

Finding pathways to cancer progression may lead to identification of targeted therapies

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Researchers are working to discover how genes interact with each other to lead to cancer progression. This research is expected to lead the way toward the discovery of new targeted therapies against breast cancer, according to a study presented at the Second AACR International Conference on Frontiers in Basic Cancer Research, held here Sept. 14-18, 2011.

For example, the researchers found that a diuretic used to treat hypertension and edema also stops [breast cancer](#) cells from progressing, although this potential treatment is a long way from human trials, said lead researcher Bin Zhang, Ph.D., principal scientist and group leader at Sage Bionetworks in Seattle, Wash.

The researchers analyzed multiple large-scale cancer genomic data sets to find novel pathways and driver genes that help breast cancer progress. They then tested them in the laboratory against various compounds and drugs to see how they would react, explained Zhang.

"We tried to objectively derive a global picture of how genes interact with each other to impact cancer progression so that we could understand holistically the mechanisms underlying this complex disease. Then, we can systematically identify optimal intervention points for drug development," he said.

The researchers found that many genes function as groups corresponding to different pathways, so future targeted therapies would work better if

they target more than one pathway. This also gives credence to the idea that using combination therapy against the different [genetic pathways](#) might help fight cancer better.

Although they tested [breast cancer cells](#), Zhang said, their methods could be used to test other cancers and even other diseases.

"There is an enormous amount of cancer characterization data available, yet it remains challenging to establish models that predict [tumor progression](#) and [drug response](#). We developed complex and advanced algorithms to reconstruct multiscale gene regulatory networks that reveal global patterns of [gene interactions](#) in cancer and also detail regulatory maps," he said. "These networks will serve as a blueprint for us to understand [cancer progression](#) and develop novel therapeutics."

Zhang and colleagues have found a diuretic used to treat hypertension and edema affected the progression of cancer cells. They predicted and successfully validated its novel effectiveness in preferentially killing cancer cells through inhibiting cell cycle pathways that are responsible for uncontrolled cell proliferation.

Based on their prediction, they believe this drug is as effective in culture as several marketed cancer drugs. However, there is still some time until it can be tested in people, according to Zhang.

Provided by American Association for Cancer Research

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