The circadian clock: A regulator of immunity in cancer

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Video Byte

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Abstract

The circadian clock tunes cells in the body to the rhythm of the solar day on earth. Over the past few years, studies have shown that disruption of this rhythm contributes to various cancers. For example, women who work nights instead of days have been shown to carry an approximately 10% increased risk of breast cancer. That's because, much like other bodily functions, the immune system is subject to natural fluctuations, with certain immune cells peaking during the day and others at night. This regular oscillation means that the circadian clock controls many aspects of immune functions, including those related to cancer. These functions include the release and presentation of cancer cell antigens and the activation of immune cells, the trafficking and infiltration of immune cells into tumors and the elimination of cancer cells. These discoveries have paved the way toward anti-cancer treatments that target components of the biological clock. Experimental evidence suggests that such treatments can reduce drug toxicity and improve tumor response rates and duration. While clock-based immunotherapies are still in their infancy and require further investigation, they represent a powerful new way of harnessing the immune system in the fight against cancer.