



CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:
RP100400

Project Title:
Adipose progenitor cells as a new clinical cancer target

Award Mechanism:
High Impact/High Risk

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

Lay Summary:

Despite numerous therapeutic approaches aimed at tumor and vascular cells, resistance of cancer to treatment remains a challenge, indicating existence of unrecognized cell populations driving disease progression. Cancer progression is accelerated in obese patients due to mechanisms that are not well understood. Based on epidemiological association between cancer and obesity, we have accumulated original evidence that adipose tissue, which is overgrown in obese patients, promotes cancer progression by serving as a source of stromal progenitor cells. Our mouse transplantation studies show that adipose tissue-derived progenitor cells migrate to tumors, engraft and promote tumor growth. Here, we will test adipose progenitor cells as an experimental therapy target through an integrated platform approach based on our expertise in cancer models, stem cell isolation by flow cytometry, technology for combinatorial library screening, and pre-clinical validation of targeted therapeutic prototypes. We will (i) use mouse models to generate probes targeting surface markers of circulating adipose progenitor cells isolated through screening of phage-displayed combinatorial peptide libraries *in vivo*. We will then (ii) administer an adipose progenitor cell-targeting probe coupled with a pro-apoptotic moiety into cancer-bearing mice to establish an experimental approach to mobilized adipose progenitor cell cytoablation. This study will establish the role of endogenous adipose progenitor cells in cancer progression and test them as a potential therapeutic target. The proposed study will establish the role of circulating adipose stem cells in cancer progression and contribute to a fundamental understanding of tumor microenvironment organization. In the future, adipose stem cells may become useful as surrogate markers for cancer diagnosis or recurrence. We envision therapies aimed at adipose stem cells becoming a complementary cancer treatment.