Washington University in St. Louis
Office of Technology Management

# BIOMARKER TO PREDICT CANCER RESPONSE TO CHEMOTHERAPY

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## Technology Description

Researchers at Washington University in St. Louis have developed a prognostic biomarker that can be used to predict response to genotoxic chemotherapy for patients with basal-like/triple-negative breast cancer. Basal-like/triple-negative breast cancer is considered to be more aggressive and has poorer prognosis than other types of breast cancers. Compared to luminal and Her2-positive breast cancer, few targeted therapies are available for basal-like/triple negative breast cancer. Currently, treatment options include a combination of surgery, radiation, and chemotherapies (most of which are genotoxic). In recent years, newer generation chemotherapeutic agents such as PARP inhibitors show clinical benefit for certain basal-like/triple-negative breast cancer patients. However, the effectiveness of both standard chemotherapies and PARP inhibitors varies greatly between patients. Thus, it would be useful to have a reliable prognostic biomarker to predict patient outcome. To help meet this need the inventors developed a monoclonal antibody, phospho-Ser784-VCP, that can be used to predict genotoxic chemotherapy response. High levels of phospho-Ser784-VCP render tumor cells high ability to survive chemotherapy-induced DNA damage, and correlate with poor survival for chemotherapy-treated patients. With this biomarker patients with higher chance of responding to genotoxic chemotherapies can be selected for treatment. This technology may aid breast cancer treatment as it provides a predictive biomarker for genotoxic chemotherapy response.

## Stage of Research

Validation studies conducted by the inventors show great promise.

## Publications

- Zhu, C., Rogers, A., Asleh, K., Won, J., Gao, D., Leung, S., Li, S., Vij, K. R., Zhu, J., Held, J. M., You, Z., Nielsen, T. O., & Shao, J. (2020). Phospho-Ser784-VCP Is Required for DNA Damage Response and Is Associated with Poor Prognosis of Chemotherapy-Treated Breast Cancer. *Cell reports*, *31*(10), 107745.

## Applications

- Cancer biomarker- predictive biomarker for genotoxic chemotherapy response

## Key Advantages

- New prognostic biomarker to aid treatment of basal-like/triple-negative breast cancer
- Stratify patients for chemotherapy treatment
- Help lower-risk patients avoid over-treatment
- Prognostic value is independent of clinicopathological variables

## Patents

- Patent application has been filed.

## Related Web Links

- Dr. Shao profile