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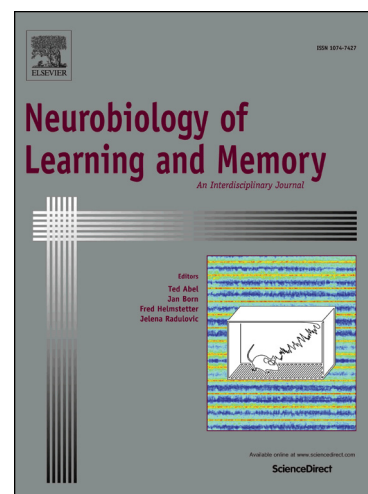
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# Transgenerational influence of sensorimotor training on offspring behavior and its neural basis in *Drosophila*

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## ABSTRACT

**Whether specific learning experiences by parents influence the behavior of subsequent generations remains unclear. This study examines whether and what aspects of parental sensorimotor training prior to conception affect the behavior of subsequent generations and identifies the neural circuitries in *Drosophila* responsible for mediating these effects. Using genetic and anatomic techniques, I find that both first- and second-generation offspring of parents who underwent prolonged olfactory training displayed a selective approach bias to the same trained odors. However, I also find that the offspring did not differentiate between orders based on whether parental training was aversive or appetitive. Disruption of both olfactory-receptor and dorsal-paired-medial neuron input into the mushroom bodies abolished this change in offspring response, but disrupting synaptic output from  $\alpha/\beta$  neurons of the mushroom body themselves had little effect on behavior even though they remained necessary for enacting newly trained conditioned responses. This study provides a circuit-based understanding of how specific sensory experiences in *Drosophila* may bias the behavior of subsequent generations, and identifies a transgenerational dissociation between the effects of conditioned and unconditioned sensory stimuli.**

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