Scientists find new drug target for hard-to-treat leukaemia

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(Medical Xpress) -- Cancer Research UK scientists have discovered a promising new approach to treat a type of myeloid leukaemia – a cancer with limited treatment options and relatively poor survival, according to research published in Cancer Cell today.

The team at the Paterson Institute for Cancer Research at The University of Manchester have identified a new drug target – an enzyme called LSD1 – for an aggressive form of acute myeloid leukaemia called mixed lineage leukaemia (MLL). LSD1 helps control whether certain cancer-causing genes are turned on or off. Blocking the enzyme prevents the production of proteins that drive the cancer.

Scientists at Cancer Research UK's Paterson Drug Discovery Unit synthesised molecules to block this enzyme, and lead author Dr Tim Somervaille, group leader at Cancer Research UK's Leukaemia Biology Laboratory, showed that they could stop the growth of leukaemia cells – taken from patients with the disease, and also from mice.

Every year in the UK around 2,380 people are diagnosed with acute myeloid leukaemia and of these it is estimated that around five percent – around 120 patients – have the MLL subtype.

Survival for acute myeloid leukaemia remains low although it has improved. Currently, around forty percent of people aged under 60 with the MLL-AF9 subtype survive the disease for five years or more.

Dr Somervaille said: “It’s difficult to successfully treat patients with this type of leukaemia. There aren’t any targeted drugs available and many patients can’t be cured with current treatments, such as intensive chemotherapy and bone marrow transplantation. So there’s an urgent need for new drugs.

“We’re very pleased to have tested molecules that homes in on an enzyme called LSD1 in a completely new approach to stop the growth of this disease. And we also believe this target may be important in a range of other types of cancer, but more research is needed.

“The next stage is to develop molecules like this one further, and run clinical trials to see if they could be used to treat patients in the future.”

Dr Julie Sharp, Cancer Research UK’s senior science information manager, said: “It’s great news that this molecule could provide a new targeted way to treat an aggressive type of leukaemia, for which treatment options are limited.

“Our scientists have been at the heart of progress that has seen great improvements in the treatment of leukaemia. For example, we developed some of the first important drugs for blood cancers and pioneered treatment with radiotherapy. And we’ve revealed many of the gene changes that fuel the development and growth of blood cancers, paving the way for future treatments.

“But there is much more to be done and, only with continued public support, can our scientists around the UK continue their groundbreaking research into leukaemia to learn more about the biology of the disease – and improve survival.”

More information: Harris, W. et al (2012). The Histone Demethylase KDM1A Sustains the Oncogenic Potential of MLL-AF9 Leukemia Stem

Cells Cancer Cell DOI: 10.1016/j.ccr.2012.03.014