

# Too much SP2 protein turns stem cells into 'evil twin' cancer cells

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Researchers at North Carolina State University have found that the overproduction of a key protein in stem cells causes those stem cells to form cancerous tumors. Their work may lead to new treatments for a variety of cancers.

Dr. Jon Horowitz, associate professor of molecular biomedical sciences, and a team of NC State researchers looked at the protein SP2, which regulates the activity of other genes. They knew that elevated amounts of SP2 had been observed in human prostate-cancer patients, and that these levels only increased as the tumors became more dangerous. They then showed that precisely the same thing occurs in mouse skin tumors.

Horowitz and the team decided to look at SP2 as a possible cause of [tumor formation](#) in epithelial cell-derived tumors, which comprise about 80 percent of all human tumors; epithelial cells cover the body's internal and external surfaces. They found that overproduction of the SP2 protein in epithelial stem cells stopped them from spawning mature descendants. The affected stem cells, unable to produce mature cells, just kept proliferating, resulting in the formation of tumors.

The researchers' results are published in the Nov. 3 edition of the journal *Cancer Research*.

"Something happens to normal stem cells that changes the way SP2 is regulated, and it starts being overproduced," Horowitz says. "SP2 basically hijacks the stem cell, and turns it into its evil twin – a cancer

cell."

Now that the link between tumor formation and SP2 has been shown, Horowitz says, scientists can turn their attention to looking at ways to target the overproduction of this protein. "Our hope is that we can find an 'antidote' to SP2, to restore normal cell proliferation to those cancer [stem cells](#) and reverse the process."

**More information:** "Overexpression of Transcription Factor Sp2 Inhibits Epidermal Differentiation and Increases Susceptibility to Wound and Carcinogen-Induced Tumorigenesis", Published: Nov. 3 in *Cancer Research*.

Provided by North Carolina State University

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