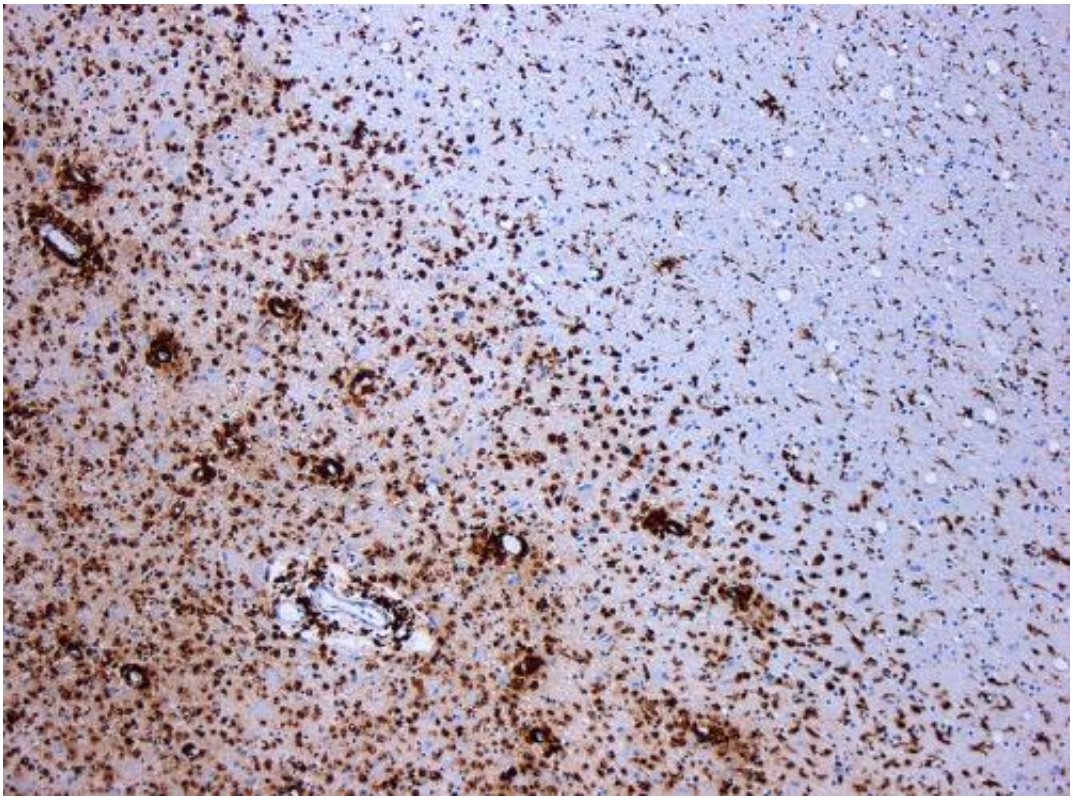
New drug target for multiple sclerosis discovered

February 17 2015



Demyelination by MS. The CD68 colored tissue shows several macrophages in the area of the lesion. Original scale 1:100. Credit: CC BY-SA 3.0 Marvin 101/Wikipedia

Scientists at the Centre for Addiction and Mental Health (CAMH) have discovered a promising new approach to treat multiple sclerosis (MS). In a new study, they've identified a previously unknown change in the

spinal cord related to MS, and a way to alter this change to reduce the nerve cell damage that occurs with the disease.

This research, which could lead to the development of new types of drugs to treat MS, was led by Dr. Fang Liu, Senior Scientist in CAMH's Campbell Family Mental Health Research Institute and Professor in the Department of Psychiatry, University of Toronto.

The study appears in the *Annals of Clinical and Translational Neurology*.

Multiple sclerosis (MS) is a progressive, often disabling neurological disease, which is most often diagnosed among young adults between the ages of 15 and 40. While the exact cause of MS is unknown, the body's immune response is involved, and is the target of all current medications used in treatment. These medications do not cure the illness, but they do help alleviate symptoms and slow the progression of the disease.

"We've identified a new biological target for MS therapy," says Dr. Liu. This approach aims to stop the nerve damage related to an important brain transmitter called glutamate.

The focus of her team's investigation was a spinal cord change that involved a protein, which attaches to a specific cell receptor for the glutamate neurotransmitter. This linked receptor-protein complex was present at higher levels in spinal cord tissues of deceased MS patients and in animal models for MS.

The potential for a new MS treatment is based on what Dr. Liu's team was able to show after this discovery. Using techniques developed in her lab, the researchers created a new peptide -a tiny piece of protein - to try and disrupt this change in animal models of MS.

"We found that our peptide disrupted this linkage, and led to major improvements in neurological functioning," says Dr. Liu. Specifically, motor function was significantly better compared to a comparison group. The peptide also had a positive impact on the nerve damage associated with MS - it reduced neuron death, and rescued the protective coating of neurons called myelin, which is characteristic of MS. It also increased the survival of the cells that produce myelin.

In MS, inflammation damages myelin in the central nervous system (CNS), which can harm the underlying nerves and interrupt the transmission of nerve impulses. MS is associated with a wide variety of symptoms, based on where the damage occurs in the CNS.

Importantly, the new peptide didn't appear to suppress the body's immune response system directly, and did not impair physiologically essential neuron transmission in the brain - a common side effect for drugs targeting the glutamate system, notes Dr. Liu. "Our priority now would be to extend this research and determine how this discovery can be translated into treatment for patients."

Provided by Centre for Addiction and Mental Health

Citation: New drug target for multiple sclerosis discovered (2015, February 17) retrieved 15 July 2023 from https://medicalxpress.com/news/2015-02-drug-multiple-sclerosis.html