To fight incurable metastatic breast cancer, resistance must be broken

December 10 2012

One of the most frustrating truths about cancer is that even when a treatment works, it often doesn't work for long because cancer cells find ways to resist. However, researchers reporting studies done in mice in the December 11, 2012, issue of *Cancer Cell*, a Cell Press publication, may have a way to stay one step ahead in the case of aggressive metastatic breast cancer.

The findings emphasize the importance of basic cancer biology for advancing treatments that are more effective and less toxic, the researchers say.

"We need to gain a better understanding of the wiring diagram of cancer cells in order to anticipate resistance mechanisms and plan the right combination therapies," says Mohamed Bentires-Alj of the Friedrich Miescher Institute for Biomedical Research in Switzerland. "Moreover, we need to better understand how cancer progresses to metastases."

After all, the spreading of cancer through metastasis is responsible for most cancer-related deaths.

In the new study, Bentires-Alj and his colleagues examined cancer cell lines and primary breast tumors to see what happens when those cancers are treated with a new type of therapy that targets the so-called PI3K pathway.

"The PI3K pathway is frequently mutated and activated in several human

cancers where it plays a key role in tumor development and maintenance as well as in resistance to therapy," Bentires-Alj says, which explains why clinical trials evaluating some 26 PI3K inhibitors are now underway.

While those inhibitors are promising, there is some bad news, as the new work shows. When triple-negative breast tumors are hit with PI3K inhibitors, cancer cells begin to produce a chemical that ramps up a second cancer pathway (JAK2/STAT5)—one that encourages the cancer to spread.

Now for the good news: when the researchers treated mice with an aggressive form of breast cancer with drugs to block both PI3K and JAK2/STAT5 pathways, their tumors grew more slowly, spread less readily, and, ultimately, the animals lived longer.

If Bentires-Alj has his way, the findings in mice will lead to clinical trials in the patients who are most likely to benefit: those with particularly aggressive, triple-negative breast cancers.

"We are in the era of personalized medicine," he says. "We hope that this combination therapy will be tested in clinical trials and that the right patients will be selected for these studies."

More information: Britschgi et al.: "JAK2/STAT5 Inhibition Circumvents Resistance to PI3K/mTOR Blockade, Providing a Rationale for Co-targeting these Pathways in Metastatic Breast Cancer." DOI: 10.1016/j.ccr.2012.10.023

Provided by Cell Press

Citation: To fight incurable metastatic breast cancer, resistance must be broken (2012, December 10) retrieved 10 April 2024 from https://medicalxpress.com/news/2012-12-incurable-metastatic-breast-cancer-resistance.html

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.