Researchers discover new enzyme in cancer growth

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While studying the mechanics of blood clots, researchers at the University of Oklahoma Health Sciences Center discovered a new enzyme that not only affects the blood, but seems to play a primary role in how cancer tumors expand and spread throughout the body. The research appeared in recent issues of the journal *Blood* and the *Journal of Thrombosis and Haemostasis*.

A research group at OU led by Patrick McKee first discovered the enzyme called sFAP in plasma. After studying the biochemical makeup of the protein and identifying the gene that controlled its function, they began to search gene sequencing databases worldwide to find what it was. They didn't find the enzyme listed for blood, but got a match with a virtually identical protein known to cause cell growth in tissue, including in cancer. With McKee's discovery that the protein also exists in blood, scientists have a new avenue to study the spread of cancer.

"One thing all cancer cells need as they grow is something that acts as scaffolding. They have to attach to the scaffolding to divide and migrate. This enzyme excavates space around a malignancy and helps create the scaffolding," said McKee, M.D., principle investigator on the project.

The main function of the original FAP protein that was known to exist in tissue is to accelerate tissue growth and expand cells during fetal development, the healing of severe wounds and during growth of selected cancers such as breast, lung, pancreatic and colon.

Other than in these situations, the original form of FAP is not normally expressed in tissues at all. When it does appear, the protein helps activated fibroblasts, which growing cancer cells are able to recruit and stimulate to multiply within the malignancy itself. This creates space and the framework on which cancer cells attach, divide and eventually spread.

If FAP could be inhibited, then cancer growth could be slowed or halted, which in combination with chemotherapy or radiation might offer the potential to actually cure the malignancy, the OU team believes.

McKee and his group of investigators hold one patent on the enzyme and three more are under review for the development of an inhibitor. Based on the discovery and numerous publications of their work, the OU Health Sciences Center recently received a $365,000 federal grant from the U.S. Department of Defense to work on an inhibitor with cancer investigators at the University of Arkansas for Medical Sciences.

Source: University of Oklahoma