

The Function of Cysteine Proteases in *Caenorhabditis elegans* Embryogenesis. (Master dissertation)

Abstract

Cysteine Protease (CP) enzymatic activity may play important role on animal development, for instance, cathepsins B, L and Z like cysteine proteases family play an essential role in early embryogenesis and normal growth in *Caenorhabditis elegans*.

C. elegans embryogenesis is a powerful in vivo model to study gene function because of its germline is highly sensitive to RNAi, facilitating the detection of genes with essential functions in the embryo. In this study we used RNA interference (RNAi) as a reverse genetic technique to knock down Cathepsin L, B and Z-like cysteine proteases in *C. elegans* as a genetic model animal to demonstrate the function of these enzymes in embryogenesis. *Cpl-1*, *Cpr-1* and *Cpz-1* RNAi, lead to embryonic lethal to F1 progeny, as well as *Cpz-1* RNAi leads to defects in cuticle region indicating the role of *Cpz-1* in molting. Furthermore, *Cpl-1* RNAi, leads to different phenotypic traits such as embryonic lethal, sterile and internal hatching for L1 larvae indicating that *Cpl-1* has multi-biological functions.

Cysteine proteases in *C. elegans* are similar to cysteine proteases in other Eukaryotic organisms, so the results of this study may explain the function of *Cpl-1* in other eukaryotic organisms which have homologous and orthologous to *Cpl-1* in *C. elegans*.

Keywords: Cysteine proteases, embryogenesis, RNAi, *C. elegans*.