Team learns how to predict triple negative breast cancer recurrence

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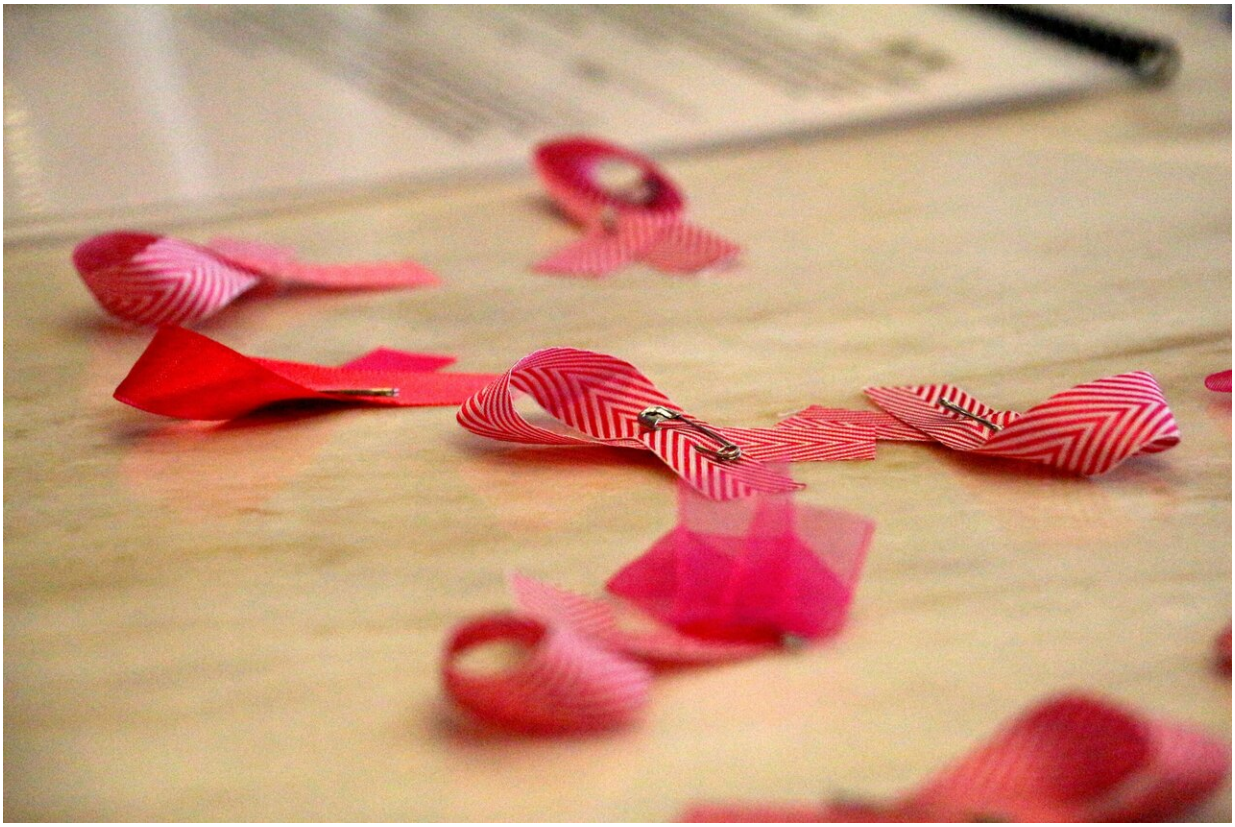

Credit: Anna Carrera

Indiana University School of Medicine researchers have discovered how to predict whether triple negative breast cancer will recur, and which women are likely to remain disease-free. They will present their findings

on December 13, 2019, at the San Antonio Breast Cancer Symposium, the most influential gathering of breast cancer researchers and physicians in the world.

Milan Radovich, Ph.D., and Bryan Schneider, MD, discovered that women whose plasma contained genetic material from a tumor—referred to as circulating tumor DNA—had only a 56 percent chance of being cancer-free two years following chemotherapy and surgery. Patients who did not have circulating tumor DNA, or ctDNA, in their plasma had an 81 percent chance that the cancer would not return after the same amount of time.

Triple negative breast cancer is one of the most aggressive and deadliest types of breast cancer because it lacks common traits used to diagnose and treat most other breast cancers. Developing cures for the disease is a priority of the IU Precision Health Initiative Grand Challenge.

The study also examined the impact of circulating tumor cells, or CTCs, which are live tumor cells that are released from tumors somewhere in the body and float in the blood.

"What we found is that if patients were negative for both ctDNA and CTC, 90 percent of the women with triple negative breast cancer remained cancer-free after two years," said Radovich, who is lead author of this study and associate professor of surgery and medical and molecular genetics at IU School of Medicine.

Advocates for breast cancer research say they are excited to hear about these results.

"The implications of this discovery will change the lives of thousands of breast cancer patients," said Nadia E. Miller, who is a breast cancer survivor and president of Pink-4-Ever, which is a breast cancer advocacy

group in Indianapolis. "This is a huge leap toward more favorable outcomes and interventions for triple negative breast cancer patients. To provide physicians with more information to improve the lives of so many is encouraging!"

Radovich and Schneider are researchers in the Indiana University Melvin and Bren Simon Cancer Center and the Vera Bradley Foundation Center for Breast Cancer Research. They lead the Precision Health Initiative's triple negative breast cancer team.

The researchers, along with colleagues from the Hoosier Cancer Research Network, analyzed plasma samples taken from the blood of 142 women with triple negative breast cancer who had undergone chemotherapy prior to surgery. Utilizing the FoundationOne Liquid Test, circulating tumor DNA was identified in 90 of the women; 52 were negative.

The women were participants in BRE12-158, a clinical study that tested genomically directed therapy versus treatment of the physician's choice in patients with stage I, II or III triple negative breast cancer.

Detection of circulating tumor DNA was also associated with poor overall survival. Specifically, the study showed that patients with circulating tumor DNA were four times more likely to die from the disease when compared to those who tested negative for it.

The authors say the next step is a new clinical study expected to begin in early 2020, which utilizes this discovery to enroll patients who are at high risk for recurrence and evaluates new treatment options for them.

"Just telling a patient they are at high risk for reoccurrence isn't overly helpful unless you can act on it," said Schneider, who is senior author of this study and Vera Bradley Professor of Oncology at IU School of

Medicine. "What's more important is the ability to act on that in a way to improve outcomes."

Organizers of the San Antonio Breast Cancer Symposium selected the research to highlight from more than 2,000 scientific submissions.

This study was funded by the Vera Bradley Foundation for Breast Cancer and the Walther Cancer Foundation. It is part of the Indiana University Precision Health Initiative Grand Challenge. The study was managed by the Hoosier Cancer Research Network and enrolled at 22 clinical sites across the United States.

What they're saying:

IU School of Medicine Dean Jay L. Hess, MD, Ph.D., MHSA: "While we have made extraordinary progress in treating many types of breast cancer, triple negative disease remains a formidable challenge. We are dedicating substantial expertise and resources to this disease, and this discovery is an important step forward. We will continue to press ahead until we have new therapies to offer women with this most aggressive form of breast cancer."

IU School of Medicine Executive Associate Dean for Research Anantha Shekhar, MD, Ph.D.: "I could not be more proud of our research team here at IU School of Medicine and the IU Precision Health Initiative Grand Challenge. A few years ago, I gave the teams the challenge to come up with targeted treatments, cures and preventions for triple negative breast cancer, where there had been none. The findings, announced today, show we are well on our way to achieving these bold goals."

Indiana University Melvin and Bren Simon Cancer Center Director Patrick J. Loehrer, MD: "Addressing an issue of importance in Indiana

and globally, our IU cancer researchers are making novel discoveries that have the real potential to impact women with triple negative breast cancer. This work does not happen in a vacuum, but is a product of 'team science,' which characterizes the fabric of our National Cancer Institute-designated Comprehensive Cancer Center."

Provided by Indiana University School of Medicine