

A good vitamin D status can protect against cancer

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A good vitamin D status is beneficial both in cancer prevention and in the prognosis of several cancers, according to a new research review. The anti-cancer effects of vitamin D are especially pronounced in the

prevention and treatment of colon cancer and blood cancers. In addition, high vitamin D responsiveness can be linked to a smaller cancer risk. Vitamin D responsiveness varies between individuals, affecting their need for vitamin D supplementation.

The review article, published in *Seminars in Cancer Biology* and written by Professor Carsten Carlberg from the University of Eastern Finland and Professor Alberto Muñoz from the Autonomous University of Madrid, provides an update on the molecular basis of [vitamin D](#) signaling and its role in [cancer](#) prevention and therapy.

Vitamin D is commonly known for its crucial role in bone health, but the authors point out it also regulates the [immune system](#), and its anti-cancer effects are mediated mainly by [immune cells](#), such as monocytes and T cells. Vitamin D exerts its effects via the vitamin D receptor (VDR), which is a transcription factor involved in the expression and epigenetic regulation of numerous genes.

According to the review, studies focusing on the effect of vitamin D on different types of cancers provide the strongest evidence of its benefits in colorectal cancer and in blood cancers, such as leukemias and lymphomas. Vitamin D is important both for the differentiation of blood cells during hematopoiesis as well as adult stem cells in rapidly regenerating tissues, such as colon or skin. A too low vitamin D status leads to a suboptimal function of the VDR and in an increased risk that these cells are not fully differentiating and start to turn into uncontrolled growing cancer [cells](#).

Even in other types of cancer, such as breast and prostate cancer, a low vitamin D status, measured as the level of 25-hydroxyvitamin D in the blood, has been associated with a higher cancer incidence and a poorer prognosis. However, vitamin D supplementation has not been consistently shown to reduce cancer mortality in randomized controlled

trials. According to the authors of the review, the impact of vitamin D could be shown more clearly if the participants were stratified according to their individual vitamin D responsiveness and the health outcomes analyzed in relation to changes in individual vitamin D status.

Professor Carlberg's research group has earlier shown that individuals differ in their molecular response or sensitivity to vitamin D supplementation. For example, 25% of the Finnish population seem to be low responders, needing a higher dose of vitamin D supplementation to reach the full clinical benefit. In terms of cancer risk, being a high responder can be expected to have a protective effect.

According to the review, a good vitamin D status is beneficial in general [cancer prevention](#). There is less evidence of its usefulness in the treatment of cancer.

More information: Carsten Carlberg et al. An update on vitamin D signaling and cancer, *Seminars in Cancer Biology* (2020). [DOI: 10.1016/j.semcancer.2020.05.018](#)

Provided by University of Eastern Finland

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