

# Study reveals new details about a protein that enables cancer cells to start new tumors in distant sites

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(Medical Xpress) -- A Loyola University Chicago Stritch School of Medicine study has revealed details of the complex molecular process involving a protein that enables cancer cells to establish tumors in distant parts of the body.

The finding could lead the way to new drugs to prevent [breast cancer](#) and other cancers from spreading to new sites.

The study by Adriano Marchese, PhD, and colleagues is published in the March 16 issue of the [Journal of Biological Chemistry](#).

The study involves a molecule on the surface of cells called CXCR4. There is an abnormal abundance of this molecule in 23 [types of cancer](#), including cancers of the breast, lung, pancreas and thyroid.

What usually kills patients is the spread of cancer from the primary site to other sites. A tumor cell breaks away from the primary site and circulates through the body. A molecule called CXCL12 acts like a beacon to CXCR4, signaling the cancer cell to land and start a new tumor.

The goal of the study was to better understand this complex signaling pathway. (A signaling pathway involves a group of molecules that work together in a cell. After the first molecule in the pathway receives a

signal, it activates another molecule, and the process is repeated until the last molecule is activated.)

"We understand the final outcome of this signaling pathway," Marchese said. "What we are trying to do now is understand the molecular details."

In the study, Marchese and colleagues used a line of human cancer cells called HeLa. (The cell line is the subject of the best-selling book "The Immortal Life of Henrietta Lacks".)

Using HeLa [cancer cells](#), the researchers identified a molecule that is a critical link in the signaling pathway. Researchers hope to target this molecule, thereby disabling the signaling pathway and preventing the cancer cell from setting up shop in a new site, Marchese said.

The next step will be to develop a drug that blocks the [target molecule](#). Researchers then would test the drug on an animal model. If the drug worked in animals, it later could be tested in a clinical trial of cancer patients, Marchese said.

"We are laying the groundwork for the development of [new drugs](#) to stop cancer from spreading," Marchese said.

Provided by Loyola University Health System

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