

CAMH discovery identifies potential target for anti-craving medications

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Scientists at the Centre for Addiction and Mental Health (CAMH) have identified a potential target for the development of anti-craving medications for people with addictions to stimulants such as methamphetamine.

The discovery centres on a brain receptor related to the [chemical dopamine](#), which has a complex role in addictive behaviours.

Using brain scans and a novel [chemical probe](#) developed in CAMH's Research Imaging Centre, CAMH scientists found that the probe had high levels of binding to the dopamine D3 receptor in some people with methamphetamine addiction, compared with those who had no addiction. Higher levels of D3 were also linked to participants' reported motivation to take drugs.

"This is the first time, to our knowledge, that anyone has shown that D3 receptor levels are high in people with an active addiction to methamphetamine," says Dr. Isabelle Boileau, a scientist in the Research Imaging Centre, part of the new Campbell Family Research Institute at CAMH. Boileau led the study that appears in the January 25, 2012 issue of *The [Journal of Neuroscience](#)*.

Using [positron emission](#) tomography (PET), Boileau's team looked at D3 levels in 16 people who were dependent on methamphetamine. Participants abstained from [methamphetamine](#) use for 14 days prior to [brain scans](#). Their results were compared with scans from 16 participants

with no addiction. On a separate day after scanning, participants were given a low dose of amphetamine, and they had to report how much they wanted to use drugs.

D3 receptors appear to have a role in craving, but it is not fully established how they are related to drug-related behaviours. The new chemical probe developed at CAMH, called 11C-(+)-PHNO, binds to dopamine D3 receptors. This probe allows researchers to study D3 in people for the first time, using [PET scans](#), in order to answer questions about its role in stimulant addiction.

Understanding the role of [brain receptors](#) in addiction has enabled researchers to develop treatment medications, such as nicotine replacement therapy for smoking. So far, therapeutic strategies for stimulant [addiction](#) have focused on increasing activity with D2 receptors, where binding levels have been low.

"We can now suggest that any therapeutic approach aimed at increasing activity with D2 receptors should consider being selective at targeting D2, and not increasing D3 levels," says Boileau. "Our finding also supports the idea that D3 should be considered another target for anti-craving medications."

Boileau is also looking at the role of D3 in different types of addictions, including cocaine and gambling.

Building on CAMH's record of innovation and discovery, the Campbell Family Mental Health Research Institute will be accelerating discoveries in the areas of mood disorders, addictions, schizophrenia and cognitive impairment.

CAMH's Research Imaging Centre is the first of its kind in Canada where positron emission tomography (PET), magnetic resonance

imaging (MRI), and imaging-genetics are dedicated to the study of mental illness and addictions.

This new discovery is an example of the innovative brain science at CAMH's new Research Imaging Centre, the first of its kind in Canada where positron emission tomography (PET), magnetic resonance imaging (MRI), and genetic imaging are dedicated to the study of mental illness and addictions.

Provided by Centre for Addiction and Mental Health

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