

Malignant stem cells may explain why some breast cancers develop and recur

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Mutations that are found in stem cells could be causing some breast cancers to develop and may be the reason the disease recurs. These abnormal cells are likely controlling cell functions in the tumor and, given they are not targeted by chemotherapy and radiation, they enable the disease to recur.

The mutations were discovered in a study conducted by scientists and physicians at the Oregon Health & Science University Knight Cancer Institute. The study, which examined breast cancer cells removed during surgery, was recently published online in the *Annals of Surgical Oncology*.

"By studying normal and malignant cells that were collected from breast tissues removed during surgery, we were able to look at what is occurring in the body," said SuEllen J. Pommier, Ph.D., the lead author of the study and associate research professor in the division of surgical oncology at the OHSU Knight Cancer Institute.

Working with samples taken directly from surgeries made the findings in this study possible, Pommier said, because the biology of breast [stem cells](#) could be compared with their malignant counterparts in a way that hadn't been done before. The cultured cell lines used in most studies can't provide accurate information about normal breast stem cells.

The study, which was funded primarily by the Avon Foundation for Women, may prove that some current therapies that target mutations in

the tumor won't be effective in stamping out the disease for some patients. It also suggests that more research should be done in two areas:

- Determining the role of PIK3CA/AKT1 signaling mutations, which were found in 73 percent of the tumors in this study of fresh surgical specimens – an occurrence rate that is much higher than previously detected in stored samples.
- And, exploring the importance of the loss of CD24 expression, which previously was considered a requirement for breast cancer stem cells, but may not be a characteristic of all breast cancer stem cells.

Understanding the biology of individual tumors is the primary mission of the OHSU Knight Cancer Institute. "This study provided us with new insights into [breast cancer](#) stem cells and possibly into the earliest [mutations](#). That information is crucial for developing treatments," Pommier added.

Provided by Oregon Health & Science University

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