New treatment strategy identified for tumors associated with diabetes

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If you have diabetes and cancer, here's some hope. In a new research report appearing in the September 2015 issue of *The FASEB Journal*, scientists reveal a newly discovered tissue- and organ-specific mechanism that regulates blood vessel growth, and when inhibited reduced the growth of tumors in diabetic mice. In addition to the treatment of the diabetes-related cancers, the approach may be also used to treat other diabetic complications that are associated with the increased blood vessel growth, like retinopathy or nephropathy for example.

"Complications of diabetes are the main reason for mortality and hospitalization of diabetic patients. The advanced methods of measuring and regulation of the blood sugar levels resulted in deaths from diabetic coma being very rare, but the vascular complications remain an important problem that leads to mortality and loss of quality of life," said Olga Stenina-Adognravi, Ph.D., a researcher involved in the work from the Department of Molecular Cardiology at the Cleveland Clinic in Cleveland, Ohio. "Developing a new organ-specific way to prevent and treat the vascular complications and cancer growth in diabetic patients is the goal of our work."

To make their discovery, Stenina-Adognravi and colleagues injected diabetic mice that had breast cancer, with the small nucleic acid fragment (inhibitor) that targeted and neutralized the main regulator of the blood vessel growth induced by the high blood sugar. The control group of animal models received a similar nucleic acid fragment that did

not have any effect. At the end of the experiments, the tumors were excised, measured and examined for growth of the blood vessels in these tumors. They found that the inhibitor, which blocked the pathway initiated by the high blood sugar and led to increased blood vessel growth, caused the blood vessels and the cancer to grow slower. The same inhibitor did not have any effect in organs and tissues unaffected by the increased blood vessel growth.

"Diabetes is a very serious disease and its association with cancer is ominous," said Gerald Weissmann, M.D., Editor-in-Chief of *The FASEB Journal*. "This research helps us understand what goes wrong with tumor blood vessels in diabetes. It not only explains how high blood sugar promotes the growth of cancers, but also outlines a strategy for treating tumors in patients with diabetes."

More information: Irene Krukovets, Matthew Legerski, Pavel Sul, and Olga Stenina-Adognravi Inhibition of hyperglycemia-induced angiogenesis and breast cancer tumor growth by systemic injection of microRNA-467 antagonist. *FASEB J*. September 2015 29:3726-3736; DOI: 10.1096/fj.14-267799

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