Discovering the Mysteries of Pha-4

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.) e., 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.

Arash Mohajer
Class Standing: Junior
Major: Biology
Salt Lake City, Utah
E-mail: arashmohajer@hotmail.com

Faculty Mentor:
Susan E. Mango
Huntsman Cancer Institute
and Department of Oncological Sciences
E-mail: susan.mango@hci.utah.edu