



CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:
RP110786

Project Title:
Multiphoton Laser Scanning Microscope for Cancer Research and Drug
Discovery

Award Mechanism:
Shared Instrumentation Awards

Principal Investigator:
Smith, Quentin R

Entity:
Texas Tech University Health Sciences Center

Lay Summary:

This application seeks funding for a special new microscope which can image drugs and cancer cells in tissues of living organisms and can be used to explore mechanisms of cancer cell signaling and invasion within the body and to test new therapeutic drugs. Research projects within the grant fall into three areas. In the first, the microscope will be used to explore mechanisms of increased tumor cell invasiveness in isolated cells and in live animals. One of these mechanisms involves the RON receptor, which is a highly expressed protein in many tumors. RON is involved in signaling that turns on the ability of a cancer cell to spread to other tissues. The microscope will also be used to investigate special structures in cancer cells, called invadopodia, which are used by cancer cells to break out of their original tissue. In a second line of research, the microscope will be employed by a series of investigators to explore anticancer effects of drugs. The investigators, once demonstrating anticancer effects on tumor cells grown outside the body, will monitor the effects of the test agents on tumor cell function and survival in animals. Agents will be screened as well for preventive effects. Finally, in a third group of experiments, the microscope will be used to explore tumor cell invasion and disruption of the brain. The brain is one of the most difficult organs to treat in cancer, because once tumor cells have invaded the brain from other organs, they show very poor response to most therapeutic drugs. Researchers will use the microscope to explore mechanisms by which tumor cells invade the brain and investigate new means of getting drugs into brain to treat these tumors. The microscope will be supported and maintained by researchers and administration through an equipment core and a dedicated user oversight group.