Research to advance cancer therapy

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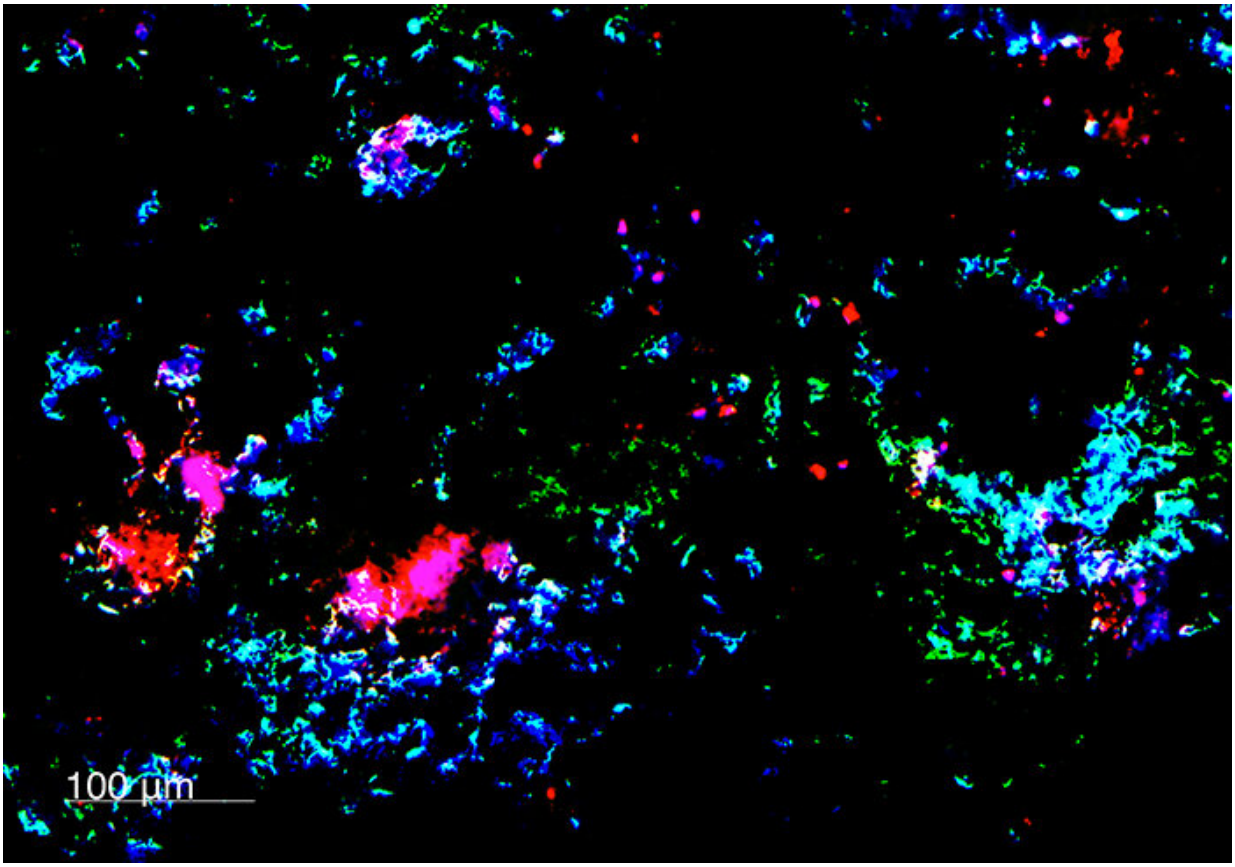

Credit: Louisiana State University

Research led by Suresh Alahari, Ph.D., the Fred Brazda Professor of Biochemistry and Molecular Biology at LSU Health New Orleans School of Medicine, has found a new role for a protein discovered by his lab in preventing the growth and spread of breast cancer. The results of the

study, which could have a significant impact on cancer therapy, are published in the OnlineFirst section of the journal *Cancer Research*.

Dr. Alahari discovered the novel protein, Nischarin, which is involved in a number of biological processes including the regulation of breast cancer cell migration and movement. Although his lab has shown that Nischarin functions as a tumor suppressor, research continues to uncover new information that may lead to better treatments.

In the current study, the research team investigated Nischarin's function in exosome release. Exosomes are nano-sized vesicles (fluid-filled sacs) containing proteins, genetic and other material involved in both physiological and pathological processes. Tumor-derived exosomes contain various signaling messengers for intercellular communication involved in tumor progression and metastasis of cancer. Tumor exosomes influence the interactions of various types of cells within the tumor microenvironment, regulating tumor development, progression and metastasis. Primary tumors release exosomes that can enhance seeding and growth metastatic cancer cells.

Among the researchers' findings: Nischarin regulates cell attachment and alters the properties of exosomes. Exosomes from Nischarin-positive cells reduce breast cancer cell motility and adhesion, as well as tumor volume. Nischarin-positive cells release fewer exosomes, and cell survival is decreased. Co-culturing breast cancer cells with Nischarin-positive exosomes decreases tumor growth and lung metastasis.

"This novel role for the tumor suppressor Nischarin not only increases our understanding of the exosome biology, but can be translated to identifying new targets for modulating cancer metastasis," notes Dr. Alahari. "Inhibition of the secretion of exosomes may serve as an effective treatment for cancer."

According to the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) Program, which includes data from LSU Health New Orleans' Louisiana Tumor Registry, breast cancer represented 15.3% of all new cancer cases and 6.7% of all cancer deaths in 2018. There were an estimated 266,120 new cases of breast cancer in the US and an estimated 40,920 deaths.

"It has been shown that exosomes can be developed as carriers for delivering drugs," Alahari adds. "Nischarin-expressing exosomes in combination with drugs will likely have very good therapeutic effect on breast cancer patients."

More information: *Cancer Research* (2019). DOI: 10.1158/0008-5472.CAN-18-0842 , cancerres.aacrjournals.org/con … 008-5472.CAN-18-0842

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