

EXHIBIT J

Study shows marijuana increases brain cell growth

By Juanita King, The Muse
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ST. JOHN'S, Nfld · Supporters of marijuana may finally have an excuse to smoke weed every day. A recent study in the *Journal of Clinical Investigation* suggests that smoking pot can make the brain grow.

Though most drugs inhibit the growth of new brain cells, injections of a synthetic cannabinoid have had the opposite effect in mice in a study performed at the University of Saskatchewan. Research on how drugs affect the brain has been critical to addiction treatment, particularly research on the hippocampus.

The hippocampus is an area of the brain essential to memory formation. It is unusual because it grows new neurons over a person's lifetime. Researchers believe these new cells help to improve memory and fight depression and mood disorders.

Many drugs—heroin, cocaine, and the more common alcohol and nicotine—inhibit the growth of these new cells. It was thought that marijuana did the same thing, but this new research suggests otherwise.

Neuropsychiatrist Xia Zhang and a team of researchers study how marijuana-like drugs—known collectively as cannabinoids—act on the brain.

The team tested the effects of HU-210, a potent synthetic cannabinoid similar to a group of compounds found in marijuana. The synthetic version is about 100 times as powerful as THC, the high-inducing compound loved by recreational users.

The researchers found that rats treated with HU-210 on a regular basis showed neurogenesis—the growth of new brain cells in the hippocampus. A current hypothesis suggests depression may be triggered when the hippocampus grows insufficient

numbers of new brain cells. If true, HU-210 could offer a treatment for such mood disorders by stimulating this growth.

Whether this is true for all cannabinoids remains unclear, as HU-210 is only one of many and the HU-210 in the study is highly purified.

“That does not mean that general use in healthy people is beneficial,” said Memorial psychology professor William McKim. “We need to learn if this happens in humans, whether this is useful in healthy people, and whether THC causes it as well.”

McKim warns that marijuana disrupts memory and cognition. “These effects can be long-lasting after heavy use,”* he said. “This makes it difficult to succeed academically if you use it excessively.”**

“This is good for treatment of soldiers with Post Traumatic Stress Disorder (PTSD)”—Dr. Phillip Leveque

***Kids with ADD/ADHD and other mental disorders, may benefit greatly from using cannabis.* —Dr. Claudia Jensen and Dr. Tod Mikuriya

“Occasional light use probably does not have very serious consequences. [But] there is some evidence that marijuana smoke might cause cancer.” [Note from Jack: In 22 years (1985-2007) of marijuana research, it has never been linked to cancer.]

Still, the positive aspects of marijuana are becoming more plentiful as further research is done. McKim says it's not surprising that THC and compounds like it could have medicinal effects.

“Many have been identified,” he said. “It stimulates appetite in people with AIDS, it is an analgesic, and blocks nausea in cancer patients undergoing chemotherapy. And it treats the symptoms of glaucoma.”

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