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Using mutant roundworms to understand development: glh-4 was caught!

To understand development, scientists have utilized simple organisms including the soil roundworm Caenorhabditis elegans. The Bennett laboratory has utilized this nematode to study a family of proteins called germline RNA-helicases, or GLHs. Proteins similar to the GLHs are found in humans. A technique to temporarily knockout a gene's function, called RNA-interference, has revealed that these proteins are necessary for fertility and for establishing the reproductive system in C. elegans. However, strains of roundworms with genetic mutations in the genes that code for the GLHs are necessary to effectively study the protein's functions. While fishing to find a glh-4 deletion strain with millions of worms we had mutagenized, we were fortunate that the C. elegans Knockout Consortium in Vancouver, British Columbia found a glh-4 mutant and provided it to us. Initial analyses of the mutant strain glh-4 (gk225) by western blot analysis and by immunocytochemistry with anti-GLH-4 antibodies suggests that, as hoped, the mutation results in a strain of worms not producing the GLH-4 protein, a protein null. In addition, the glh-4 (gk225) strain was mated against normal wild-type worms for six generations to remove other mutations that may have been produced in the original mutagenesis. We are currently studying the mutant's phenotype and are generating a glh-1;glh-4 double with the glh-1(ok439) strain, as combinatorial RNAi indicates the loss of both glh-1 and glh-4 results in the most severe germline defects. By studying these genes and proteins, we can obtain a better idea of the machinery behind development and reproduction in worms and ultimately humans.