

Tales from the crypt lead researchers to cancer discovery

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Tales from the crypt are supposed to be scary, but new research from Vanderbilt University, the HudsonAlpha Institute for Biotechnology and colleagues shows that crypts can be places of renewal too: intestinal crypts, that is. Intestinal crypts are small areas of the intestine where new cells are formed to continuously renew the digestive tract. By focusing on one protein expressed in our intestines called Lrig1, the researchers have identified a special population of intestinal stem cells that respond to damage and help to prevent cancer.

The research, published in the March 30 issue of *Cell*, also shows the diversity of stem cells in the intestines is greater than previously thought.

"Identification of these cells and the role they likely play in response to injury or damage will help advance discoveries in cancer," said Shawn Levy, Ph.D., faculty investigator at the HudsonAlpha Institute and an author on the study.

The intestines and colon are normally lined with a single layer of cells to absorb nutrients from food. There are regular small pockets in the intestines called crypts, where stem cells are gathered. Rapid turnover of the lining cells and replacement by new lining cells made in the crypt, keep the intestines and colon healthy and keep damaged cells from turning into cancerous ones.

The new paper demonstrates that, although the makeup of stem cells in the crypt is still controversial, one protein called Lrig1 can distinguish a

group of long-lived cells at the base of the crypt. These Lrig1-positive stem cells do not regularly replace lining cells, but instead are only activated when there is damage or injury to the [intestine](#).

In addition, the researchers show that the Lrig1 [protein functions](#) to prevent cancer as a tumor suppressor molecule. When the protein is completely absent from a [mouse model](#), the mice all develop [adenomas](#) and then tumors. This suggests that Lrig1 is an important target for understanding and treating intestinal and [colon cancer](#).

Levy added, "RNA sequencing work at HudsonAlpha found that the Lrig1-positive stem cells are molecularly different in multiple ways from previously identified crypt [stem cells](#), in keeping with their role in responding to damage." Further work on genes expressed or silenced in this population of cells, he added, will increase understanding of both normal and cancer cell progression in the intestines.

More information: www.cell.com/

Provided by HudsonAlpha Institute for Biotechnology

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