

## Bankhead-Coley Cancer Research Program

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*2011 Program  
Bridge  
(1 year project)*

**Project Title:** Replication Profiling as a Diagnostic Tool in B-cell Acute Lymphoblastic Leukemia

**Project Summary:** We propose to explore a novel source of cancer biomarkers—the temporal order in which segments of chromosome are replicated (“replication timing”)—that has great potential impact in identifying good and poor risk patients and further personalizing therapeutic approaches to cancer. Abnormal replication timing has been anecdotally associated with many cancers, but no systematic evaluation of its potential to serve as a source of biomarkers has been performed. We will focus on B-cell Acute Lymphocytic Leukemia (ALL) as a model cancer. Not only is ALL the most common form of childhood cancer, but the characterization of several genetic subtypes and the availability of relatively homogeneous cancer tissue from patients make ALL a good model in which to explore novel biomarkers. Our hypothesis is that replication timing will be different in different subtypes of ALL and that these differences can be exploited for therapy as well as to improve clinical outcome. We have developed a rapid and simple way to measure replication timing and have identified unique patterns in a handful of patient samples. Our proposed objective is to acquire sufficient samples to demonstrate feasibility and construct an analytical plan that will warrant a federally funded study to link these markers to patient outcome. This is a unique approach that may open the door to an entirely novel avenue in the development of cancer biomarkers.