

Researchers find driver of breast cancer stem cell metastasis

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The finding involves the cancer gene RhoC, which has previously been shown to promote metastasis of many types of cancer. RhoC levels increase as breast cancer progresses and high levels of RhoC are associated with worse patient survival.

Cancer [stem cells](#) are the small number of cells within a tumor that are believed to fuel the tumor's growth and spread. Researchers believe traditional chemotherapy and radiation treatments often become ineffective because they do not kill the cancer stem cells, and that the key to future treatments is to develop drugs that target and kill these cells.

This new study, which appears online in *PLoS ONE*, suggests a new way to get at the cancer stem cells.

"Targeting the specific molecular cogs driving the cancer stem cell machinery responsible for the cancer spreading has potential for future treatments. Eliminating cancer stem cells may ultimately be necessary to cure certain cancers, but in the meantime, we may be able to manage the cancer stem [cell population](#) and the invasive behaviors of these cells by disrupting the molecular machinery, using RhoC as a target," says senior study author Sofia D. Merajver, M.D., Ph.D., professor of internal medicine and epidemiology at the University of Michigan and scientific director of the breast oncology program at the U-M Comprehensive Cancer Center.

The researchers looked at breast cancer cell lines that were highly metastatic and cell lines from normal [breast tissue](#). By inhibiting or overexpressing RhoC, they found that RhoC expression is necessary to cause metastasis in both cell lines, and that RhoC overexpression alone can cause metastasis. The researchers also tested this in mice and had similar results.

Merajver's lab, in conjunction with other U-M researchers, is studying a novel small molecule drug to inhibit RhoC, which has shown promising initial results in the laboratory. The researchers are continuing to develop this inhibitor, which will require several years of additional testing in the laboratory before potentially advancing to clinical trials.

Breast cancer statistics: 229,060 Americans will be diagnosed with [breast cancer](#) this year and 39,920 will die from the disease, according to the American Cancer Society

More information: *PLoS ONE*, Vol. 7, No. 7, July 2012, [doi: 10.1371/journal.pone.0040979](#)

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