



Lowly worms lead the way

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McMaster University researchers are looking to an army of tiny worms to lead them to new treatments for Parkinson's disease.

In a highly unusual study, the Mac scientists will take advantage of the serendipitous fact that the tiny worms, called nematodes, and humans share genetic similarities in the brain's dopamine neurons that are affected by people with Parkinson's.

The project will use researchers from McMaster's faculties of engineering, sciences and health sciences and is being financed with a \$450,000 grant from the Collaborative Health Research Projects program of the National Science and Engineering Research Council and the Canadian Institutes of Health Research.

Bhagwati Gupta, a professor in the department of biology, says nematodes are frequently used in medical research, especially in cancer studies, but only now has a way been developed to effectively use them in Parkinson's studies.

Normally, the worms — barely visible to the human eye — are placed in a petri dish and their movements monitored when subjected to various stimuli. But Ravi Selvaganapathy, an associate engineering professor and expert in the design, fabrication and development of micro devices, came up with an ingenious micro channel device that restricts the movement of the worms. They can only wiggle forward or backwards, creating a more optimum circumstance for them to be observed and tested.

"What we found was their neurological development can be tracked by the speed by which they respond to an electric field," said Selvaganapathy.

"We have a way of telling the worm something to do and it does something in response," says Selvaganapathy. He says the electrical impulse works like a police officer telling a suspected drunken driver to walk a straight line. The officer decides on the neurological state of the person by the way he walks.

In the same way, the movement of the tiny worms is observed to see if they are moving normally or abnormally. Irregularly moving nematodes, which have been modified, can be given various drugs and chemicals to see how they respond.

Over the next few years, the McMaster researchers will test the effects of more than 500 compounds on nematodes. The research can be done much more quickly and less expensively with the tiny worms than with laboratory rats.



Microscopic image of worms. A microscopic image of the tiny worms being used by McMaster University researchers to study the effect of drugs on Parkinson's disease. Photo provided by McMaster University/Special to The Spectator Source: Special to The Spectator

Ram Mishra, a professor in the department of psychiatry and neuroscience who studies nervous system degeneration, says the study procedure is very simple but it can answer complicated questions. He hopes that someday, the findings can be used to develop drugs to help humans with Parkinson's.

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