CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:
RP130425

Project Title:
Elucidating Mechanisms of Altered Lipid Metabolism in Cancer

Award Mechanism:
High Impact/High Risk

Principal Investigator:
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Entity:
The University of Texas Health Science Center at Houston

Lay Summary:

The objective of our proposal is to understand the mechanisms of aberrant lipid metabolism in cancer. One challenge in cancer treatment is how to kill only cancer without affecting normal cells. It is important to design methods that inhibit signaling pathways or cellular processes that alter in cancer cells. We propose experiments to understand how cancer cells respond to their needs by activating different lipid metabolic activity. Two aims are proposed. In Aim 1, we will examine the roles of Lipin1 in cancer pathogenesis. Lipin1 is a dual-function protein that invovles in both phospholipid synthesis and lipid oxidatin,. We plan to answer two questions: 1) what is the role of Lipin1 in lipid metabolism in cancer cells; 2) what is the difference between the Lipin1 complexes assembled for two opposite routes of lipid metabolism, the biosynthetic and bioenergetic pathways. The knowledge from this study will help us to design strategies to target lipid biosynthesis and oxidation simultaneously or individually. In Aim 2, we will identify novel lipid metabolism regulatory proteins using a new procedure developed in our laboratory, and examine how these proteins contribute to the altered lipid metabolism in cancer. The proteins identified from this screen will provide us new types of cancer therapeutic targets. Knowledge gained from this study will help us to better understand the dependence of cancers on their altered metabolic requirements and to design new therapeutic strategies.