



Multiple  
Sclerosis  
Society of  
Canada

Société  
canadienne  
de la sclérose  
en plaques



175 Bloor Street East  
Suite 700, North Tower  
Toronto, Ontario M4W 3R8  
Telephone: (416) 922-6065  
Fax: (416) 922-7538  
www.mssociety.ca

# Medical Update Memo

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## Pregnancy hormone key to repairing nerve cell damage

### SUMMARY

University of Calgary researchers have shown that a pregnancy-related hormone encourages the spontaneous rebuilding of myelin, the protective coating around nerve cells that is attacked in multiple sclerosis. The results of a two year study have been published in the February 21 edition of *The Journal of Neuroscience*.

The study was partially funded by the Multiple Sclerosis Society of Canada.

### DETAILS

In the February 21 issue of *The Journal of Neuroscience* (2007 27: 1812-1823), a team of researchers from the University of Calgary's Faculty of Medicine reports that a study conducted on mice found that the hormone prolactin encourages the spontaneous production of myelin, the fatty substance that coats nerve cells and plays a critical role in transmitting messages in the central nervous system. The study is the first to determine that prolactin, which increases in the body during pregnancy, is directly responsible for the formation of new myelin in the brains and spinal cords of pregnant mice. Further, when non-pregnant mice with MS-like lesions were injected with prolactin, their myelin was also repaired.

The study compared pregnant and virgin female mice of the same age and found that pregnant mice had twice as many myelin-producing cells, called oligodendrocytes, and continued to generate new ones during pregnancy. By chemically destroying myelin around nerve cells, the researchers found that pregnant mice had twice as much new myelin two weeks following the damage as virgin mice and that introducing prolactin mimicked the effects of pregnancy on myelin production and repair in mice that weren't pregnant.

The research was based on evidence that MS, which is more common in women than men, goes into remission when women become pregnant. “It is thought that during pregnancy, women’s immune systems no longer destroyed the myelin,” said Dr. Weiss, director of the Hotchkiss Brain Institute and senior author of the study.

“However, no previous study has tested whether pregnancy actually results in the production of new myelin, which may lead to improvement of symptoms.” The paper’s findings represent the first example of a natural, biological mechanism that produces new myelin in the adult brain and spinal cord and identifies prolactin as a potential therapeutic substance for future testing in people with MS.

Subsequent tests of prolactin in animal models of MS will be required before testing of prolactin on humans can take place, but MS researchers are hopeful human trials can take place within the next several years.

“This discovery has the potential to take MS therapy a step further than current treatments that stabilize the disease in its early stages. By promoting repair, which is the goal of prolactin therapy, we have hope of actually improving symptoms in people with MS,” says Dr. Luanne Metz, director of the Calgary MS Clinic in the Department of Clinical Neurosciences, University of Calgary and Calgary Health Region.

“The results of this study should be well received by people living with MS today,” said Dr. William McIlroy, national medical advisor for the Multiple Sclerosis Society of Canada. “It represents a new insight of how we might be able to reverse some of the effects of the disease and improve the quality of life for those who live under its influence.”

The study was funded by the Multiple Sclerosis Society of Canada and the Canadian Institutes of Health Research with the support of the Alberta Heritage Foundation for Medical Research and the Stem Cell Network.

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