

Innovative neuropeptide depression treatment to be developed

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The Centre for Addiction and Mental Health (CAMH) and Impel NeuroPharma have signed a licensing agreement to advance a new neuropeptide-based therapeutic approach shown to be effective in treating depression.

This novel treatment is a peptide that disrupts two dopamine receptors that bind at higher rates in the brains of people with major [depression](#). This approach represents a first-in-class therapeutic for depression and potentially other conditions.

CAMH's Dr. Fang Liu, Senior Scientist and Head of Molecular Neuroscience in the Campbell Family Mental Health Research Institute, identified this elevated coupling of the D1 and D2 receptors in people with depression, and created the new peptide treatment. Dr. Liu then found a way to administer the peptide using the Precision Olfactory Delivery (POD) nasal delivery device developed by Impel NeuroPharma.

First, Dr. Liu and her team had demonstrated that the peptide relieved symptoms of depression during preclinical testing and was as effective as a conventional antidepressant medication, as published in *Nature Medicine*. Targeting this D1 and D2 receptor complex is unique, as antidepressant medications primarily block serotonin or norepinephrine transporters. This approach can potentially alleviate depression while minimizing unwanted side effects.

Most recently, in partnership with Impel NeuroPharma, Dr. Liu and her

team found a way to administer the peptide using the POD nasal device in preclinical testing. When taken orally, the peptide does not cross the blood-brain barrier in sufficient concentrations. Using POD and delivering the peptide to the olfactory region of the nose resulted in transmission of the peptide to the correct target in the brain and relieved depression symptoms in preclinical testing. This research was supported by a Proof of Principle grant from the Canadian Institutes of Health Research (CIHR).

"This peptide is an entirely new approach to treating depression, and our work with Impel NeuroPharma has demonstrated a safe and effective way to provide this treatment in our research to date," says Dr. Liu.

CAMH's Industry Partnerships and Technology Transfer Office established the collaboration with Impel NeuroPharma to investigate Impel's nasal delivery system for Dr. Liu's discovery, as well as facilitated the negotiation of the new licensing agreement.

Impel NeuroPharma has licensed the peptide, and will continue research to explore the clinical development of this treatment, as part of its burgeoning portfolio of proprietary therapeutics to treat Central Nervous System conditions.

"We're excited that this licensing agreement brings us one step closer to clinical trials," says Dr. Liu.

John Hoekman, Chief Scientific Officer of Impel NeuroPharma commented: "The collaboration between CAMH and Impel NeuroPharma has produced valuable early data showing that this novel peptide can be non-invasively delivered to the brain with the POD technology. We are very excited to continue development of this molecule for depression and schizophrenia."

"Working with CAMH has been a very positive experience that we look forward to replicating with other researchers and institutions working on peptide and protein based drugs that do not cross the [blood-brain barrier](#) on their own. We believe that the POD technology can enable the development of such biologic therapeutics to address other debilitating diseases that currently lack effective, well-tolerated therapies."

Depression is one of the most common forms of mental illness, and according to the World Health Organization (WHO), it's the leading cause of disability worldwide based on total years lost due to disability.

The search for a new depression treatment is crucial, because many people with depression do not respond to current medications and other treatments. As well, conventional antidepressant medications can cause side effects. A key benefit of the new peptide treatment is that it results in fewer side effects.

CAMH has a portfolio of issued and pending U.S. patents for the peptide, and has applied for patent protection in Canada and Europe. As part of the current licensing deal, CAMH licensed its intellectual property rights related to the novel peptide to Impel NeuroPharma.

Provided by Centre for Addiction and Mental Health

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