CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:
RP150632

Project Title:
Acetate may be a key substrate driving growth in early stage breast cancer in patients

Award Mechanism:
High Impact/High Risk

Principal Investigator:
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Entity:
The University of Texas Southwestern Medical Center

Lay Summary:

We have studied brain tumor metabolism, looking at both primary tumors such as glioblastoma and also metastatic tumors from breast, breast, kidney cancer and melanoma. We have identified fundamental properties of these diverse types of cancer that seem to have a common theme of needing to use additional fuel for tumor growth beyond sugar. We have shown in the brain tumors that they are able to use acetate as a fuel for growth and the current work is designed to determine whether this is a common feature of tumors adapting to the brain or a fundamental characteristic of tumors. We have chosen breast cancer so that we can study patients with early stage disease who have a wide variability in terms of the aggressiveness of the cancer. This will help us to understand better what the different stages of breast cancer (early stage vs later and end stage, like brain metastases) need in order to continue to grow. The finding that primary breast cancers use acetate as a fuel could be a major paradigm shift in cancer metabolism and could be profoundly important for considering therapies for early stage breast cancer. If the tumor is dependent on acetate to generate the building blocks of the cells that they need to divide and make new cells, it is possible that blocking this pathway could be lethal for the cell. Expertise in metabolic studies in patients at UTSW and approval of the IRB to administer 13C-labeled nutrients during surgical tumor resection provides a unique opportunity to study primary tumors and generate the basic information needed to carry the observations in brain tumors and preliminary findings in breast cancer forward into therapeutic development.