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**Biomarker studies for personalized breast cancer care**

**Investigator(s):** Daniel Hayes, M.D.

**Lead Organization:** University of Michigan

**Grant Mechanism:** KS

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**Public Abstract:**

The study hypothesis and how it will be tested. Cancer cells spread from one site to another to develop "metastases," which are the main reason for cancer-related mortality. The main conduit for this spread is in the blood, and cancer cells that are found in the blood are called "circulating tumor cells" (CTC). CTC can be isolated and counted from the blood of patients with breast cancer using a commercially available device called "CellSearch." However, CellSearch has limitations, in that it doesn’t capture all of the CTC present in a tube of blood. We are developing new devices that permit capture of CTC that are not isolated by CellSearch so that we can further characterize them using molecular assays, and even grow them in culture to gain better understanding of the metastatic process.

- How successful completion of the project will uniquely advance our understanding of breast cancer and lead to reductions in incidence and/or mortality. These devices will permit isolation of CTC that CellSearch does not currently capture. Thus, we may be able to understand which CTC are most likely to lead to metastases and which ones do not, and to determine which markers (genetic or expression) are important to guide patient care.

- The importance of the research to patients with breast cancer. Understanding which patients are likely to suffer metastases, or death, will help us focus care on those who need it, and avoid over-treatment for those who do not. Furthermore, understanding the biomarkers that "drive" the cancer, and how they differ between the primary cancer and the metastases, will help better guide specific "targeted" therapies in the future. Thus, characterizing CTC may be the equivalent of a "liquid biopsy".