Award ID:
RP120583

Project Title:
A New Functional Genomics Approach to Discovering Therapeutic Targets for Breast Cancer

Award Mechanism:
Individual Investigator

Principal Investigator:
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Entity:
Baylor College of Medicine

Lay Summary:

More than 40,000 women will lose their fight with breast cancer this year, underlining the urgent need for new therapies. A major bottleneck in developing new treatments is the slow pace in identifying effective drug targets. We need new, creative strategies for rapidly discovering the key vulnerabilities of human breast cancer. Our group has developed a strategy that may fundamentally change the speed in which new anti-cancer targets are discovered. This strategy is based on combining team-oriented science with a novel technology that we recently developed. Unlike traditional "one-gene-at-a-time" approaches, this new technology (termed "RNA interference library") enables us to rapidly test the functional role of all genes in human cancers. The major goal for any cancer therapy is to selectively kill tumor cells without detrimental effects on a person's normal cells and tissues. Implicit in this goal is the challenge that therapies must target vulnerabilities unique to cancer cells. Using our new technology, we are discovering the genes that breast cancer cells depend on for their aggressive behavior, but are not required by normal cells. In our pilot studies, we have already identified examples of such genes, and demonstrated that inhibiting these genes severely impairs breast cancer progression in animal models. This exciting finding suggests that an entire class of these "breast cancer vulnerabilities" awaits discovery. Our goal is to use support from the Nancy Owens Memorial Foundation to: (1) search the entire genome for these new genes that are "breast cancer vulnerabilities," (2) further test why breast cancers depend on these genes, and (3) validate these genes as new therapeutic targets for breast cancer. More broadly, the long-term goals of our research program are to develop a broadly applicable strategy for rapidly developing new therapies for many types of cancer.