MedicalXpress

Zinc transporters regulate pancreatic cancer

November 12 2007

Zinc, an important trace element for healthy growth and development, can be related to pancreatic cancer. Too much ZIP4, a molecule that enables the transport of zinc into cells, promotes the growth and spread of pancreatic tumors cells, said a group of researchers from Baylor College of Medicine in Houston, The University of Texas M.D. Anderson Cancer Center and the University of Florida in Gainesville, in a report which appears online today in the *Proceedings of the National Academy of Sciences*.

“Zinc plays a critical role in our bodies functioning properly,” said Dr. Min Li, assistant professor of the Michael E. DeBakey Department of Surgery at BCM, and lead author of the study. “Zinc must be regulated through proteins called zinc transporters to keep us healthy.”

A previous study by one of Li’s collaborators, Dr. Craig Logsdon, professor and Lockton Distinguished Professor for Pancreatic Cancer Research at M.D. Anderson, identified high levels of ZIP4 in pancreatic cancer tissue. Li’s current study confirmed those findings and also showed that overexpressed ZIP4 increases zinc uptake by the cell, which results in significantly increased tumor growth.

“We need to put these in a big picture and look at the zinc and zinc transporters as a whole in regulating pancreatic cancer growth. There is no simple answer at this point on the role zinc itself is playing,” said Li.

“This study shows strong evidence that the zinc transporter is over expressed in pancreatic cancer,” said Dr. Changyi (Johnny) Chen,

Molecular Surgery Endowed Chair, professor of surgery and vice chair for research in the Michael E. DeBakey Department of Surgery at BCM. “Our next step for research will ask why this happens in pancreatic cancer.”

Results showed that 16 of the 17 pancreatic cancer specimens and seven of the eight cell lines grown in the laboratory had higher levels of ZIP4 than healthy tissues and normal pancreatic ductal cells. Researchers then introduced ZIP4 protein into the one pancreatic cancer cell line that did not already over express the molecule. Compared to the original line, the new cells accumulated 73 percent more zinc and significantly increased tumor growth.

This is the first comprehensive study to focus on pancreatic cancer and zinc transporters which has not been previously described. More research is needed before doctors know if limiting or targeting zinc or ZIP4 would affect the progression of pancreatic cancer.

“This study has tremendous impact on pancreatic cancer research because it not only suggests a novel diagnostic marker, but also indicates a candidate for cancer vaccine development” said Dr. Qizhi (Cathy) Yao, professor of the Michael E. DeBakey Department of Surgery and molecular virology & microbiology at BCM.

“Identifying this molecule as being related to tumor growth opens up a door for us, “said Logsdon. “Our hope is that this will lead to a target for new treatments and therapies.”

Source: Baylor College of Medicine