Researchers unravel biochemical factor important in tumor metastasis

November 9 2011

A protein called "fascin" appears to play a critical transformation role in TGF beta mediated tumor metastasis, say researchers at Moffitt Cancer Center in Tampa, Fla., who published a study in a recent issue of the *Journal of Biological Chemistry*.

According to study corresponding author Shengyu Yang, Ph.D., of Moffitt's Comprehensive Melanoma Research Center and the Department of Tumor Biology, elevated Transforming Growth Factor beta in the tumor microenvironment may be responsible for fascin over-expression, which in turn can promote metastasis in some metastatic tumors.

TGF beta is a versatile cytokine involved in many physiological and pathological processes in adults and in the developing embryo, including cell growth, cell differentiation, cell death (apoptosis) and cellular homeostasis. TGF beta is best known as a tumor suppressor, exerting growth inhibitory roles in normal tissue and early stage tumors. However, many metastatic tumors are able to overcome the growth inhibition and secreted elevated levels of TGF beta to promote tumor metastasis. How TGF beta promotes metastasis is not completely understood. The authors suggested that fascin may be the key to understand the pro-metastasis function of TGF beta, as fascin knockdown almost completely abolished TGF beta induced tumor cell migration and invasion.

The researchers explained that fascin levels are low or not detected in

normal tissues, but are highly elevated in malignant tumors. Also, high fascin expression is associated with poor prognosis. It has been clear for some time, they noted, that there is a causal role for fascin over-expression in tumor cell dissemination. However, the underlying mechanism for the elevation of fascin levels has not been clarified. Their analysis using cell culture- based assay and patient microarray data mining strongly suggests that elevated TGF beta levels in tumors lead to fascin overexpression, which in turn promotes metastasis.

"Our data suggests that fascin is an immediate TGF beta target gene essential for its pro-invasion activity in cancer metastasis," explained Yang.

While there have been many studies on the role of fascin in tumor cell migration and metastasis, the current study is first to report that TGF beta elevates fascin protein expression to promote invasion, particularly in tumor cells of spindle-shaped – the kind of morphology associated with high tumor invasiveness and more metastatic disease.

"The finding that TGF beta only induces fascin over-expression in highly metastatic tumor cells is especially interesting," said Yang. "Therapies targeting fascin may block TGF beta mediated metastasis without interfering with the tumor suppressor role of TGF beta in normal tissues."

Provided by H. Lee Moffitt Cancer Center & Research Institute

Citation: Researchers unravel biochemical factor important in tumor metastasis (2011, November 9) retrieved 1 May 2024 from https://phys.org/news/2011-11-unravel-biochemical-factor-important-tumor.html