

Bankhead-Coley Cancer Research Program

Yeatman, Timothy

Department of Experimental Therapeutics

H. Lee Moffitt Cancer Center and Research Institute

*2006 Program
Shared Instrument Grant
(1-year project)*

Project Title: Proposal for the Acquisition of a BioBank -80°C Automated Storage System

Project Summary: This Shared Instrumentation Grant involves the purchase of a Thermo Electron BioBank -80° C Automated Sample Management System. Specifically, the BioBank is an ultra-low temperature automated freezer system designed to safely store biological samples at -80° C for future use in cancer-related research initiatives. The BioBank is ideal for storing a wide variety of biological sample libraries such as the long- and short-term storage of tissues as proposed in this submission. The key to the BioBank's storage capabilities is the robust robotics technology that allows for selective retrieval of samples of interest, while leaving unneeded samples in a safely undisturbed, ultra-low temperature state. This important function is vital in preserving the biological function and properties during long-term storage of samples. Many studies have demonstrated that repeated, sudden changes in temperatures over time drastically reduce the long-term viability of biological materials. These changes are common when standard -80°C freezers are used for storage because in order to retrieve a single sample, the freezer door must be completely opened, resulting in a sudden increase in freezer temperature. Depending on the time needed to locate a particular sample among the thousands of stored samples, the temperature can rise up to 20-30°C. It takes approximately 2 hours for temperature to be restored to its -80°C state, and continued opening and closing of freezer doors thwart any attempt at a consistent -80°C environment. Repeated thermal fluctuations like this directly impact the science performed on these samples and ultimately eliminate their usefulness. The BioBank removes these concerns by maintaining samples at a constant -80°C temperature and utilizes robotics to retrieve only samples of interest. The Moffitt Cancer Center is delivering new technologies to cancer patients throughout Florida with an initiative entitled Total Cancer Care (TCC). TCC will soon enable researchers at Moffitt to create personalized cancer treatments and deliver them through a network of community hospitals. TCC is a large-scale clinical research protocol that is supported by a state-of-the-art technology platform. The research plan is to store thousands of tissue and blood samples from cancer patients around the state at Moffitt's central Biorepository. Moffitt investigators can then use these collected samples to investigate the genetic profiles, or "fingerprints," of these tumors. New clinical trials can then be developed to test the efficacy of specific drugs on patients with known tumor characteristics. Eventually, doctors will be able to prospectively match a patient's tumor with the most appropriate drug. The data will also be used to analyze treatment patterns, identify variables in cancer practice, and develop evidence-based guidelines for cancer diagnosis, treatment, and prevention. Similarly, the Lifetime Cancer Screening (LCS) and Prevention Center at the HLMCC&RI will open an IRB-approved research protocol to amass a large collection of clinical samples from healthy, cancer-free patients. This clinical population will provide an invaluable source of healthy controls for future studies by collecting and storing consented patient's DNA, serum, and urine samples. Taken together, LCS and TCC protocols will

Bankhead-Coley Cancer Research Program

have a profound impact in the prevention and cure of cancer by enabling a new information platform to communicate the latest cancer diagnosis, treatment, and prevention information to cancer and health care providers across the state. The BioBank storage system is a vital component to the success of these two protocols because it allows for unmatched storage conditions to preserve sample integrity and enables first-class research through high-quality samples.