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Two maternally provided genes essential for *C. elegans* embryogenesis

Summary

The Hox gene *ceh-13* is one of the very first zygotically activated genes. It is expressed in the Ep cell and in certain cells in the AB lineage during early embryogenesis. We screened for mutations causing alternations in the early *ceh-13::gfp* expression. We have isolated several mutations and cloned two genes.

Loss of *tudr-1* function leads to a fully penetrant maternal effect early embryonic lethal effect. *tudr-1* has two distinctive domains namely an RNA recognition motif that is located at N terminus and a Tudor domain that lies in the center. The localization of the initial cell polarities are correct in tudr-1 (yt2 or RNAi) embryos. After the 4 cell stage the cell divisions and cell movements become abnormal and the mutants arrest as grossly disorganized embryos with ceh-13::gfp expressing cells distributed all over the embryo. By time-lapse video recording, we identified that the loss of tudr-1 function results in a similar phenotype as those mutations in DNA replication machinery.

Loss of *mel-46* in the *yt5* allele causes temperature sensitive maternal effect lethality with loss of the ceh-13::gfp expression. All embryos arrest without any signs of morphogenesis at the restrictive temperature of 25°C. In contrast, the deletion allele, *tm1739*, causes a zygotic larval arrest at L4 stage. This suggests the gene is required at least twice in the development. *mel-46* contains a highly conserved DEAD box helicase at the N terminus and is a putative ortholog of mammalian DDX20/Dp103/Gemin3. Preminary results show that the MEL-46 is expressed in the pachytene region of the adult gonads.

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