

Nasal spray delivers new type of depression treatment

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A nasal spray that delivers a peptide to treat depression holds promise as a potential alternative therapeutic approach, research from the Centre for Addiction and Mental Health (CAMH) shows. The study, led by CAMH's Dr. Fang Liu, is published online in *Neuropsychopharmacology*.

In a previous study published in *Nature Medicine* in 2010, Dr. Liu developed a protein peptide that provided a highly targeted approach to treating [depression](#) that she hopes will have minimal side effects. The peptide was just as effective in relieving symptoms when compared to a conventional antidepressant in animal testing. However, the peptide had to be injected into the brain. Taken orally, it would not cross the blood-brain barrier in sufficient concentrations.

"Clinically, we needed to find a non-invasive, convenient method to deliver this peptide treatment," says Dr. Liu, Senior Scientist in the Campbell Family Mental Health Research Institute at CAMH. With the support of a Proof of Principle grant from the Canadian Institutes of Health Research (CIHR), Dr. Liu's team was able to further explore novel delivery methods.

The nasal delivery system, developed by U.S. company Impel NeuroPharma, was shown to deliver the peptide to the right part of the brain. It also relieved depression-like symptoms in animals.

"This study marks the first time a peptide treatment has been delivered through nasal passageways to treat depression," says Dr. Liu, Professor

in the University of Toronto's Department of Psychiatry.

The peptide treatment interferes with the binding of two dopamine receptors – the D1 and D2 receptor complex. Dr. Liu's team had found that this binding was higher in the brains of people with major depression. Disrupting the binding led to the anti-depressant effects.

The peptide is an entirely new approach to treating depression, which has previously relied on medications that primarily block serotonin or norepinephrine transporters.

Depression, the most common form of mental illness, is one of the leading causes of disability globally. More than 50 per cent of people living with depression do not respond to first-line medication treatment.

"This research brings us one step closer to clinical trials," says Dr. Liu. In ongoing lab research, her team is experimenting to determine if they can make the peptide break down more slowly, and travel more quickly in the brain, to improve its anti-depressant effects.

Provided by Centre for Addiction and Mental Health

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