T-Box Regulation of PAX-1 in Caenorhabditis Elegans

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The focus of my study is to understand the roles of transcription factors and the development of the pharynx in Caenorhabditis elegans. Our objective is to determine if transcription factors that drive the development of the pharynx, such as TBRX-39, TBRX-40, and PHA-4 modulate PAX-1 expression. It is known that PHA-4 binds to the pax-1 promoter and it is necessary for PAX-1 expression. However, promoter analysis of pax-1 suggests the presence of multiple transcription factor binding sites. We are investigating if TBRX-39 and TBRX-40 T-box gene factors are among the factors that regulate the expression or timing of pax-1. Previous data from a one-hybrid yeast experiment indicated that there might be a possible interaction between TBRX-39 and TBRX-40 with the pax-1 promoter. Tba-39 and Tba-40 RNAi was used to remove the transcription factors to determine the expression level of PAX-1::EGFP expression during different stages of embryonic development. Our preliminary results show no significant change in the PAX-1::EGFP expression in the embryonic stage. Currently, we are optimizing the protocols and replicating the experiment. The results will help us better understand the roles of transcriptional activation during the development of the pharynx in C. elegans.