



CANCER PREVENTION & RESEARCH  
INSTITUTE OF TEXAS

Award ID:  
RP100976

Project Title:  
Evaluating the therapeutic potential of a potent anti-cancer agent

Award Mechanism:  
Individual Investigator

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

Lay Summary:

Nature produces small molecules that profoundly benefit human health. Natural products can be produced by bacteria (e.g. doxorubicin), fungi (e.g. tetracyclins) or plants (e.g. paclitaxel). The treatment of cancer, in particular, has benefited from Nature's arsenal of small molecules. For this reason, newly discovered natural products present exciting opportunities for interdisciplinary research involving chemical and biological studies. In 2008 researchers identified a small molecule named nigriganoside which potently kills human cancer cells. Unfortunately, even after many years of effort, less than one milligram of the compound was found. The minute quantities isolated prohibited complete characterization of nigriganoside and a full evaluation of its therapeutic potential. As a first step towards developing nigriganoside as a therapeutic, we will determine its structure by preparing synthetic samples of various possible compounds. By comparing the physical and biological characteristics of our synthetic materials we should be able to determine the true structure of nigriganoside. Next, we will attempt to determine the mechanism by which nigriganoside kills human cancer cell lines. To this end, we will adopt two strategies: we will test a specific hypothesis that it interacts with thread-like polymers involved in cell division. Second, we will search for proteins that directly interact with the natural product. Finally, we will probe the utility of nigriganoside by observing its efficacy against various types of human cancers both in cell culture and in animal models.