

Knockout of protein prevents colon tumor formation in mice

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A protein that regulates cell differentiation in normal tissue may play a different role in colon and breast cancer, activating proliferation of damaged cells, according to researchers at the University of Illinois at Chicago College of Medicine.

The protein, called PTK6, is found in normal skin and gut cells -- and in cancerous, but not normal, breast tissue.

"Our research has primarily focused on the normal function of this protein in the gut, where it regulates growth and differentiation," said Angela Tyner, professor of biochemistry and molecular genetics.

[Epithelial cells](#), such as [skin cells](#) and the cells that line the colon, turn over rapidly. To replace them, new cells must be continuously produced that become specialized, or differentiated, to perform specific functions.

To further their investigation of PTK6, Tyner and her colleagues developed a mouse that lacked the PTK6 gene. Based on their observation of increased growth in the intestine, Tyner's group suspected that mice lacking PTK6 would be more susceptible to cancer.

Using a carcinogen, the researchers induced [colon tumors](#) resembling human sporadic colon cancer in mice lacking the PTK6 gene and in normal mice.

"Mice lacking PTK6 were highly resistant to the carcinogen and

developed fewer tumors," Tyner said. "It was an unexpected result."

Tyner and her colleagues were able to establish the reason for this unexpected result. They found that PTK6 was activating a protein responsible for turning genes on and off called STAT3. Previous studies have established a role for STAT3 in proliferation and found that it plays an important role in many epithelial cancers, including skin cancer and colon cancer.

PTK6 seems to be playing opposite roles in normal and [cancer cells](#), Tyner said.

"We believe that PTK6 may play a role in initiation of cancer in the colon, but we don't yet know what role PTK6 may play in metastasis."

Tyner's laboratory is continuing to investigate the role of PTK6 in cancer, which may provide a future target for therapies not only for [colon cancer](#) but breast cancer as well.

More information: The study is published in *Gastroenterology*.

Provided by University of Illinois at Chicago

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