

Blocking signaling protein prevents prostate cancer spread

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Researchers at the Kimmel Cancer Center at Jefferson in Philadelphia have shown that by blocking a signaling protein, they can prevent prostate cancer cells from metastatic dissemination. The work opens the door to future studies examining the protein as a target for therapies aimed at keeping prostate cancer at bay.

In a series of experiments in both the laboratory and animal models, Marja Nevalainen, M.D., Ph.D., associate professor of Cancer Biology at Jefferson Medical College of Thomas Jefferson University and her co-workers found that the protein, Stat3, is key to the metastatic progression of prostate cancer. Dr. Nevalainen's group reports its findings in the June 2008 issue of the *American Journal of Pathology*.

According to Dr. Nevalainen, previous studies have shown that Stat3 is very active in metastatic prostate cancer, and the protein has been linked to cancer metastasis in several different cancer types. Because metastatic prostate cancer lacks effective therapies, understanding the molecular changes involved is critical.

To clarify Stat3's role in prostate cancer progression, she and her co-workers performed several studies. In one case, the scientists used an antibody for Stat3, for example, to show that it is activated in 77 percent of lymph nodes and 66 percent of bone metastases in human prostate cancer. In another experiment, the scientists prompted mouse prostate cancer cells to overproduce the normal Stat3 protein by delivering it through a virus vehicle. They saw a dramatic increase in prostate cancer

metastases compared to controls.

Specifically, in mice lacking a working immune system, they showed that Stat3 caused a 33-fold increase in metastases.

"This is the first proof that Stat3 may have a major effect on metastatic dissemination of prostate cancer," Dr. Nevalainen says. "Stat3 now becomes a potential drug target to interfere with the metastatic progression of prostate cancer."

While her team's results "open up other opportunities to study the mechanism of prostate cancer metastases," Dr. Nevalainen notes that Stat3 might have possible use in the prevention of primary prostate cancer from progressing to metastatic disease as well.

She suggests that studies testing newly developed Stat3 inhibitors in prostate cancer should include testing their effectiveness in blocking prostate cancer metastases in experimental animal models.

Source: Thomas Jefferson University

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