New biomarker identified in breast and prostate cancers holds promise for treating disease

August 7 2015

Cedars-Sinai researchers have identified a novel genetic biomarker responsible for the progression of many breast and prostate cancers. The finding could bolster efforts to better identify patients who respond to certain types of chemotherapy drugs that attack the most aggressive forms of cancer. Credit: Cedars-Sinai

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responsible for the progression of many breast and prostate cancers. The finding could bolster efforts to better identify patients who respond to certain types of chemotherapy drugs that attack the most aggressive forms of cancer.

"Understanding and identifying biomarkers is a vital step toward cancer research and care," said Michael Freeman, PhD, vice chair of research in the Cedars-Sinai Department of Surgery, and lead author of the study published in the journal *Scientific Reports*. "New profiling strategies exemplified by this study will ultimately improve our ability to treat cancer patients."

The newly identified biomarker - diaphanous- related formin-3 or DIAPH3 - participates in a protein interaction that makes cells rigid. The study found that when this biomarker is lost or lowered, cells become "deformable," squeezing through tissue spaces, causing disease growth or progression. This phenomenon is known as an amoeboid phenotype.

Researchers can utilize this knowledge to better identify patients who will respond to common chemotherapy drugs, called taxanes, which are typically given to patients with the most aggressive forms of cancer. Taxanes work by damaging protein structures in cancer cells.

This is the first study to identify a targeting strategy for tumor cells that exhibit amoeboid properties.

"By identifying cancer biomarkers, then customizing treatment plans for individuals based on this genetic information, we can greatly improve the effectiveness of cancer therapies," said Shlomo Melmed, MD, senior vice president of Academic Affairs and director of the Burns and Allen Research Institute. "This customized plan replaces a one-size-fits-all approach to cancer treatment."

Next steps involve the development of a biomarker tool that will allow researchers to test these findings prospectively in patients.

More information: *Scientific Reports*. 2015 July: Regulation of microtubule dynamics by DIAPH3 influences amoeboid tumor cell mechanics and sensitivity to taxanes. DOI: 10.1038/srep12136

Provided by Cedars-Sinai Medical Center