

Protein that inhibits and reduces the effects of chemotherapy identified

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Researchers at Karolinska University Hospital and Karolinska Institutet and their colleagues from Science for Life Laboratories (SciLifeLab) and Heidelberg University have identified a protein that determines the efficacy of cytarabin – the most important drug for treating acute myeloid leukaemia. Their results are published in the scientific journal *Nature Medicine*.

Some 350,000 people around the world are diagnosed every day with the aggressive form of [blood cancer](#) known as [acute myeloid leukaemia](#) (AML), only 25 per cent of whom survive beyond the fifth year. Over twenty years ago, [survival rates](#) were improved by the use of high doses of the cytotoxin cytarabin, but the efficacy of the drug declines over time in some patients. The mechanism of this resistance has remained something of a mystery; however, in the present study, which involved analyses of 300 patients, the researchers show that a protein called SAMHD1 plays a major part in this by reducing the effect of cytarabin in leukaemia cells, and that leukaemia cells with lower levels of SAMHD1 respond better to the drug. The team was also able to make leukaemia [cells](#) more sensitive to cytarabin by blocking the protein.

"Our results go a long way to unlocking the pharmacology of cytarabin in the treatment of leukaemia," says Nikolas Herold, researcher at Karolinska University Hospital and Karolinska Institutet. "We hope that the results will eventually help to improve the treatment of AML using cytarabin combined with substances that block SAMHD1. More studies will be needed first, however."

More information: Nikolas Herold et al. Targeting SAMHD1 with the Vpx protein to improve cytarabine therapy for hematological malignancies, *Nature Medicine* (2017). [DOI: 10.1038/nm.4265](https://doi.org/10.1038/nm.4265)

Provided by Karolinska Institutet

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