Discovering the Mysteries of Pha-4

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In the Mango lab, we study organogenesis in the pharynx of the Caenorhabditis elegans. The pha-4 gene specifies pharynx organogenesis during C.elegans embryogenesis.

• if there is no pha-4 present then there will be no pharynx.

• if there is excess pha-4, then excess pharynx is produced.

The goal of my research is to find out how pha-4 works and to identify its regulators and partners. We know that there must be other factors that work with pha-4 to regulate pharyngeal growth because pha-4 is expressed in all the pharyngeal cells. But there are 5 cell types, so there must be other factors contributing to differentiation among cells. We also know very little about how pha-4 itself is controlled and there may be regulators of pha-4 that are important for proper pharynx development.

We performed a suppressor screen for partners, regulators of pha-4. The screen introduces a series of random mutations in the worms using a chemical mutagen. We searched for mutations that allowed for the smg-1(ts);q500 strain to survive at 20° C.

We predicted that we would isolate 5 classes of suppressors:

1. Regulators of pha-4 (these

2. Partners of pha-4 (these work with pha-4 to turn other genes on or off.) c.. pha-4 itself (e.g. making the q500 protein more stable or more active ad therefore able to function at 20° C.) d.. smg-mutations (we are not interested in these because the effect is global and has nothing directly to do with pha-4.) 5. Down stream genes involved with pharynx development. For example ceh-22 or myo-2 target genes that pha-4 and partners control.

Ultimately, we hope to be able to map and eventually clone the suppressor mutation to identify factors that act on or with pha-4 in pharynx development.