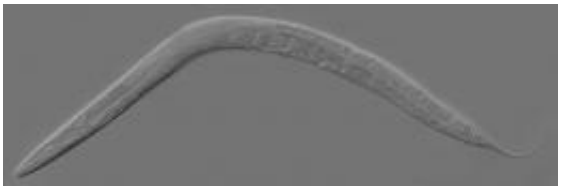
Worm research may help humans live longer

March 29 2013



Caenorhabditis elegans. Image: Wikipedia.

(Phys.org) —Look what might help us live longer—worms! Researchers at the Boyce Thompson Institute for Plant Research (BTI) and Cornell have shown that roundworms can live up to 20 percent longer when bathed in their own secretions.

The family of chemicals involved—ascarosides—also make these slippery, tiny worms more resistant to different types of stress.

Understanding this chemical model, which was published online in the *Proceedings of the National Academy of Sciences* March 18—might help humans live longer, say the researchers.

"It seems that the ascarosides trigger stress-resistance mechanisms that ultimately slow aging, a process that could lead to a better understanding of human aging and how it may be delayed," says senior author Frank Schroeder, assistant professor at BTI on the Cornell campus and in Cornell's Department of Chemistry and Chemical Biology. The first authors are postdoctoral scientist Andreas Ludewig and doctoral student

Yevgeniy Izrayelit.

The anti-aging effects of ascarosides depend on signaling pathways that are evolutionarily conserved. In other words, the researchers think that similar mechanisms of lifespan regulation may be at work in animals and humans, too. Ascaroside-promoted longevity appears to require a protein called sirtuin—a factor already known to be important for the biology of human aging and stress.

For humans, the chemical resveratrol found in red grapes and red wine has been suggested to increase lifespan through activation of the sirtuins. The worm-made ascarosides seem to increase lifespan by a similar mechanism, but they are roughly 1,000-times more effective than the grape-derived resveratrol.

Why use these worms, a type of nematode, to model human biology? Schroeder explains that human research on aging could take hundreds of years, while generation-cycles for nematodes—in this case C. elegans—takes but a few weeks. Discoveries from nematode research have already yielded important insight in several human diseases, most importantly diabetes, and Schroeder's work further emphasizes the relevance of nematodes for understanding longevity.

The study, "Pheromone sensing regulates Caenorhabditis elegans lifespan and stress resistance via the deacetylase SIR-2.1," was funded by the National Institutes of Health.

More information:
www.pnas.org/content/early/2013/03/13/1214467110

Provided by Cornell University