

## **Cancer and Bacteria**

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Maintaining the right balance of beneficial bacteria in the gastrointestinal tract might help protect against conditions such as inflammatory bowel disease (IBD) and ultimately cancer, according to an article published in the May issue of *Current Drug Targets*.

The intestines are naturally teeming with millions of microorganisms. Most of these bacteria have a symbiotic relationship with their human hosts. The intestines provide a warm, moist environment in which the bacteria can grow. In return, the bacteria help the intestinal immune system develop, protect the gastrointestinal tract against disease-causing bacteria, aid in the absorption of large molecules, and help produce vitamin

K.

However, sometimes this delicate balance can shift. More harmful species of bacteria can begin to prevail over more benign microorganisms. And some people's immune systems may not have the proper mechanisms to control these damaging bacteria, according to the article's author, Maria Rescigno, Director of the Dendritic Cells and Immunotherapy Unit, Department of Experimental Oncology at the Istituto Europeo di Oncologia in Milan, Italy.

A shift in balance in favor of harmful bacteria can lead to IBD, an inflammatory condition that researchers have linked to a higher incidence of gastrointestinal cancers. "IBD is a chronic inflammation, and indeed patients with IBD (particularly ulcerative colitis) are more prone to develop tumors," Dr. Rescigno says.

How exactly certain bacteria contribute to cancer development is not known. One theory is that the bacteria gain control of the cell cycle and allow cancerous cells to multiply. Or, it may be that certain bacteria release carcinogenic chemicals or trigger the release of substances via an immune response that allow cancer cells to multiply. Particular types of bacteria species have been linked to an increased cancer risk—particularly *Helicobacter*.

Once researchers discovered the link between harmful bacteria in the gut and increased cancer risk, they began looking for ways to reduce that risk. Attention has turned to probiotics—dietary supplements containing live beneficial bacteria. In research conducted so far, probiotics positively shifted the composition of bacteria in the gut, and reduced the development of tumors in animals. It's also possible that probiotics might activate the immune system and reduce the inflammation that could eventually lead to cancer development.

Despite the potential of probiotics, however, it is too early to recommend them for cancer prevention. "It is not yet known which probiotic to propose that works in humans," Dr. Rescigno says. "Animal studies may not be representative." Researchers need to determine through human trials the particular function of each type of probiotic, in order to create the most appropriate treatments.

Source:

Rescigno M. The pathogenic role of intestinal flora in IBD and colon cancer. *Current Drug Targets*. 2008;9:395-403.