CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:
RP110776

Project Title:
NIR/Visible/UV FACS for Molecular Medicine

Award Mechanism:
Shared Instrumentation Awards

Principal Investigator:
Sevick, Eva M

Entity:
The University of Texas Health Science Center at Houston

Lay Summary:

Cancer research involves unraveling the molecular mechanisms of how cancer cells arise, survive, and interact in order to discover new therapeutics and diagnostics. One research tool to identify specific cancer cell types within a larger population of non-cancerous cells is fluorescence activated cell sorting (FACS). FACS instruments work by individually passing millions of single cells across a laser beam and collecting the fluorescence that identifies the individual cell type for sorting. The sorted cells are of the same type and when collected, can then be analyzed further or even injected into animals to test whether these cells give rise to cancer. A cell type, such as a cancer stem cell, can have a number of different fluorescent features, requiring as many as 18 different "colors" of fluorescence in order to differentiate it for accurate sorting. Hence, multi-color FACS is a necessary tool for making and confirming cancer research discoveries. Very recently, new red fluorescent proteins have been discovered that can be genetically encoded within the DNA of cancer cells that once sorted and injected into animals, allow tracking of cancer cells and their progeny using pathology or new molecular imaging approaches. Other fluorescent imaging agents have been developed that once injected into the living being, can detect cancer cells using near-infrared light. These developments require laser light of red or near-infrared wavelengths which are not available on commercial FACS machines. In this shared instrumentation grant, we propose the purchase and supported use of a shared custom FACS sorter that will possess 18 colors for sorting and analyzing cell type. The instrument will uniquely enable "state-of-the-art" experiments that use new gene reporters and molecular imaging to accelerate cancer research discoveries not only in Texas, but across the US.