

Researchers discover possible new target for sarcoma treatment and prevention

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Researchers from Mount Sinai School of Medicine have discovered a protein signaling pathway that becomes hyperactivated in human sarcoma cells, suggesting that medications to inhibit this pathway may be effective in the treatment of human sarcomas. The research is published in the current issue of the journal *Cancer Cell*.

A team of researchers led by Stuart Aaronson, MD, Jack and Jane B. Aron Professor and Chairman of the Department of Oncological Sciences at Mount Sinai School of Medicine, compared normal human mesenchymal stem cells to human [sarcoma](#) cells and found that the sarcoma cells displayed hyperactive signaling along the [Wnt pathway](#) – a complex network of proteins that interact with each other in a highly ordered manner to regulate numerous biological functions of various species.

The hyperactive Wnt signaling increased the growth of several subtypes of human sarcoma cells by increasing the expression of CDC25A, a gene previously shown to be deregulated in various types of cancer. Increased [protein](#) levels of CDC25A enhances the rate of cell proliferation, and [cancer cells](#) often exhibit very high CDC25A protein levels compared to normal cells.

"The prevalence of Wnt signaling hyperactivity in human sarcoma cells gives researchers a potential new target as they develop medications to target human sarcoma," said Dr. Aaronson.

"Since several cancer types show increased CDC25A levels, it is regarded as a good target to generate therapeutic agents to dampen its functions and thus will be an important candidate in future drug development," said Sapna Vijayakumar, PhD, Instructor of Oncological Sciences, Mount Sinai School of Medicine, who was the first author of the study.

Normal Wnt functioning is critical for maintaining tissue homeostasis. Hyperactive (deregulated) Wnt signaling is reported to be one of the early causes of colon cancer, and it is also implicated in several other cancer types.

In many instances, hyperactive Wnt signaling increases the expression of certain genes that cause the cell to proliferate faster than normal. This uncontrolled proliferation, often accompanied by additional changes in gene or genes independent of Wnt signaling, can transform a normal cell into a cancerous one.

Sarcomas comprise about one percent of all adult cancers, but about 15 percent of all childhood cancers. There are many sarcoma "subtypes" that can arise from a variety of connective tissue structures, including nerves, muscles, joints, bone, fat, and blood vessels. The most frequent location for sarcomas are the limbs, where the majority of the body's connective tissue is located. About 20 percent of sarcomas are curable by surgery, while 30 percent can be cured by surgery with chemotherapy and/or radiation. About 12,000 new cases are diagnosed in the US each year and about 5,000 people die each year from sarcoma.

Sarcomas are subtyped based on where they occur in the body (in the bone, they are called osteosarcoma, in the smooth muscle they are leiomyosarcoma, in the cartilage they are chondrosarcoma, and so on). Studies suggest that even though sarcomas can occur in any part of the body, they commonly arise from the transformation of [mesenchymal](#)

[stem cells.](#)

Provided by The Mount Sinai Hospital

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