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## Behavioral plasticity of an olfactory jump reflex in *Drosophila*

Survival in a constantly changing environment benefits from behavioral adaptation (learning), a phenomenon observed throughout the animal kingdom. To determine the mechanisms of learning, we study habituation of the olfactory jump response in *Drosophila*. This simple form of behavioral plasticity provides a rapid and robust assay for the isolation of genetic determinants of learning. The first step in determining the molecular mechanisms of habituation plasticity is the development of a stable paradigm. We have established protocols in which presentation of an olfactory stimulus elicits a defensive jump reflex in individually assayed flies. Importantly, repeated exposure to an odor decreases the probability of eliciting the jump reflex in a fly. As there are potential changes outside habituation that could also influence the probability of jumping (i.e. adaptation or fatigue), critical criteria must be met before bona fide habituation can be claimed. Most informative is the increase in jumping probability with presentation of a noxious cue following the repeated odor presentation (i.e. a dishabituation stimulus). Data supporting the conclusion that the olfactory jump response can indeed be habituated will be presented.