

Blocking signal molecule can prevent growth of large intestine and colon cancer

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By seeing what substances and molecules affect the development of our diseases, we can develop drugs that prevent or cure diseases. In her dissertation at Kalmar University in Sweden, Ann Novotny has found that the signal molecule acetylcholine (ACh) is important for the progress of cancer of the large intestine and colon, knowledge that is important to factor in when developing drugs that block the effects of ACh on tumor cells.

Cancer of the large intestine and colon is the third most common cancer form in the Western world. Survival over a five-year period in Sweden is roughly 56 percent, but depends on how far the cancer has spread when it is discovered. It is known that the cancer has developed ways to signal in order to be able grow and spread independently of the regulatory systems of normal cells. In order to increase the number of survivors, it is important to map this signaling so that new forms of treatment for the cancer can be devised.

Ann Novotny studied the signaling used by the cancer in a portion of large intestinal and colon cancer. She found that there are receptors for opioids, such as morphine, on [tumor cells](#). If morphine is supplied to these cells the [protein](#) urokinase is released, which the cancer cells can use to enhance their capacity to spread.

She also studied the nerve signaling molecule acetylcholine (ACh) and discovered that the cancer cells both build up and degrade the molecule. The study shows that the molecule is constantly released from the tumor

cells and binds to a special receptor on the same cells, which leads to increased cell production as well as increased production of urokinase, which enhances the ability of the [cancer cells](#) to spread. These receptors can also be activated by nicotine, but also by the peptide SLURP-1 (secreted mammalian Ly-6/urokinase plasminogen activator receptor-related protein-1).

The levels of several enzymes, [receptors](#), and the peptide SLURP-1 differ in early and late cancer of the large intestine and in healthy and diseased colons. This knowledge should help us develop drugs that block the effects of acetylcholine on tumor cells, which should be able to keep this [cancer](#) from developing further.

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