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Modified Ecstasy holds promise as potent blood cancer treatment

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Scientists at the University of Birmingham have discovered a modified form of the drug MDMA - commonly known as Ecstasy - which has 100 times more cancer-busting properties than the popular recreational drug itself and which they hope may be able to be produced in a safe form to treat patients.

Research results published online today (18 August 2011) in the journal Investigational New Drugs show significant success in 'redesigning the designer drug' for potential use as a cancer-killing agent in the treatment of leukaemia, lymphoma and myeloma.

The new work builds on the Birmingham scientists' discovery six years ago that more than half of the cancers of white blood cells they looked at responded in the test tube to the growth-suppressing properties of psychotropic drugs. These include amphetamine derivatives such as Ecstasy and weight-loss pills, and antidepressants such as fluoxetine (Prozac).

At the time, the team stressed that translating their laboratory findings into a useable clinical compound would present significant problems, not least because the dose of MDMA required to treat a cancerous tumour would have proved fatal to the patient. They aimed to break down the actions of the drug to isolate its cancer-killing properties from its general toxicity.

Working with researchers from the University of Western Australia who produced the new compounds for them, the Birmingham scientists found specially modified forms of Ecstasy boosted in their ability to attack and destroy cancerous cells by a factor of 100. Importantly for the future, they believe they understand the mechanism behind this.

Lead author Professor John Gordon, from the University of Birmingham's School of Immunology and Infection, explains: 'Together, we were looking at structures of compounds that were more effective. They started to look more lipophilic, that is, they were attracted to the lipids that make up cell walls. This would make them more 'soapy' so they would end up getting into the cancer cells more easily and possibly even start dissolving them. By knowing this we can theoretically make even more potent analogues of MDMA and eventually reach a point where we will have in our drug cabinet the most potent form we could.'

He adds: 'This is an exciting next step towards using a modified form of MDMA to help people suffering from blood cancer. While we would not wish to give people false hope, the results of this research hold the potential for improvement in treatments in years to come.'

The team now hopes to go on to develop pre-clinical studies.

Dr David Grant, Scientific Director of the national charity Leukaemia & Lymphoma Research, which part funded the research, comments: "The prospect of being able to target blood cancer with a drug derived from Ecstasy is a genuinely exciting proposition. Many types of lymphoma remain hard to treat and non-toxic drugs which are both effective and have few side effects are desperately needed. Further work is required but this research is a significant step forward in developing a potential new cancer drug."

Ends

Notes to Editors
Paper: Enhancing the anti-lymphoma potential of 3,4-methylenedioxymethamphetamine (Ecstasy) through iterative chemical redesign: mechanisms and pathways to cell death.

For more information, please contact Jenni Ameghino, University of Birmingham Press Officer +44(0)121 415 8134. Mobile 07768 924156.

Professor John Gordon is available for interview. Please contact the press office to arrange.

• Professor John Gordon has, since 1994, held a personal chair in cellular immunology at Birmingham and has gained international recognition for his research into B lymphocytes (antibody producing white cells) and the cancers which can arise from these cells, namely leukaemia and lymphoma.

• Leukaemia & Lymphoma Research is the only UK charity solely dedicated to research into blood cancers, including leukaemia, lymphoma and myeloma. These cancers are diagnosed in around 30,000 children, teenagers and adults in the UK every year. Further information, including patient information booklets, is available from www.beatingbloodcancers.org.uk or on 020 7405 0101.

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