

Legal high Benzo Fury may be dangerous due to stimulant and hallucinogenic effects

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The 'legal high' known as Benzo Fury may have stimulant as well as hallucinogenic effects according to new research presented at the British Neuroscience Association Festival of Neuroscience today (Tuesday 9 April 2013).

In a poster presentation at the meeting, Dr Jolanta Opacka-Juffry and Dr Colin Davidson reported that one of the main ingredients of Benzo Fury (also known as 5-APB) acts on [brain tissue](#) like both a stimulant and a hallucinogen – a combination of properties that is often found in illegal drugs and which can make them dangerous to users. The researchers believe this information should be disseminated to let potential users know the possible dangers of the [drug](#).

Dr Opacka-Juffry, who is a principal lecturer in neuroscience and director of the health sciences research centre at the University of Roehampton, and Dr Davidson, senior lecturer in neuropharmacology and expert in drugs of addiction at St George's, University of London, studied the effect of 5-APB samples from the brains of rats. In particular, they looked at the effect it had on serotonin receptors, which are affected by [hallucinogenic drugs](#), and on a protein called the dopamine transporter (DAT), which pumps a neurotransmitter, dopamine, back in to [nerve cells](#), terminating its activity, and which is involved in addiction. They compared the effects of 5-APB with those caused by cocaine and amphetamine.

"We have found that 5-APB behaves a little like amphetamine – that is, like a stimulant with addictive potential – and a bit like a hallucinogen, acting via serotonin receptors. This kind of mixed properties can be found in some illegal 'designer' drugs," the presenting author, Dr Opacka-Juffry said.

"This finding is significant because it demonstrates that some 'legal highs' may have [addictive properties](#), which are unlikely to be well-known amongst the users of these drugs. In addition, its effects on the serotonin receptors – known as 5-HT_{2A} receptors – would suggest that it may lead to high blood pressure by causing constriction of the blood vessels, which would make the drug more dangerous. It is possible that the reason these drugs are so popular is because they are seen as safer than their illegal counterparts. It is important to challenge these assumptions."

The researchers also found that 5-APB caused "reverse transport of dopamine".

Dr Davidson said: "In theory, drugs which cause reverse transport could cause damage to the dopamine nerve cells. Other drugs such as

amphetamines can also cause reverse transport, where dopamine is displaced from the nerve rather than mopped up by the dopamine transporter."

Dr Opacka-Juffry said: "It is in the combination of these stimulant and [hallucinogenic](#) properties that the greatest danger lies. Pure hallucinogens are not addictive as such because they do not cause an increase in dopamine release, unlike amphetamine or cocaine. They are attractive to many people who enjoy the 'mind altering' properties of hallucinogens. But Benzo Fury with its mixed properties is a trap as its repetitive use for the hallucinogenic effects could lead to dependence, which the user may not expect."

Further work needs to be carried out to find out more. "Rat data are quite informative as the brain addiction pathway is similar in rodents and humans. Long-term effects should be tested in rodents to investigate the potential toxic effects on the nervous system and the cardiovascular system, in addition to its liability for abuse due to addiction. We also need to collate data from human users. Taken together we can determine how dangerous this drug is," she said.

Benzo Fury is currently one of the most popular legal highs in the UK and is also sold in the USA. It appears to be fairly easy to buy via the internet, at music festivals and clubs, and its street price is around £10 a pill or £25 for three. "However, tragedies such as the death of 19-year-old Alex Heriot at a music festival in June 2012 after taking Benzo Fury demonstrate the importance of making as much information available as possible about the potential adverse effects of these 'highs' as quickly as possible," said Dr Opacka-Juffry.

Drs Opacka-Juffry and Davidson report that the approach they used to study Benzo Fury could be applied to other drugs as well, so that as new legal high drugs emerge, they can be tested quickly against the "gold

standard" drugs such as cocaine and amphetamines to establish their relative danger.

Dr Davidson said: "Over the last few years 40 or more new legal highs have appeared each year. Given the speed with which [legal highs](#) are developed and reach the market, it is important to be able to respond quickly to assess their potential dangers, and disseminate this information accordingly."

Provided by St. George's University of London

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