

Public Abstract

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Title:Dicer interacts with the P-granule component GLH-1; both localize to *C. elegans* nuclear pores and to stress-induced oocyte RNP granules

The research presented in this dissertation expands the basic scientific knowledge of the function of the *C. elegans* germline protein GLH-1 in germline development. GLH-1 is found in P granules, which are ribonucleoprotein complexes specific to the cytoplasmic side of the nuclear pores of *C. elegans* germ cells. P granules are implicated in post-transcriptional control of maternally-transcribed mRNAs, their function remains elusive. Through genetic studies our laboratory has shown that GLH-1 is essential for fertility; however, the biochemical function of the GLH complex is still unknown. With immunoprecipitations and GST-pull-downs, we found that GLH-1 and the ribonuclease Dicer, which is the key dicing enzyme in RNA interference, bind one another in complex. Our findings go on to show the regulation of Dicer, evidence indicates Dicer protein levels, like those of GLH-1, are regulated by proteosomal degradation and are much increased when the Jun N-terminal kinase KGB-1 is missing in the *kbg-1(um3)* null. This study is the first to report the localization of Dicer in the adult *C. elegans* germline and demonstrates that Dicer is located throughout the cytoplasm as well as at the inner nuclear pores of the germ cell nuclei, in close opposition to GLH-1. Under stress conditions in oocytes GLH-1 and DCR-1 both re-locate and recruit other components to large cytoplasmic RNP granules. The research presented here indicates that the GLH-1/DCR-1 complex may function in the transport, deposition, or regulation of maternally-transcribed mRNAs perhaps with their associated miRNAs.