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Popular “designer drugs” mimic the effects of Ecstasy in the brain

DOI: 10.1038/npp.2011.304

The neurobiological effects of the widely available “designer drugs” mephedrone and methylone are similar to the illegal drug MDMA, commonly known as Ecstasy, suggests research published online in *Neuropsychopharmacology*. The new study elucidates the mechanism of action of these compounds, and sheds light on the toxicity and abuse potential of substances that are known by innocuous names such as “bath salts” or “plant food”.

Mephedrone and methylone are structurally related to MDMA and used for personal experimentation, mood elevation and “legal highs”. By performing studies in brain tissue systems and in the brains of conscious rats, Michael Baumann and colleagues found that the action of mephedrone and methylone on dopamine and serotonin transporters resembles that of MDMA. The results suggest that neurotransmitter release is similarly evoked by each of the compounds, with a larger magnitude of effect on serotonin compared to dopamine. However, at high doses, the drugs began to produce different effects – in addition to subtle behavioral differences between the test groups, administration of MDMA results in more severe hyperthermia, and MDMA-exposed rats display a long-term depletion of serotonin that was not found in response to either of the designer drugs.

Designer drugs are often available over the Internet and in retail shops, and sold under names that offer few clues about their illicit nature. This research increases public awareness of the potential misuse of these products, and will help to inform future policy decisions regarding their legality.

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