Featured Research *from universities, journals, and other organizations*

Marijuana-Like Compounds May Aid Array Of Debiliatiing Conditions Ranging From Parkinson's Disease To Pain

Date: October 27, 2004

Source: Society For Neuroscience

Summary: No longer a pipe dream, new animal research now indicates that marijuana-like compounds can aid a bevy of debilitating conditions, ranging from brain disorders such as amyotrophic lateral sclerosis (ALS) and Parkinson's disease, to pain and obesity.

Share This
› Email to a friend
› Facebook
› Twitter
› LinkedIn
› Google+
› Print this page

Related Topics
Health & Medicine
› Controlled Substances
› Chronic Illness
› Diseases and Conditions
Mind & Brain
› Marijuana
› Illegal Drugs
› Brain Injury

No longer a pipe dream, new animal research now indicates that marijuana-like compounds can aid a bevy of debilitating conditions, ranging from brain disorders such as amyotrophic lateral sclerosis (ALS) and Parkinson's disease, to pain and obesity.

In past studies, researchers determined that the main active chemicals in the drug marijuana produce a variety of effects by connecting to specific sites on nerve cells, called cannabinoid receptors. Researchers also discovered that these receptors normally bind to natural internal chemicals, dubbed cannabinoids.

Related Articles
› Excitotoxicity and cell damage
› Multiple sclerosis
› Neurology
› Biological psychiatry
› Parkinson's disease
› Chronic pain

"Understanding how marijuana and the brain's own natural cannabinoid system works is helping researchers design new medicines," says cannabinoid expert Daniele Piomelli, PhD, of the University of California in Irvine. "It's believed that the controlled therapies that come out of this research might provide select benefits to patients while avoiding some of the unwanted effects seen with the drug."

Research from California Pacific Medical Center in San Francisco points to the promise of marijuana-like treatments for those with the fatal brain disorder ALS, also known as Lou Gehrig's disease.

"Our research indicates that select marijuana compounds, including THC, significantly slow the disease process and extend the life of mice with ALS," says study author Mary Abood, PhD.

The study extends earlier work from Abood's group that found that THC also can alleviate some ALS symptoms, like muscle spasms, in patients.

ALS wreaks its havoc by harming nerve cells that control muscles. As a consequence of the damage, an estimated 5,000 Americans afflicted annually experience progressive muscle weakness that can hinder movement, speech, even swallowing and breathing. New treatments for ALS are desperately needed.

"The only FDA approved drug for ALS, riluzole, extends life on average by about two months," says Abood. "Evidence from our study suggests that a marijuana-based therapy could create a much greater effect, perhaps extending life by three years or more."

In the study, ALS mouse models were given either the marijuana compound THC, the marijuana compound cannabidiol, cannabidiol plus THC, or a placebo daily following the onset of disease signs. The researchers measured disease progression by testing how long the mice could stand on a slowly rotating rod. The more severe their nerve cell degeneration, the less time the mice can balance on the rod. In addition, two conditions of ALS, the loss of movement ability and survival time, were analyzed using a mathematical model.

"We found that treatment with THC delayed disease progression by seven days and extended survival by six days in the mouse model," says Abood. "This corresponds to three years in human terms."

Results also indicate that the combination of THC and cannabidiol further delays disease progression. Treatment with cannabidiol alone, however, had no effect.

Another part of the study determined that the marijuana compounds create their benefits by reducing two molecular processes, known as oxidative stress and

Breaking News:
Atom-Thick CCD Could Capture Images

Related Stories

Over-Activity of Enzyme HDAC6 Exacerbates Symptoms of Amyotrophic Lateral Sclerosis
June 26, 2014 — Scientists have demonstrated in fruit-flies that over-activity of the enzyme HDAC6 in the nerve ends exacerbates the symptoms of the neurodegenerative condition Amyotrophic Lateral Sclerosis (ALS / ... › *full story*

Medical Marijuana in Treatment of Certain Brain Diseases: Experts Weigh in
Apr. 28, 2014 — A review of available scientific research on the use of medical marijuana in brain diseases finds certain forms of medical marijuana can help treat some symptoms of multiple sclerosis (MS), but do ... › *full story*

Medical Marijuana Not the Answer for Teens With Chronic Pain, Doctors Say
June 17, 2013 — Adolescents can have chronic pain, just like adults. As patients, their parents and physicians search for solutions, there is one increasingly available option they should avoid, researchers say: ... › *full story*

Marijuana Component Could Ease Pain from Chemotherapy Drugs, Study Suggests
Oct. 6, 2011 — A chemical component of the marijuana plant could prevent the onset of pain associated with drugs used in chemotherapy, particularly in breast cancer ... › *full story*

Marijuana Use May Hurt Intellectual Skills in Multiple Sclerosis Patients
Mar. 28, 2011 — Any possible pain relief that marijuana has for people with multiple sclerosis may be outweighed by the drug's apparent negative effect on thinking skills, according to new ... › *full story*

› *more related stories*

glutamate excitotoxicity. These processes have been implicated in ALS and are thought to harm nerve cells.

As a next step, the researchers will further decipher the mechanisms of action of THC and cannabidiol.

Another animal study also indicates that a marijuana-like compound can protect brain cells from the damage produced by the disorder Parkinson's disease.

“For the first time, our research shows the neuroprotective value of marijuana-like compounds in a well-established animal model of Parkinson's disease,” says study author Andrea Giuffrida, PhD, of the University of Texas Health Science Center in San Antonio.

Parkinson's afflicts some 1 million Americans. Symptoms include slowness of movement, muscle stiffness, and shaky tremors, which can harm a person's ability to walk, talk, write, and eat. This havoc results from the death or injury of brain cells that produce the chemical dopamine.

“There are therapies that can help replenish depleted levels of dopamine and provide symptomatic relief, but none can reverse, prevent, or delay the progression of Parkinson's disease,” says Giuffrida. “Our research shows that marijuana-like compounds may be able to answer this need.”

In the study, researchers examined whether a marijuana-like compound designed to activate cannabinoid receptors, WIN 55212-2, could protect brain cells from degenerating in a Parkinson's mouse model, known as MPTP-treated mouse. These animals are given an injection of the toxin MPTP, which kills dopamine brain cells and induces symptoms seen in Parkinson's disease. The mice received a single injection of WIN 55212-2 30 minutes before the MPTP injection.

“We found that the brains of mice treated with the marijuana-like compound were almost indistinguishable from the brains of healthy mice,” says Giuffrida.

As a next step, the researchers are testing whether the marijuana-like compounds have neuroprotective value when brain cell damage is already present and whether they can prevent the progression of brain cell loss. “Learning more about the mechanisms by which marijuana-like compounds may slow down or prevent neurodegeneration in Parkinson's disease may translate into new pharmacological treatments that could fight this disorder in its earliest stages,” adds Giuffrida.

Another new animal study finds that drugs often prescribed for mild pain, like the pain from a tooth extraction, create greater pain relief when combined with a marijuana-like compound. If confirmed in humans, the combination strategy could be a boon to those with persistent pain conditions.

Persistent pain is notoriously difficult to treat. An estimated 50 million Americans endure some type of persistent pain that lasts for months, even years, including back pain, headaches, arthritis pain, and cancer pain.

“We found that the combination of a marijuana-like compound with either the mild pain medication ibuprofen or rofecoxib provides more pain relief than each of them given alone,” says study author Pierre Beaulieu, MD, PhD, of the University of Montreal in Canada .

The marijuana-like compound that researchers tested in the study is called anandamide, a natural internal chemical that activates the same system as marijuana. Nonsteroidal anti-inflammatory drugs such as ibuprofen and rofecoxib inhibit a specific enzyme that prevents the degradation of anandamide. This led researchers to suspect that supplements of anandamide could create even greater pain relief effects.

In the study, researchers injected the drugs into the back paw of rats. Then 15 minutes later, researchers injected the compound formalin into the same paw, which creates a persistent inflammatory pain condition locally.

“We found that compared to a separate administration of drugs, anandamide combined with either ibuprofen or rofecoxib doubled the animals' pain relief,” says Beaulieu. “Also since the compounds were injected locally, into the paw, we believe that the treatment would avoid some of the deleterious psychoactive effects seen with marijuana.”

Marijuana and marijuana-like compounds can act on receptors in the brain and the periphery, but only the brain ones contribute to the psychoactive effects.

As a next step, the researchers are testing the treatment strategy in animals that model a particularly hard-to-treat, persistent pain condition that can result from nerve injury, termed neuropathic pain.

Another new animal study supports the development of treatments that target the cannabinoid system for those with obesity. “We found that a compound that blocks activity in the cannabinoid system can significantly reduce food intake in animals by triggering activity in another system that is known to regulate appetite and body weight,” says study author Michael Cowley, PhD, of Oregon Health and Science University.

Obesity has risen at an epidemic rate during the past 20 years, according to the Centers for Disease Control and Prevention. More than 60 percent of adult Americans are overweight or obese. These people face an increased risk for a range of physical ailments, including high blood pressure, diabetes, and stroke.

“For many years anecdotal reports have described how marijuana use can increase appetite,” says Cowley. “Some users describe these cravings as the munchies.”

This and other work has prompted the development of drugs that combat appetite by blocking the cannabinoid receptors, which are activated by marijuana. “Some of these drugs are in late stage clinical trials,” says Cowley. “How they are able to control

Strange & Offbeat Stories

Health & Medicine

- Lost Memories Might Be Able to Be Restored, Suggests Research Into Marine Snail
- Weigh-in Once a Week or You'll Gain Weight
- Thumbs-Up for Mind-Controlled Robotic Arm
- When You Lose Weight, Where Does the Fat Go? Most of the Mass Is Breathed out as Carbon Dioxide, Study Shows
- Dental Plaque Reveals Key Plant in Prehistoric Easter Island Diet

Mind & Brain

- Lost Memories Might Be Able to Be Restored, Suggests Research Into Marine Snail
- In One Aspect of Vision, Computers Catch Up to Primate Brain
- No 'Bird Brains'? Crows Exhibit Advanced Relational Thinking, Study Suggests
- Bugs Life: The Nerve Cells That Make Locusts ‘gang Up’
- Kids' Cartoon Characters Twice as Likely to Die as Counterparts in Films for Adults: Content on a Par With 'Rampant Horrors' of Popular Films

Living & Well

- Sharing That Crowded Holiday Flight With Countless Hitchhiking Dust Mites
- Is This the End of 'Fake Exemptions? ' It Is Possible to Detect When We Provide False Information Regarding Our Health Conditions Through Handwriting
- Dogs Hear Our Words and How We Say Them
- Pleasure at Another's Misfortune Is Evident in Children as Young as Two
- Finding 'Lost' Languages in the Brain: Far-Reaching Implications for Unconscious Role of Infant Experiences

In Other News

... from NewsDaily.com

Science News

- Europe recommends approval for first stem-cell therapy
- Disgraced Japan researcher fails to replicate 'game changing' stem cell results
- Songbirds fly coop long before tornadoes arrive in Tennessee
- SpaceX delays planned cargo run to space station to early January
- India tests its heaviest space launch vehicle, eyes global market

Health News

- Ebola response in rural Sierra Leone not yet rapid enough
- Britain lifts bird flu restrictions on duck farm
- South Korea halts U.S. poultry imports due to bird flu in U.S.
- U.N.'s Ebola mission should be closed once battle won: Ban

eating, however, has been a mystery."

To shed some light on how they might work, Cowley and his colleagues gave mice a cannabinoid receptor blocker, termed AM251. "We found that the treated animals significantly reduced their food intake, as has been known for many years," says Cowley. "We also found evidence that the activity of brain cells involved in the melanocortin system, which is known to control food intake and energy balance, increased."

Several molecular measures signaled that there was increased activity in melanocortin brain cells. Included was the discovery that in treated animals there was a fourfold increase in the number of melanocortin brain cells that contained c-fos, a marker of cellular activation.

"These data show that cannabinoid receptor blockers can regulate the melanocortin pathways in animals and support the further development of cannabinoid blockers to help combat obesity in humans," says Cowley.

Story Source:

The above story is based on materials provided by **Society For Neuroscience**. *Note: Materials may be edited for content and length.*

Cite This Page:

MLA **APA** **Chicago**

Society For Neuroscience. "Marijuana-Like Compounds May Aid Array Of Debiliatiing Conditions Ranging From Parkinson's Disease To Pain." ScienceDaily. ScienceDaily, 27 October 2004. <www.sciencedaily.com/releases/2004/10/041027102621.htm>.

Share This

- Email to a friend
- Facebook
- Twitter
- LinkedIn
- Google+
- Print this page

- Child tests negative for Ebola at Chicago hospital

Environment News

- 10 years on, tsunami warning stumbles at the "last mile"
- U.S. judge restores protections to Great Lakes wolves
- Coal ash is not hazardous waste under U.S. agency rules
- Ecuador halts environment deals with Germany over rainforest visit
- Obama: Keystone benefits for U.S. consumers, workers nominal

Technology News

- Obama says Sony hack not an act of war
- U.S. firm finds malware targeting visitors to Afghan government websites
- U.S. judge rejects HP settlement in Autonomy shareholder case
- Washington is limited in its response to North Korea over Sony hack
- Bitcoin backer gets two years prison for illicit transfers

Save/Print: **Share:**

More From ScienceDaily

When you lose weight, where does the fat go ...

Gut microbiota and Parkinson's disease ...

Life expectancy increases globally as death ...

Feeling younger than actual age meant lower ...

Infertility is a warning: Poor semen quality ...

People's genes may influence 'gut' bacteria ...

Bacterial biofilms are associated with colon ...

Prenatal exposure to common household ...

More Mind & Brain News

Sunday, December 21, 2014

Featured Research

from universities, journals, and other organizations

Lost Memories Might Be Able to Be Restored, Suggests Research Into Marine Snail

Dec. 20, 2014 — New research indicates that lost memories can be restored, according to new research into a type of marine snail called Aplysia. The findings offer some hope for patients in the early stages of ... › *full story*

- Restoring Lost Memories: Marine Snail Insights
- Effects of Early Exposure to Antidepressants
- Family Criticizing Your Weight Might Add Pounds
- The Dementia That Is Not Alzheimer's Disease
- Gene Critical for Brain Development Discovered
- Brain Mechanisms Predict Generosity in Children
- OCD : How Compulsive Habits Develop
- Being Humble: E.B. White Was Right