New function of gene in promoting cancer found

November 22 2010

Researchers at Virginia Commonwealth University have discovered that a gene well known for its involvement in tumor cell development, growth and metastasis also protects cancer cells from being destroyed by chemotherapy. By inhibiting the expression of this gene, doctors may have a new viable and effective approach for treating aggressive cancers such as breast, liver and prostate carcinomas, malignant gliomas and neuroblastomas that result from high expression of this cancer-promoting gene.

The new study was reported the week of Nov. 22 in *PNAS Early Edition*, an online publishing of the latest scientific research by the Proceedings of the National Academy of Sciences. The work was a collaboration among researchers from VCU Massey Cancer Center, the VCU Institute of Molecular Medicine (VIMM), and the Department of Human and Molecular Genetics of the VCU School of Medicine, and was led by Paul B. Fisher, M.Ph., Ph.D., Thelma Newmeyer Corman Endowed Chair in Cancer Research at VCU Massey.

The involved gene, AEG-1 (astrocyte elevated gene-1), has been known to directly contribute to cancer cell survival, chemotherapeutic drug resistance and tumor cell progression by regulating diverse intracellular processes. This study reveals for the first time a previously unknown aspect of AEG-1 function by identifying the gene as a potential regulator of protective autophagy, which shields cancer cells from destructive agents and environmental insults and is an important feature that may contribute to AEG-1's tumor-promoting properties. The research further

shows that protective autophagy also contributes to AEG-1's chemoresistance properties, and that inhibition of AEG-1 enhances tumor cells' response to chemotherapy.

"Understanding how AEG-1 promotes resistance to chemotherapy and enhances cancer cell survival may lead to treatments that inhibit this gene and its regulated pathways, thereby uncovering potentially new therapeutic targets that can be exploited to enhance the ability of anticancer drugs to fight tumors," said Fisher, who is also chair of VCU's Department of Human and Molecular Genetics and director of VIMM. "The potential for translating these findings into beneficial approaches for patients is major, particularly for patients with aggressive cancers that are difficult to treat because of resistance to current therapies."

Provided by Virginia Commonwealth University