

Featured Research

from universities, journals, and other organizations

Save/Print: Share:

Mechanism of action of two new synthetic drugs unravelled for the first time

Date: April 22, 2015

Source: Medical University of Vienna

Summary: Substances such as 4-MEC and 4-MEPP belong to the category of new hybrid cathinone derivatives and have a highly stimulant and euphoria-inducing effect, similar to the synthetic drug mephedrone, which was banned in Austria five years ago. Until now, the mechanisms by which these two drugs worked have been unknown. Scientists have now been able, through an international cooperation agreement, to unravel this mechanism for the first time.

Share This

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

Related Topics

Health & Medicine

- Controlled Substances
- Pharmacology
- Pharmaceuticals
- Health Policy
- Diseases and Conditions
- Psychology Research

Substances such as 4-MEC and 4-MEPP belong to the category of new hybrid cathinone derivatives and have a highly stimulant and euphoria-inducing effect, similar to the synthetic drug mephedrone, which was banned in Austria five years ago. Until now, the mechanisms by which these two drugs worked have been unknown. Scientists at the MedUni Vienna have now been able, through an international cooperation agreement, to unravel this mechanism for the first time.

The two drugs 4-MEC and 4-MEPP, which are primarily taken via the nasal and oral route, belong to the group of amphetamines in the second generation of chemically modified cathinone derivatives. The basic cathinone structure occurs naturally in the "khat" plant, which is mostly grown on plantations and consumed in the Horn of Africa, Somalia and the Yemen. Cathinone has central stimulating, euphoria-inducing and psychotropic properties. Khat itself, taken on its own, has only a slightly intoxicating effect, similar to that of a glass or two of beer.

Researchers led by primary author Kusumika Saha from the Institute of Pharmacology at the MedUni Vienna have now been able to demonstrate that 4-MEC (4-Methyl-N-Ethylcathinone) works in two ways, depending on which neurotransmitter transporter it binds to in the brain. "If the substance docks to the serotonin transporter, it acts like amphetamine. If it docks to the dopamine transporter, however, it acts like cocaine," explains Harald Sitte from the Institute of Pharmacology at the MedUni Vienna. It is therefore currently difficult to assess what effect it will have on the consumer, or which effect characteristic will prevail.

In the case of 4-MEPP (4-Methyl-a-pyrrolidinopropiophenone), it was discovered that it acts like a blocker similar to cocaine on dopamine as well as serotonin transporters, comparable with the "zombie drug" MDPV (3,4-Methylenedioxypropylvalerone), which can cause tremendous loss of control and aggression if taken.

International paper with a high-calibre audience

The cover of the journal *Neuropsychopharmacology* was dedicated to the paper, and the work carried out in close collaboration with the National Institute of Drug Abuse (NIDA) in Baltimore (USA), was also featured by the "Faculty of 1000," giving it a high-calibre international audience too. The "Faculty of 1000" is a review database listing more than 3,500 specialist magazines from the field of medicine and biology.

Story Source:

The above story is based on materials provided by [Medical University of Vienna](#). Note: Materials may be edited for content and length.

Journal Reference:

Breaking News:

[Mosquitoes Really Do Pick Favorites](#)

70%
of traditional addiction treatments fail.
We offer a better way.

enterhealth | **1.800.388.4601**
LEARN MORE

Related Stories

Recreational Drug Users Who Switch from Ecstasy to Mephedrone Don't Understand Dangers

Mar. 25, 2014 — Contrary to popular belief among recreational drug users, mephedrone has several important differences when compared with MDMA, commonly known as ecstasy. These differences mean that mephedrone could ... [full story](#)

'Bath Salts' Stimulant Could Be More Addictive Than Meth, Study Shows

July 10, 2013 — Scientists have published one of the first laboratory studies of MDPV, an emerging recreational drug that has been sold as "bath salts." The researchers confirmed the drug's powerful ... [full story](#)

Drug Study Shows Clubbers Have Little Interest in New Wave Legal Highs

June 21, 2012 — Clubbers show little interest in the subsequent wave of legal highs that have become available since mephedrone was banned, according to a new ... [full story](#)

New Tests for Dangerous 'Legal Marijuana,' 'Bath Salts' and Other Emerging Designer Drugs

Aug. 30, 2011 — Scientists report the development of much needed new tests to help cope with a wave of deaths, emergency room visits and other problems from a new genre of dangerous designer drugs sold legally in ... [full story](#)

Many Mephedrone Alternatives Just as Risky, Warn Experts

July 6, 2010 — Since the recent ban on mephedrone, many so-called "legal substitutes" available on the internet are in fact banned cathinones (chemically related to amphetamines) and just as risky, warn ... [full story](#)

[more related stories](#)

Our single mission for more than 70 years: Making Cancer History®

Give Now

THE UNIVERSITY OF TEXAS
MDAnderson
Cancer Center
Making Cancer History®

1. Kusumika Saha, John S Partilla, Kurt R Lehner, Amir Seddik, Thomas Stockner, Marion Holy, Walter Sandtner, Gerhard F Ecker, Harald H Sitte, Michael H Baumann. 'Second-Generation' Mephedrone Analogs, 4-MEC and 4-MePPP, Differentially Affect Monoamine Transporter Function. *Neuropsychopharmacology*, 2014; 40 (6): 1321 DOI: 10.1038/npp.2014.325

Cite This Page:

MLA APA Chicago

Medical University of Vienna. "Mechanism of action of two new synthetic drugs unravelled for the first time." ScienceDaily. ScienceDaily, 22 April 2015. <www.sciencedaily.com/releases/2015/04/150422084226.htm>.

Share This

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

Do You Have Cancer?

Money Available to Persons Exposed To Radiation From Nuclear Testing



Strange & Offbeat Stories

Health & Medicine

- Autism and Prodigy Share a Common Genetic Link
- Scientists Watch Living Taste Cells in Action
- New Super-Fast MRI Technique Demonstrated With Song 'If I Only Had a Brain'
- Listen to Your Heart: Why Your Brain May Give Away How Well You Know Yourself
- Insects Inspire Next Generation of Hearing Aids

Mind & Brain

- Autism and Prodigy Share a Common Genetic Link
- Scientists Watch Living Taste Cells in Action
- Brain Activity Tested to Identify Cybersecurity Threats
- Technology Can Transfer Human Emotions to Your Palm Through Air, Say Scientists
- Social Shaming and the Search for Validation

Living & Well

- Genes Make Some People Mosquito Targets, Twins Pilot Study Shows
- Ten More Years of Real Money?
- Watch Where You're Going: New Study Reveals How People Avoid Bumping Into Each Other
- A Sniff of Happiness: Chemicals in Sweat May Convey Positive Emotion
- Video Games Can Power Up from Merely Fun to Meaningful Experiences

More From ScienceDaily

Powered by Google



sciencedaily.com

Cannabis: Potent Anti-depressant In Low Doses, Worsens



sciencedaily.com

Why Cannabis Stems Inflammation



sciencedaily.com

Marijuana's long-term effects on the brain demonstrated



sciencedaily.com

Marijuana compound may offer treatment for Alzheimer's disease



sciencedaily.c

Cannabis e can have d effect on b cancer, say

NEXT

More Health & Medicine News

Thursday, April 23, 2015

Featured Research

from universities, journals, and other organizations

Proposed Breast Cancer Screening Guidelines Would Increase Deaths, Experts Say

Apr. 22, 2015 — The breast cancer screening guidelines proposed yesterday by the United States Preventive Services Task Force (USPSTF) would result in thousands of additional and unnecessary breast cancer deaths ... [full story](#)

Breast Cancer; Women's Health; Cancer; Teen Health

- Proposed Breast Cancer Screening: More Deaths?
- Sugary Drinks Boost Heart Disease Risk
- Missing Genetic Link Found in Immune Disease
- Complex Wounds: Good, Cost-Effective Treatments
- New Ebola Treatment Works 3 Days After Infection
- Toxic Mushroom-Based Drug for Colorectal Cancer
- Caloric Restriction: Muscles' Fountain of Youth?
- Detecting Common Bacteria Contaminating Oysters
- Drug Reverses Parkinson's-Like Symptoms
- X-Raying Anti-Inflammatory Drug Candidates

newer top stories | older top stories

Featured Videos

from AP, Reuters, AFP, and other news services

In Other News

... from NewsDaily.com

Science News

- 'Safest bike ever' devised by British entrepreneur
- How do you tell a boy dinosaur from a girl dinosaur?
- Morphing wings allow drones to keep flying through midair collisions
- Russia cuts space funding as economic crisis bites
- Bullet-proof Bloodhound car aims for 1,000mph record

Health News

- Drugmaker AbbVie's profit beats estimates on strong Humira sales
- FDA grants priority review to Boehringer's blood clotting agent
- Hyperemesis gravidarum tied to children's neurological problems
- Utah lawmaker invokes Mormon prophet



Conjoined Twins in Peru to Be Separated



Millions of Hens Euthanized in Midwest Bird Flu Outbreak



New Study Finds No Link Between Measles Vaccination, Autism



Breathing Easier in Big Easy After Smoking Ban

grandpa in medical pot plea

- California bill ending 'beliefs' exemption for childhood vaccines advances

Environment News

- Volcano Calbuco still erupting in Chile, some flights canceled
- Chinese banks must cut coal lending, shift to cleaner businesses: study
- Australia urged to explain funding for climate contrarian
- In Florida's Everglades, Obama wades into climate change politics
- Haitian marine biologist wins environmental activism prize

Technology News

- Nasdaq sets aside \$31 million for ongoing Facebook IPO claims
- Rise of e-commerce poses safety concern for China's air transport: IATA
- Logitech moves away from computer mouse, looks to wireless
- Facebook revenue growth slows, costs weigh on profit
- EU court upholds LCD panel cartel fine for LG Display

Search ScienceDaily

Number of stories in archives: 140,361

Find with keyword(s):

Enter a keyword or phrase to search ScienceDaily for related topics and research stories.

Save/Print: Share:

Free Subscriptions

Get the latest science news with ScienceDaily's free email newsletters, updated daily and weekly. Or view hourly updated newsfeeds in your RSS reader:

- Email Newsletters
- RSS Feeds

Get Social & Mobile

Keep up to date with the latest news from ScienceDaily via social networks and mobile apps:

- Facebook
- Twitter
- Google+
- iPhone
- Android
- Web

Have Feedback?

Tell us what you think of ScienceDaily -- we welcome both positive and negative comments. Have any problems using the site? Questions?

- Leave Feedback
- Contact Us