Caenorhabditis elegans longevity when fed with *Bacillus subtilis* mutants

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ABSTRACT

Introduction:

Diet has a strong influence on aging and lifespan. Thus, understanding the mechanisms by which diet influences lifespan has implications for age-related and diet-related diseases. *Caenorhabditis elegans* is a powerful system to study the effects of diet on lifespan because it has a short life history, a simple anatomy and can be fed a variety of bacterial species and strains (1). In this project, we will use the nematode model *C. elegans* to uncover possible dietary factors that cause changes in the activation of diet-responsive genes. We will use a transgenic *C. elegans* strain that harbours a GFP promoter fusion to *acdh-1.* This transgenic dietary sensor strain, when submitted to diet restriction (a treatment that extends lifespan (2)) has a reduced GFP expression (3). We will use *Bacillus subtilis* large deletion mutants of non essential genes as a food source to screen for factors that change the GFP expression in the sensor strain. This project will indicate which kinds of factors in the diet are important for lifespan.

Methods:

-Generate a transgenic worm carrying two fluorescent constructs: P*acdh-1*::GFP to monitor diet sensing and Pdop-3::RFP to serve as standard for worm number normalization.

-Perform high-throughput screening of the fluorescent *C. elegans* strain with *B. subtillis* deletion mutants.

-If a significant variation of the diet sensor is found during the screening we will perform lifespan experiments to clarify if that diet affects the life history of the worm. If there is a noticeable change in lifespan a screen with single deletion mutants of that large deletion will be used to clarify which mutation is producing a change in life history.

Results:

-The fluorescent strain APS9 (*vsIs33 [dop-3*::RFP] ; *wwIs24* [P*acdh-1*::GFP + unc-119(+)]) was generated via sexual crossing of the strains VL749 x LX811. Heat shock treatment and RNAi of *him-14* were used to increase male ratio.

-We are currently screening the activity of P*acdh-1*::GFP when *C. elegans* is feed with single strains of the library of 250 *B. subitilis* mutants.

-Future milestones: lifespan experiments and single-deletion mutants screen.

Conclusions:

To be determined.

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