Taking the party out of ecstasy - a strategy for new Parkinson's disease drugs?

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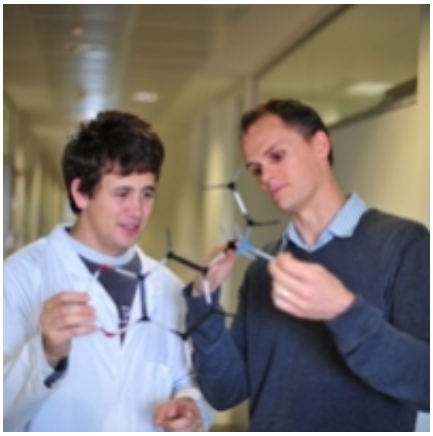

(Medical Xpress) -- The illicit drug ‘ecstasy' is strongly associated with rave culture, but can a drug that makes people want to dance be used to develop medicines that curb involuntary movements in Parkinson's disease? A team led by a medicinal chemist at The University of Western Australia thinks it may be possible.

Associate Professor Matthew Piggott said Parkinson's patients have a great deal of difficulty moving without medication. The drug levodopa restores their movement but, over time, side-effects often develop. These include a reduction in therapeutic duration (‘on-time') and jerky, involuntary movements known as dyskinesia.

"Dyskinesia is often confused as a symptom of Parkinson's disease, when in fact it is a side-effect of the treatment," Associate Professor Piggott said.

"For some time now we've known that the drug most commonly sold as 'ecstasy', methylenedioxymethamphetamine (MDMA), ameliorates the side-effects of levodopa therapy. But MDMA has no therapeutic potential because it makes users 'high'. Although controversial, there is also evidence that MDMA may be neurotoxic, or at least responsible for long-term, deleterious changes in brain chemistry."

The team of UWA scientists, in collaboration with Parkinson's disease experts in Toronto, has now demonstrated that it is possible to dissociate the beneficial effects of MDMA from its undesirable attributes. The feat was achieved through the creation of MDMA analogues - new compounds with a similar chemical structure to MDMA.

"The best compound, which we call UWA-101, is even more effective than MDMA at enhancing the quality of levodopa therapy. In the best animal model of Parkinson's disease, UWA-101 lengthened on-time by up to 30%. More importantly, UWA-101 increased the proportion of on-time that was of good quality (i.e. without disabling dyskinesia) by 178%. If translated to a medicine, this would mean that Parkinson's patients could take their medication less frequently and get a better quality result from it," Professor Piggott said.

UWA psychopharmacologist Professor Mathew Martin-Iverson and PhD student Zak Millar, have shown that UWA-101 is unlikely to be psychoactive, based on studies in rats. In addition, UWA-101 is not toxic to a cell line used to model MDMA-induced neurotoxicity. UWA-101 is therefore a promising lead for the development of new drugs to improve quality of life for Parkinson's sufferers.

The results were recently published in the Journal of the Federation of American Societies for Experimental Biology, and featured on the ABC's 7:30 program.

Provided by University of Western Australia