Clue to switch of bladder cancer from locally contained to invasive found

May 14 2010

Bladder cancer often becomes aggressive and spreads in patients despite treatment, but now researchers at the Kimmel Cancer Center at Jefferson have identified a protein they believe is involved in pushing tumors to become invasive - and deadly.

"We have found that IGF-IR is a critical regulator of motility and invasion of bladder cancer cells, and this could offer us a novel molecular target to treat patients with this cancer in order to prevent metastasis," said the lead investigator, Andrea Morrione, Ph.D., a research associate professor of Urology at Jefferson Medical College, and director of Urology Research, Kimmel Cancer Center.

This finding is promising, they say in the June issue of American Journal of Pathology, because there are about a dozen agents targeted against the protein, the insulin-like growth factor receptor I (IGF-IR), that are now undergoing clinical testing to treat a variety of patient tumors.

"Testing presence of the protein could also serve as a novel tumor biomarker for diagnosis, and possibly prognosis of bladder tumors," he added.

Although bladder cancer is common, the molecular mechanisms that push the cancer to become invasive and to spread are still poorly understood, say the researchers. Although most bladder cancers are caught early and treated, they often come back and become aggressive, despite subsequent therapy with surgery, chemotherapy, or

immunotherapy.

In this study, the researchers looked at the role of the protein receptor for the growth factor IGF-I, an important modulator of cell proliferation in bladder cancer cells. They found that although activation of IGF-IR did not affect growth of bladder cancer cells, it did promote the migration and invasion of these cells. The researchers showed that IGF-IR activated other molecules in cancer-promoting pathways (Akt and MAPK) that allow cancer cells to break its bond with other cells in a tumor in order to travel to others sites in the body.

"These data seem to indicate that this protein receptor may play a more prominent role in later stages of bladder cancer, not in the initiation of the cancer," said Dr. Morrione.

Additional work is needed to validate the role of IGF-IR in pushing bladder cancer into an invasive form, but if the results continue to be promising, it might be possible to test anti IGF-IR therapies in bladder cancer and to see how effective a test for these proteins in bladder tumor biopsies might predict cancer spread, the researchers say.

Provided by Thomas Jefferson University