Party drug's brain tricks explained for first time

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(Medical Xpress) -- A researcher at the University of Sydney has discovered how the increasingly common street drug mephedrone affects the brain, helping to explain why it is potentially such an addictive substance.

A party drug also known by the street name 'meow meow', mephedrone works like a combination of methamphetamine (crystal meth or ice) and MDMA (commonly known as ecstasy), explains PhD student Craig Motbey.

He used an advanced technique to trace the effect of mephedrone on brain neurons. "When you look at the pattern of neurons activated by the mephedrone, it is as if the effect of ecstasy and the effect of methamphetamine on the brain's neurons had been laid on top of each other," he said.

"The findings confirm the anecdotal reports from mephedrone users that the drug combines the euphoric, sociable effects of ecstasy with an addictive hook comparable to drugs such as cocaine or methamphetamine."

The research, which has been published online in the journal *Addiction Biology* ahead of print publication, uses a technique called c-Fos, which tracks proteins in the brain that indicate which neurons were activated by mephedrone consumption.

The brains of rats which were dosed with mephedrone were compared to those that weren't, allowing researchers to detect which neurons were reacting to the drug.

"Mephedrone is similar to ecstasy but with a strong addictive component. Rats really like this drug, they'll spend hours working to get it," Motbey said.

Mephedrone is a relatively new recreational drug that has been available in Australia for approximately two years. It is already in widespread use in the UK and Europe, and is one of the so-called designer drugs created to circumvent bans on existing drugs.

Motbey's supervisor and co-author of the paper, Professor Iain McGregor, will lead a project that has just received $386,250 from the National Health and Medical Research Council to study mephedrone's effects on the brain in more detail, including the long term damage to users.

The work will be done in conjunction with Dr. Adam Winstock at the UK National Addiction Centre, London, a leading authority on mephedrone.

"Mephedrone is one of the new breed of party drugs that are exploding in popularity around the world," said Professor McGregor, head of the University of Sydney's Psychopharmacology Laboratory.

"The evolution of party drugs is very rapid at present, and the chemistry behind them is often clever and devious. Scientists and health authorities must move urgently to define the psychological and physical dangers these drugs pose to young people."

Provided by University of Sydney