



## Research Update • *Le point sur la recherche*

### Disk degeneration genetic?

Two University of Alberta researchers have uncovered evidence suggesting that degenerative disk disorders are more strongly linked to genetic factors than to environment.

Dr. Marie Crites Battié, chair of the Department of Physical Therapy, and Dr. Tapio Videman, a senior heritage scholar in the Faculty of Medicine, drew attention to their study results (*Spine* 1995;20:2601) last fall while applying for funds for follow-up research.

Their research so far concludes that environment and other factors associated with disk degeneration, such as smoking, alcohol consumption and physical stresses related to work and leisure activities, are not as significant in lower-back problems as once thought. Between them, the researchers have obtained 7 prestigious Volvo Awards for research on low-back pain.

Drawing on data compiled for the Finnish Twin Cohort Study, the investigators reviewed histories of identical twins with lower-back problems

whose occupations and lifestyles were markedly different. Even if one twin worked as a labourer and the other was employed in an office setting, both suffered almost identical disk problems, with the same level and type of degeneration.

"The similarities were uncanny," Battié says. Only male identical twins were studied because identical female twins with differing histories could not be found. Variation in the condition between twins is due to familial aggregation, a combination of genetic factors and shared activities during childhood. But so far the researchers do not know what proportion of degeneration is due to genetic factors and what proportion to environment. Battié suspects that disk degeneration is a genetic trait triggered by an environmental or physical stimulus.

"The study we are hoping to do over the next few years will look at nonidentical twins so we will be able to estimate better how much of the degeneration is influenced by genes and if there is interaction between the genetic and the environmental," she says. — *R. Cairney*

### Worming potential new drugs out of nematodes

Researchers in British Columbia are looking into potent substances produced by nematodes that may lead to antibiotic and antineoplastic drugs.

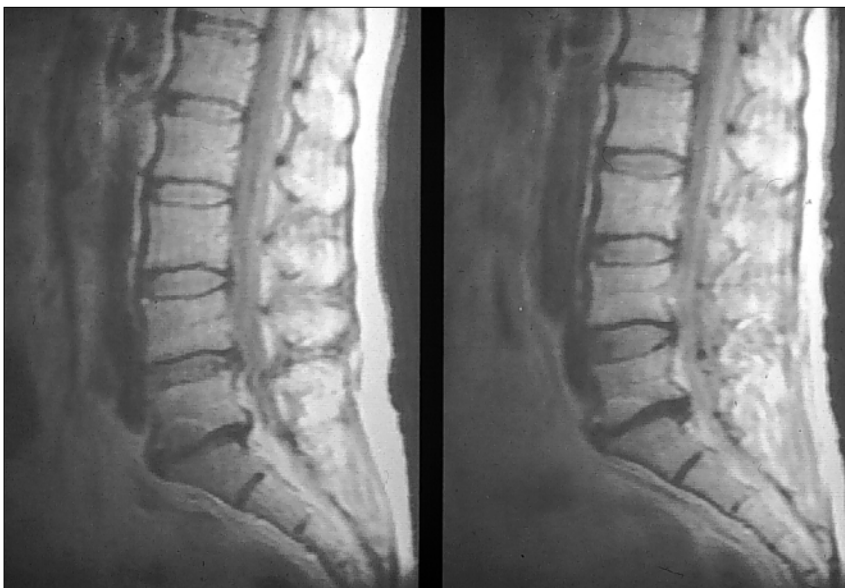
Drs. John Webster, Jianxiong Li and Genhui Chen of Simon Fraser University in Burnaby, BC, found that bacterial symbionts carried by microscopic nematodes (also known as roundworms) produce unusual chemical compounds that are effective against bacteria and cancer cells *in vitro*.

"These are new chemicals to science," says Webster, a professor in the Department of Biological Sciences, of the compounds he and his colleagues call "xenorxides." According to Li, their chemical composition is unlike any drug now available.

Certain nematodes are commonly used for agricultural pest control because of their ability to inject lethal bacteria into some insects. The bacteria, which belong to the *Xenorhabdus* genus, create metabolic products — xenorxides — whose function is uncertain. Environmental research into the effects of the trillions of bacteria entering the soil after the use of nematodes led to the discovery of several xenorxides.

Webster says *in-vitro* testing shows that the xenorxides are effective against drug-resistant *Staphylococcus* species and against certain cell lines (cancer cells). "These xenorxides are extremely effective in Petri-dish assays against a wide range of cancer cell lines and have a very low toxicity against normal human cells."

His team is working with the British Columbia Cancer Agency to test the effect of the compounds *in vivo*. The researchers have applied for patents; however, commercial applications are many years away. — *C.J. Brown*



Can you see the difference? MRI scans of the spines of identical twins — one a manual labourer, one an office worker — are almost identical.