Washington University in St. Louis
Office of Technology Management

FUNCTIONAL BIOMARKERS OF PLATINUM CHEMOTHERAPY AND PARP INHIBITOR RESPONSE

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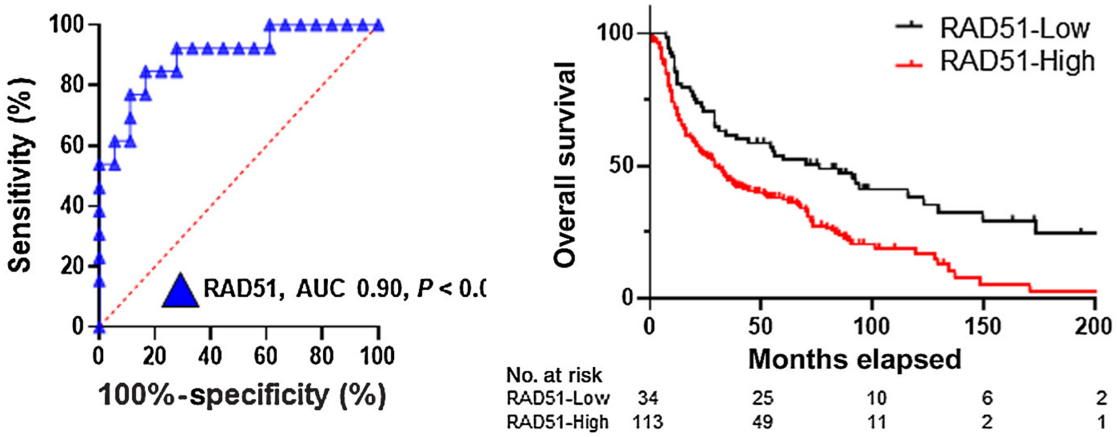
T-020659 — Functional Biomarkers of Platinum Chemotherapy and PARP Inhibitor Response

Technology Description

Most patients diagnosed with high-grade serous ovarian cancer (HGSOC) undergo first-line platinum therapy and PARP inhibitor maintenance therapy. However, the degree to which HGSOC patients respond to platinum and PARPi depends on the tumor's homologous recombination (HR) status. Existing assays to determine HR deficiency rely on genetic testing (e.g. BRCA1/2) or evaluation of genomic instability markers, but they reflect past events and may not adequately capture the present HR capacity of the tumor.

Researchers at Washington University School of Medicine, led by Dr. Mary M. Mullen, have developed an automated, functional assay for determining platinum and PARPi resistance in HGSOC tumors. Using several biomarkers involved in HR, including RAD51, the new assay can predict resistant patient cohort with 100% specificity.



Detection of platinum resistance using FFPE slides and nuclear foci staining with Rad51. The sensitivity of this assay can be improved upon with additional biomarkers (confidential information available). Scores generated using this assay allow clear stratification of HGSOC patients based on their clinical outcomes.

Stage of Research

Optimized assay on various HGSOC lines as well as patient derived organoids. Final assay validation was carried out using FFPE tumor samples. Assay has been automated using in-house software with robust concordance relative to manual methods.

Applications

- Characterization of HGSOC before treatment to minimize unnecessary toxicity and rationally triage patients to therapy.

Key Advantages

- Rapid, inexpensive assay with high accuracy to determine platinum and PARP resistance, supplementing existing tests for HR deficiency.

Patents: US provisional application filed.

Related Web Links: see publication: Clin Cancer Res (2023) 29 (13): 2466–2479.