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Researchers identify a signaling pathway as possible target for cancer treatment

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In a new study published in the August 16th issue of *Developmental Cell*, researchers at NYU Langone Medical Center identified a molecular mechanism that guarantees that new blood vessels form in the right place and with the proper abundance.

"We have known for a long time that blood vessels branch to give rise to new ones and that in some places of our bodies this branching occurs with a reproducible pattern. However, the mechanisms that ensure that new vessels sprout at specific locations had not been uncovered until now," said Jesús Torres-Vázquez, PhD, assistant professor of Developmental Genetics at the Skirball Institute of Biomolecular Medicine at NYU School of Medicine. "Our study illuminates the genetic basis behind the reproducible pattern of the vasculature and suggests ways in which the formation of new blood vessels could be modulated to treat certain cancers in the future."

Using the zebrafish embryo as a model system, researchers identified that Semaphorin-PlexinD1 signaling limits the formation of new blood vessels. This signaling pathway works by ensuring that blood vessels make the proper levels of soluble Flt1. Soluble Flt1 is an inhibitor of the Vascular Endothelial Growth Factor (VEGF) pathway, which promotes the growth of new blood vessels.

These findings have broad implications for human health, since changes in the level of soluble Flt1 are associated with cancer, vascular birth defects and pregnancy-related hypertension (preeclampsia).

According to researchers, the Semaphorin-PlexinD1 signaling pathway shows significant promise as a future therapeutic target for cancer treatment to slow the progression of diseases by controlling the blood vessel growth.

In addition, a related study by Dr. Torres-Vázquez illuminates how the development of the brain and its vasculature is coordinated providing greater understanding about why defects form in the brain's blood vessels and how the blood vessels of the brain form. These study findings were published in the July 2011 issue of *Developmental Biology.*

Provided by New York University School of Medicine