

Statins found to enhance efficacy of chemotherapy drug in blood cancers

June 14 2018, by Bob Yirka



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A team of researchers with members affiliated with several institutions in the U.S. has found that some statins could enhance the efficacy of a chemotherapy drug used to fight blood cancers in mouse models. In their paper published in the journal *Science Translational Medicine*, the group describes their study of statins used with the chemotherapy drug venetoclax and what they found.

Statins are a group of drugs that are administered to patients to reduce fats in the blood. They are typically used to reduce levels of triglycerides and cholesterol, fats associated with heart attacks and strokes. In this new effort, the [researchers](#) found that they might also be useful for treating some [blood cancers](#).

Prior research has shown that statins promote apoptosis (natural cell death) in some types of cancers—a finding that suggests they might be useful for treating those forms of cancer. In their work, the researchers found that the statin simvastatin enhanced the efficacy of venetoclax in fighting chronic lymphocytic leukemia in mouse models. It helped, they discovered, by increasing apoptosis signaling in cancer cells, resulting in less lymphoma. The result was an increase in survival times. They note also that they found stronger results than if either drug were administered alone.

Emboldened by their findings, the researchers looked at data from three prior clinical trials involving testing venetoclax for use in treating [chronic lymphocytic leukemia](#). They specifically sought out data regarding patients who had also been given statins to reduce fats in the blood. They found that those patients saw a better response against their cancer than those who did not take the [statin](#). They noted also that such patients were 2.7 times more likely to see complete remission.

If statins work the same in humans, the researchers suggest, clinical use could begin quite soon since statins have already been approved by the

FDA—millions of people around the world use them regularly to keep cholesterol levels down. In addition to reducing fats in the blood, they have also been shown to have few side-effects. The researchers believe clinical trials should be conducted to find out if statins could improve the outcomes of patients with leukemia and other blood cancers.

More information: Statins enhance efficacy of venetoclax in blood cancers, *Science Translational Medicine* 13 Jun 2018: Vol. 10, Issue 445, eaaq1240 , [DOI: 10.1126/scitranslmed.aaq1240](https://doi.org/10.1126/scitranslmed.aaq1240)

Abstract

Statins have shown promise as anticancer agents in experimental and epidemiologic research. However, any benefit that they provide is likely context-dependent, for example, applicable only to certain cancers or in combination with specific anticancer drugs. We report that inhibition of 3-hydroxy-3-methylglutaryl coenzyme A reductase (HMGCR) using statins enhances the proapoptotic activity of the B cell lymphoma-2 (BCL2) inhibitor venetoclax (ABT-199) in primary leukemia and lymphoma cells but not in normal human peripheral blood mononuclear cells. By blocking mevalonate production, HMGCR inhibition suppressed protein geranylgeranylation, resulting in up-regulation of proapoptotic protein p53 up-regulated modulator of apoptosis (PUMA). In support of these findings, dynamic BH3 profiling confirmed that statins primed cells for apoptosis. Furthermore, in retrospective analyses of three clinical studies of chronic lymphocytic leukemia, background statin use was associated with enhanced response to venetoclax, as demonstrated by more frequent complete responses. Together, this work provides mechanistic justification and clinical evidence to warrant prospective clinical investigation of this combination in hematologic malignancies.

Citation: Statins found to enhance efficacy of chemotherapy drug in blood cancers (2018, June 14) retrieved 24 April 2024 from <https://medicalxpress.com/news/2018-06-statins-efficacy-chemotherapy-drug-blood.html>

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