MedicalXpress

Protein inhibits tumor growth

June 19 2014

Cleveland: A previously unknown variant of an extensively studied protein has been found to inhibit the growth of tumors and slow the development of new blood vessels necessary for cancers to metastasize, according to Cleveland Clinic research published today in *Cell*.

The creation of new blood vessels, or angiogenesis, is a vital part of cancer growth and metastasis. Blood vessels carry nutrients and oxygen, which tumors need to survive, expand, and migrate to other parts of the body. A family of proteins called vascular endothelial growth factors (VEGFs) are behind the process of angiogenesis, and one particular protein, VEGF-A, is the principal driver in the process.

However, a research team led by Paul Fox, Ph.D., of the Department of Cellular and Molecular Medicine in Cleveland Clinic's Lerner Research Institute, has discovered that a variant of VEGF-A, one they call VEGF-Ax, actually decreases angiogenesis, cutting off the blood supply to tumors and inhibiting their development in animal models.

"This research is significant because it will open new avenues of angiogenesis and cancer research. It is important for patients as it could potentially lead to new diagnostic tools and improved treatments to reduce the spread of cancer." Dr. Fox said. "It is truly remarkable that a small change in a protein sequence leads not just to a protein with a different function, but one with a function completely opposite to the original. In the context of cancer, the small extension changes a very 'bad' protein into a very 'good' one."

VEGF-Ax is 22 amino acids longer that VEGF-A, and is formed when the ribosome—the cellular machinery that translates genes (actually messenger RNAs) into proteins—reads through its genetic stop sign in a process called programmed translational readthrough.

Provided by Cleveland Clinic