BRCA1 or BRCA2 mutation research may offer treatment option to certain patients

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(Medical Xpress)—Ongoing research at the Methodist Cancer Center could reveal whether metastatic breast cancer patients with BRCA gene mutations are particularly responsive to a drug regimen that includes Veliparib, an investigational drug believed to hamper cancer cells.

"We want to know whether Veliparib's effects are unique to cancer cells and spare normal, healthy, non-cancer cells," said Jenny C. Chang, M.D., a site principal investigator and director of the Methodist Cancer Center. "While having a BRCA mutation is bad because it increases the risk of getting breast cancer, having a BRCA mutation in cancer could also be seen as a positive if we can exploit that weakness with this drug combination."

The project is funded by Abbott Laboratories Inc., which makes Veliparib. The Methodist Cancer Center is one of 30 locations in the United States and Europe participating in the clinical trial.

Veliparib is believed to inhibit proteins called PARPs, which often work in conjunction with BRCA proteins to repair DNA or cause cell death. Like BRCA proteins, PARPs help healthy cells avoid disease. But BRCAs and PARPs are believed to help cancer cells overcome injury or damage caused by radiation and certain types of anti-cancer drugs, too. Veliparib, when administered with standard chemotherapy drugs like carboplatin and paclitaxel, may make the combination treatment work better by not allowing the cancer cells to fix damage caused to them by chemotherapy.

BRCA1 and BRCA2 belong to the tumor suppressor class of genes. Mutations in these genes cause a loss of function, and have been linked to breast and ovarian cancer.

"BRCA mutations may be the Achilles' heel of some breast cancers," said Angel Rodriguez, M.D., site co-PI and director of Methodist's Triple Negative Breast Cancer Clinic. "Cancer cells in BRCA carriers are dependent on PARP because they have no working BRCA protein. PARP inhibitors selectively destroy cancer cells in the carriers of BRCA mutations."

While it is rare for BRCA mutations to be implicated in breast cancer cases, certain groups are more likely to possess abnormal variants of the gene. Families with a history of multiple cancers are at higher risk, as are Ashkenazi Jewish women, of whom one in 40 are estimated to carry a BRCA mutation.

Women who carry a BRCA1 or BRCA2 mutation tend to have breast cancers that are "triple negative," cancer cells that do not express the genes for estrogen receptor (ER), progesterone receptor (PR), or Her2/neu.

Approximately 2.5 million women worldwide live with breast cancer and more than 250,000 women age 40 and under live with breast cancer in the United States. A woman who has inherited a harmful mutation in BRCA1 or BRCA2 is about five times more likely to develop breast cancer than a woman who does not have such a mutation.

Provided by The Methodist Hospital System