A Pair of Presumptive Sensory Neurons Inhibits *C. elegans* Egg-laying Behavior

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The simple neuromusculature that drives *C. elegans* egg-laying behavior is negatively regulated by Go signaling. Previously, we identified a G protein-coupled receptor, EGL-6, that functions to inhibit the HSN motor neurons in a Go-dependent manner and identified its ligands, FMRFamide-related peptides (FaRPs) encoded by the genes *flp-10* and *flp-17*. We analyzed the expression of *flp-10* and *flp-17* reporter transgenes to identify cellular circuits that use these FaRPs to control egg-laying behavior.

We detected expression of a *flp-10::GFP* reporter gene in six neurons, the head mesodermal cell and cells of the somatic gonad and vulva. Laser ablation of *flp-10::GFP*-expressing neurons in strains overexpressing *flp-10* only weakly suppressed the effects of *flp-10* overexpression, suggesting that the neuronal expression of *flp-10* we observed was not required for *flp-10* gene function. We observed *flp-17::GFP* reporter gene expression primarily in a pair of anterior neurons, the BAG cells, which are presumptive sensory neurons that have not been associated with a sensory modality. Laser-ablation studies using strains overexpressing *flp-17* and strains sensitive to the effects of *flp-17* deletion indicated that the BAG cells are the principal source of endogenous *flp-17* FaRPs. Our data also indicate that the BAG cells provide inhibition to the egg-laying system that is independent of *flp-17*. Our observations suggest that egg laying by *C. elegans* is under the control of a BAG cell-mediated sensory system. Association of the BAG cells with a sensory modality might identify environmental or internal cues that are salient for the control of this behavior.

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