

Research identifies a promising new therapeutic target for aggressive breast cancer

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Scientists at Western University have identified a new therapeutic target for advanced breast cancer which has shown tremendous promise in mouse models. The study led by Lynne-Marie Postovit of Western's Schulich School of Medicine & Dentistry looked at a protein called Nodal that is primarily found in embryonic or stem cells. Postovit discovered high levels of this protein in aggressive breast cancer tumors. Nodal was found to promote vascularization in the tumor, providing nutrients and oxygen to help it grow and spread. The research is published online in the journal *Cancer Research*.

"We have determined that breast cancers, specifically those very aggressive, invasive breast cancers that spread, express an embryonic protein called Nodal and the expression of this protein is correlated with more [blood vessels](#) in the tumor. Blood vessels, many studies have shown, help to allow tumors to grow but also to spread throughout the body," says Postovit of the Department of Anatomy and Cell Biology. "In addition, we have shown that if we can target this embryonic protein, we can cause the blood vessels to collapse within the tumor, leading to decreased oxygen levels and tumor cell death. When tumors lack oxygen and nutrients they become what we call necrotic."

In the study, mouse models were designed to develop [breast cancer](#) tumors. Then, using a genetic modification, the researchers turned off the expression of Nodal. When they did that, the blood vessels in the

tumor appeared to collapse, and the [tumor](#) was less aggressive. Nodal is on the outside of the cell, so it can be easily targeted by a number of mechanisms including antibodies. And because Nodal isn't expressed in normal tissue in the body, it would be possible to target just the cancer, allowing for better patient outcomes.

"Ultimately it would be nice to target Nodal in patients who already have quite advanced, well-vascularized tumors as a new option for therapy," says Daniela Quail, first author on the research and a PhD candidate in the Postovit lab. "Currently, patients like this don't have many options."

"In Canada, breast cancer continues to be one of the most common forms of cancer in women. Although new treatment methods have improved outcomes, a significant number of women still die from this disease", says Dr. Morag Park, Scientific Director of the Canadian Institutes of Health Research. "Research advancements, such as Dr. Postovit's, have contributed and will continue to contribute to the improvements around our understanding of cancer progression and treatment. I congratulate Dr. Postovit and the team on this advancement and its significant contribution to this field."

Provided by University of Western Ontario

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