Tumor vessels identified by unique molecular markers

June 11 2007

Results from a new study have made it easier for scientists to distinguish between growing blood vessels in healthy tissues and those that are associated with tumors. This is a significant finding because this distinction, particularly at a molecular level, has remained elusive for quite some time. The research, released in the June issue of the journal Cancer Cell, published by Cell Press, has exciting implications for development of more selective vascular-targeted anticancer therapeutics.

A major strategy for destroying cancer cells has been to disrupt the growing blood vessels that support tumor growth. However, current vascular-targeted therapies may also damage normal growing blood vessels. This is a concern because the formation of new blood vessels, or angiogenesis, continues to occur in adults, for example, during pregnancy, menstruation, and wound healing. Dr. Brad St. Croix and colleagues from the National Cancer Institute at Frederick executed a series of studies aimed at identifying markers that can be used to distinguish between proliferating blood vessels in normal and diseased tissues.

The researchers systematically examined gene expression patterns in the endothelial cells that line blood vessels derived from normal resting tissues, regenerating tissues, and tumors. A comparison of the normal vessels revealed several organ-specific endothelial genes that could potentially aid in the delivery of molecular medicine to specific anatomical sites. The study also revealed 13 genes that are selectively overexpressed in tumor blood vessels. Although the function of most of

the newly identified genes in tumor blood vessels is unclear, many of the genes encode cell surface proteins, making them appealing targets for the development of new therapeutic agents.

One of the cell surface proteins identified, called CD276, was found to be frequently overexpressed in the blood vessels of a variety of human cancers. The researchers also report that in many of the tumors examined CD276 was also overexpressed by the tumor cells, making this protein a particularly attractive target because a suitable inhibitory molecule might be able to deliver a double blow: one to the tumor cells themselves and the other to the blood vessels that feed it. “These studies reveal that tumor vessels contain a unique molecular fingerprint that can be used to distinguish them from normal proliferating vessels,” explained Dr. St. Croix; “they also provide new targets that could help guide the development of safer vascular-targeted therapies with potentially fewer side effects.”

Source: Cell Press