

Title: RPOA-2 Degron Induced Growth Arrest leads to Nutrient-Independent, Inter-Organismal, Body Length Increase in *C. Elegans*

Abstract: Stress-induced communication signals are widely studied in different species including zebrafish, bacteria, mice, etc. However, this phenomenon is not fully understood in *Caenorhabditis elegans*. Recently, a paper details the ability of irradiated worms using a cysteine protease to communicate stress signals to unirradiated worms using liquid co-inhabitation. Using a similar liquid co-inhabitation, this study investigates the influence of growth-arrested RPOA-2 degran strain *C. elegans* on non-growth-arrested *C. elegans*. Organism-wide growth arrest at the larval stage is induced by an auxin-induced degran-tagged RPOA-2, a ribosome polymerase I subunit, utilizing the F-box receptor TIR1. The growth arrested strain was co-inhabited with non-growth arrested wild-type worms. Also, a control TIR-1 strain non-growth arrested worms were raised in S Media previously inhabited by the growth-arrested strain. Data suggests that, regardless of nutrition, the body-length increase in the presence of the growth-arrested worms possibly through a secreted factor. Possible explanations for increase in body-length include change in lifespan, acceleration in development, and increased nucleolar/cell size. Further studies will include a lifespan study, airborne co-inhabitation study, and investigation into the possible soluble signal.

