

Lawson researchers take control of cancer

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According to the Canadian Cancer Society, one in four Canadians will die of cancer. This year alone, the disease will kill an estimated 75,000 people. With incidence rates on the rise, more cancer patients are facing grave prognoses. Fortunately, Lawson Health Research Institute's Dr. John Lewis, Dr. Ann Chambers, and colleagues have found new hope for survival. Their new study released today in *Laboratory Investigation* shows that maspin, a cellular protein, can reduce the growth and spread of cancer cells - but only when it is in the nucleus.

Maspin is believed to inhibit the formation, development, and spread of tumors in several aggressive cancers, including breast, ovarian, and head and neck cancers. Yet efforts to use this information to predict how [cancer patients](#) will fare have been challenging; the presence of maspin has been linked to both good and bad prognoses. Dr. Lewis, Dr. Chambers, and their team believed that this inconsistency was caused by the location of maspin in the cell, whether in the nucleus or in the [cytoplasm](#), and sought to test this theory.

To assess the effects of maspin on [tumor growth](#) and development, they tested two aggressive cancers: a highly invasive [head and neck cancer](#), and a [breast cancer](#) known to spread to the lymph nodes and the lungs. The team introduced two forms of maspin into the [cancer cells](#), one that went into the nucleus and one that was blocked from the nucleus. Then they injected the cells into both chicken embryo and mouse models of cancer and asked the simple question: which one slowed the cancer down?

It turned out the answer was simple: when maspin was allowed to get into the nucleus of the cancer cells, the disease's ability to spread was significantly limited. In fact, the incidence of metastasis was lowered from 75% to 40%. When maspin was not established in the nucleus; however, this ability was reversed and cancer cells were far more likely to spread. These findings demonstrate that the location of maspin within the cell significantly influences cancer cells' behavior, determining how aggressive the disease will be and how positive patient outcomes will be.

"The difference is night and day," Dr. Lewis says. "Metastasis is the cause of 90% of cancer deaths. We can now clearly see that maspin is working in the nucleus to dramatically reduce both the extent and the size of distant metastases."

"This study resolves a mystery in which maspin was sometimes linked with poor patient prognosis and sometimes with good patient prognosis," Dr. Chambers explains. "Our new work suggests that when maspin is located in the nucleus it blocks cancer growth and spread. This study may help doctors to understand how aggressive a patient's cancer will be, and may also lead to new targets for drug development."

Provided by Lawson Health Research Institute

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