

Enzyme that regulates DNA repair may offer new precision treatments for breast and ovarian cancer

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Credit: Mayo Clinic

Researchers at Mayo Clinic have identified an enzyme called UCHL3 that regulates the BRCA2 pathway, which is important for DNA repair. Results of this research are published online in *Genes & Development*.

"DNA encodes the blueprints for our body, and DNA repair is a fundamental mechanism to prevent the accumulation of mutations in DNA and human disease," says senior author Zhenkun Lou, Ph.D., a molecular pharmacologist at Mayo Clinic.

"The BRCA2 pathway is important for DNA repair, and mutation of the BRCA2 gene is linked to increased cancer risk, especially breast cancer and [ovarian cancer](#)."

Dr. Lou says UCHL3 is highly expressed in some cancers, and mutated or deleted in other cancers. Cancer cells with high UCHL3 expression are resistant to chemotherapy; whereas, [cancer cells](#) with low UCHL3 are more sensitive to chemotherapy. Therefore, the expression of UCHL3 could be a guide to develop more precise cancer therapy.

"UCHL3 could be a potential therapeutic target to overcome resistance to chemotherapy in cancer cells that have a high level of UCHL3," Dr. Lou says. He says UCHL3 gene also could be developed into a biomarker in the clinic to guide precision medicine.

"While more research is needed, our studies may provide a novel therapeutic venue to treat women's cancer and thereby contribute to the health and welfare of women," says Dr. Lou.

More information: Kuntian Luo et al. A phosphorylation–deubiquitination cascade regulates the BRCA2–RAD51 axis in homologous recombination, *Genes & Development* (2016). [DOI: 10.1101/gad.289439.116](https://doi.org/10.1101/gad.289439.116)

Provided by Mayo Clinic

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