Neisseria oral taxon 14 enhances immunity in *C. elegans*

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Objective: Numerous health benefits have been attributed to commensal and probiotic bacteria in the digestive system. However, very few studies have focused on the role of commensal and probiotic bacteria in the oral cavity. Neisseria oral taxon 14 (NOT-14), a commensal bacterium of the oral cavity, is an understudied microorganism in context of human health and health benefits. The nematode *Caenorhabditis elegans* is an excellent model to decipher the roles of commensal and probiotic bacteria in aging, immunity, and oxidative stress. In this study, we determined if NOT-14 provides the worms enhanced immunity and prolonged lifespan.

Experimental Methods: To determine if the pretreatment of worms with NOT-14 enhances survival on the opportunistic pathogen *Streptococcus gordonii*, we exposed L4 larvae that was pretreated with NOT-14 and *E. coli* OP50 to *S. gordonii* and observed the survival of the worms. Longevity assays were performed to ascertain if worms exposed to NOT-14 lived longer in comparison to worms exposed to *E. coli* OP50. In addition, to determine if transgenic worms expressing *skn-1*-dependent gene *gst-4* fused to green fluorescent protein (GFP) were upregulated in response to NOT-14, we imaged NOT-14 and *E. coli* OP50 worms by epifluorescence microscopy.

Results: Significant increase in the survival of NOT-14 pretreated worms was observed on *S. gordonii* compared to *E. coli* OP50 exposed worms (p values < 0.05). However, there was no significant difference in the survival of the worms on NOT-14 compared to the *E. coli* OP50 (p values > 0.05). Finally, we observed that *gst-4: GFP* was significantly upregulated in response to NOT-14 compared to the worms exposed to *E. coli* OP50.

Conclusion: Our data shows that NOT-14 clearly protects the worms from the opportunistic pathogen *S. gordonii,* and this immune response is mediated by the transcription factor SKN-1.

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