Blood pressure drugs halt pancreatic cancer cell growth, researchers find

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Researchers at the Kimmel Cancer Center at Thomas Jefferson University in Philadelphia are inching closer to understanding how common blood pressure medications might help prevent the spread of pancreatic cancer. They have found in the laboratory that one type of pressure-lowering drug called an angiotensin receptor blocker inhibits pancreatic cancer cell growth and causes cell death.

In earlier work in the laboratory, Hwyda Arafat, M.D., Ph.D., associate professor of Surgery at Jefferson Medical College, and her team showed that angiotensin receptor blockers may help reduce the development of tumor-feeding blood vessels, a process called angiogenesis. Other studies have linked a lower incidence of cancer with the use of angiotensin blocking therapies. Such drugs, she says, may become part of a novel strategy to control the growth and spread of cancer.

One of these drugs – AT1R (Ang II type 1 receptor) blockers – inhibit the function of the
hormone angiotensin II (Ang II) in the pancreas. The receptor is expressed in pancreatic
cancer cells. Ang II increases the production of VEGF, a vascular factor that promotes blood vessel growth in a number of cancers. High VEGF levels have been correlated with poor cancer prognosis and early recurrence after surgery. Dr. Arafat's research team has shown that AngII indirectly causes VEGF expression by increasing AT1R expression.

Dr. Arafat's group explored the effects of blocking AT1R on the pancreatic cancer cell reproductive cycle and programmed cell death, or apoptosis, and the mechanisms involved. It found that blocking AT1R inhibited pancreatic cancer cell growth and promoted cell death. "This happens through inducing the activity of the gene p53, which controls programmed cell death, and also by inhibiting anti-cell death pathways such as those involving the gene bcl-2." The team reports its findings April 14, 2008 at the annual meeting of the American Association for Cancer Research in San Diego.

The researchers also found that blocking AT1R affects p21, a gene that regulates the cell cycle. "We found that blocking this receptor can cause cell cycle arrest," she notes.

"This is really exciting because the role of this receptor has never been known," Dr. Arafat says. "It's never been connected to cell division or apoptosis. We're also now further exploring the mechanisms involved. The exciting thing is that this receptor already has so many available pharmaceutical blockers on the market." Ultimately, the group hopes to be able to test these agents in human trials, she says.

Source: Thomas Jefferson University