

Neurological protein may hold the key to new treatments for depression

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Neuroscientists at the Centre for Addiction and Mental Health (CAMH) have developed a protein peptide that may be a novel type of highly targeted treatment for depression with a low side-effect profile. Depression affects one in ten Canadians at some time in their lives and is a leading cause of disability worldwide.

The study published in this month's [Nature Medicine](#) found that coupling between two [dopamine receptors](#) was significantly elevated in the brains of people who had been diagnosed with [major depression](#). "We identified a potential [therapeutic target](#) for development of novel anti-depressants." said Dr. Fang Liu, Principal Investigator and Senior Scientist in CAMH's Neuroscience Program and Associate Professor of Psychiatry at the University of Toronto. Working from this discovery, researchers sought to find a way to disrupt coupling between the two receptors in hopes that it would have an anti-depressant effect.

Using an autopsied brain study, Dr. Liu and her team initially found that coupling between two dopamine receptors was significantly elevated in the brains of people who had been diagnosed with major [depression](#). They started by analyzing a specific dopamine signaling mechanism, the D1 and D2 receptor complex, to identify the sites where the two receptors bind together. With this information, they were able to generate a protein peptide to disrupt the binding of the two receptors. The peptide was then tested in animal models to compare the effects with existing anti-depressant medications.

"After we administered the peptide, we saw a marked improvement in depression-related behaviors. The improvement seen in the peptide group was equivalent to the improvement on traditional anti-depressant medication".

This peptide is an entirely new approach to treating depression, which has previously relied on medications that primarily block serotonin or norepinephrine transporters. These conventional antidepressant medications don't work for all patients, and can cause various side effects. "We are hopeful that our research will lead to new options for treatment that might have reduced side effects for patients with depression," Dr Liu stated.

Provided by Centre for Addiction and Mental Health

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