Docket #: S23-525

Managing cancer-promoted atherosclerosis through gene regulation

Stanford researchers have discovered that tumors increase the risk of atherosclerosis by regulating expression of a specific gene that stimulates angiogenesis and intraplaque neovessel formation.

Previous studies have shown that cancer patients have a significantly higher risk of developing atherosclerosis than those without cancer. However, the underlying mechanisms responsible for this increased risk have not yet been identified. Understanding the cancer processes that influence atherosclerosis is crucial for developing therapies to reduce the burden of cardiovascular disorders in cancer patients and survivors.

Researchers from the Leeper Lab at Stanford University have identified a specific gene in aortic endothelial cells that is responsible for tumor-promoted atherosclerosis. By comparing mRNA expression levels in the aortic arches of mice with and without tumors, they found that this gene is upregulated in the presence of tumors. The tumor-promoted upregulation was also confirmed in cultured human aortic endothelial cells. The increased expression of this gene triggers angiogenesis and intraplaque neovessel formation, contributing to heightened atherogenesis and plaque vulnerability. An effective dose of an agent that inhibits this gene could stabilize, prevent, or reduce atherosclerotic plaque formation in cancer patients.

Stage of Development
In vivo animal data, *in vitro* human cell data

Applications

- RNA silencing products

- Neutralizing antibodies
- Gene modification products

Advantages

- No competing technologies and products targeting tumor-promoted atherosclerosis

Publications

- Luo, L., Haas, A. M., Bell, C. F., Baylis, R. A., Adkar, S. S., Fu, C., Angelov, I., Giordano, S. H., Klarin, D., Leeper, N. J., & Nead, K. T. (2024). Cancer Incidence After Diagnosis of Abdominal Aortic Aneurysm-Brief Report. *Arteriosclerosis, thrombosis, and vascular biology, 44*(7), 1694–1701.
- Bell, C. F., Lei, X., Haas, A., Baylis, R. A., Gao, H., Luo, L., Giordano, S. H., Wehner, M. R., Nead, K. T., & Leeper, N. J. (2023). Risk of Cancer After Diagnosis of Cardiovascular Disease. *JACC CardioOncology, 5*(4), 431–440.

Patents

- Published Application: WO2025207399

Innovators

- Lingfeng Luo
- Nicholas Leeper

Licensing Contact

Kimberly Griffin

Technology Licensing and Strategic Alliances Manager

Email