Cancer Care Engineering

INITIATIVE

CCE is an innovative, interdisciplinary, multi-institutional project that holds great promise for advancing the translation of cancer research to impact clinical care. The initial phase of the CCE project focuses on colorectal cancer and since sample collection was launched in April 2009, tissue and blood samples have been collected from 523 healthy, polyp-bearing and cancer patients. The samples undergo multiple discrete molecular analyses in multiple laboratories at Purdue, Indiana University and the MD Anderson Cancer Center. The resulting massive datasets along with extensive sample annotation and lifestyle data are stored in a cloud computing environment built to enable the CCE project and support the necessary complex data integration that the project requires. This cyberinfrastructure (cceHUB) is based on Purdue’s innovative HUBzeroTM technology, where stored data can be queried, mined, modeled and uniquely visualized in a single, easily accessible environment. The hub provides instant access to all data for all CCE investigators and enables rapid communication among the clinicians, scientists, statisticians, mathematicians, engineers and staff that compose the CCE team. The CCE goal is to develop novel screening and risk assessment tools to prevent cancer and decision making tools to personalize cancer therapy for optimal response.

IMPACT

- Extensive protocols to collect, differentially process, annotate, store and distribute to multiple laboratories, human samples for multiple molecular and analytical analyses.
- Extensive cyberinfrastructure to track clinical samples and store clinical, lifestyle, exposure, diet and analytical data.
- Mathematical modeling tools to analyze queried datasets.
- More than 500 normal, polyp-bearing, and cancer patients enrolled.
- Our goal is to enroll 100 additional patients by 2015.
- First CCE non-academic clinical site (IU Health Arnett, Lafayette).
- First local cancer research advocate program to support CCE project in Lafayette.

The CCE project is led by the Oncological Sciences Center in Discovery Park and the IU Melvin and Bren Simon Cancer Center, and includes the University of Notre Dame, the MD Anderson Cancer Center and the Roudebush VA. The CCE project is funded by the NIH, Department of Defense, the Regenstrief Foundation and the Walther Cancer Foundation.