are moved to the next tube
- 6 repeat the procedure 4 times
- 7 count the number N of (male/female) flies with the corresponding genotype per tube to calculate the SING score, which is normalized to the mean SING score of the control.
- 8
$$\text{SING score} = ((N_1 * 0) + (N_2 * 1) + (N_3 * 2) + (N_4 * 3) + (N_5 * 4)) / 4(N_1 + N_2 + N_3 + N_4 + N_5)$$

$$N_k = \text{number of flies in the } k\text{th tube}$$



Protocol references

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