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## **Research tackles breast cancer cells that stay behind**

*New drug shows promise in reducing stem cells conventional chemo misses*

*Ensuring that breast cancer doesn't come back means removing the entire tumour — roots and all — suggests new research.*

And a new drug is showing promise in doing just that.

Breast cancer tumours possess stem cells that essentially act as roots. Though anti-cancer drugs can shrink and even kill tumours, these stem cells often remain and eventually lead to a recurrence of the disease.

"It's not enough to kill the dandelion blossom and stalk that appear above ground," said Dr. Michael Lewis, assistant professor of molecular and cellular biology at Baylor College of Medicine in Houston. "You have to kill the root beneath the soil as well."

Researchers found that a cocktail of anti-cancer medicines, along with the drug lapatinib (Tyverb), appeared to kill both tumours and stem cells.

To assess the effects on tumour "roots" of conventional anti-cancer drugs — and conventional chemotherapy drugs in conjunction with lapatinib — researchers divided study participants into two groups.

The participants were women who had been diagnosed with breast cancer that was HER2 negative or HER2 positive. HER2 is a protein that is over-expressed by certain tumours and can accelerate tumour formation and growth.

Lapatinib has been shown in previous studies to be particularly effective in reducing the growth of tumours that overexpress HER2, according to the U.S. National Cancer Institute.

One group of 31 women who were HER2 negative received traditional chemotherapy, which involved a course of docetaxel or doxorubicin and cyclophosphamide for 12 weeks, at standard doses.

The other group of 21 women whose tumours had HER2 markers, were given 1500 mg daily of lapatinib followed by docetaxel and trastuzumab (herceptin) for 12 weeks at standard doses .

The researchers then looked for evidence of stem cells to see whether they decreased in number or stayed the same.

In the group that received traditional chemo, tumour cells decreased but stem cells actually increased in number.

In the group of women that received lapatinib, tumour cells decreased but stem cells stayed the same or decreased slightly. Researchers believe this shows that lapatinib was reducing stem cells at the same rate as tumour cells.

"The tumor shrank dramatically," said Dr. Jenny Chang, associate professor of medicine at the Baylor College of Medicine and medical director of the Lester and Sue Smith Breast Care Cancer Center, in a release. "This means the stem cells were killed off with the same frequency as the bulk of the tumor. This is the first time this has been demonstrated.

"Targeting residual cells with stem cell self-renewal properties in combination with conventional chemotherapy may provide a specific approach to prevent cancer recurrence and improve long-term survival," reads the study.

The study was published online Tuesday in the Journal of the National Cancer Institute.

The authors obtained some funding for the study from GlaxoSmithKline, which makes lapatinib.