

Genetic screening for suppressor mutation in *C. elegans odr-3* mutants

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A suppressor mutation is a mutation that negates the effects of a different, separate mutation, facilitating a return to the wild-type phenotype. In this experiment, a suppressor mutation screen of a mutation of the *odr-3* gene was conducted by observing the egg-laying behaviors of mutagenized *Caenorhabditis elegans* worms in different chemical stimulants, and comparing the results to the wild-type. A mutant with a successful suppressor mutation of an *odr-3* mutation will have similar egg laying behaviors to that of the wild-type (N2). The gene, *odr-3*, encodes a G protein α subunit that plays an integral role in sensory and olfactory neurons. The role *odr-3* plays is vital to olfactory sensation, osmoregulation, and mechanosensory function. In this experiment, two worm lines that each had an *odr-3* mutation and a potential suppressor mutation were generated, isolated, and tested: *odr-3-JC-17* and *odr-3-JC-66*. When serotonin was introduced, the *odr-3-JC-17* mutant strain showed a similar response in egg laying compared to the wild type, N2. The average number of eggs laid in an hour for each of the N2, *odr-3*, *odr-3-JC-17* and *odr-3-JC-66* strains in serotonin solution were 0.18, 0.33, 0.21, and 0.44 eggs/hour, respectively. In dopamine solution, *odr-3-JC-17* demonstrated similar egg laying behavior to N2. In a dopamine solution, the N2, *odr-3*, *odr-3-JC-17* and *odr-3-JC-66* strains laid 1.04, 2.25, 1.29, and 0.40 eggs/hour, respectively. When placed in an imipramine solution, *odr-3-JC-17* had a significantly higher value of eggs laid in an hour than the *odr-3* mutant. In imipramine solution, the N2, *odr-3*, *odr-3-JC-17*, *odr-3-JC-66* mutant strains laid 1.56, 1.53, 2.80, and 0.91 eggs/hour, respectively. These results indicate the presence of a suppressor mutation that is at least partially effective in the *odr-3-JC-17* mutant strain.