

# NeoTREX™

A division of CSU Ventures, Inc.,  
an affiliate of Colorado State University.



## A Biomarker Assay Utilizing Telomere Dysfunction to Evaluate Risk of Developing Breast Cancer

Drs. Susan Bailey and Bob Ullrich of Colorado State University have developed a diagnostic assay to identify telomere dysfunction, which can serve as a sensitive biomarker for genomic instability.

Chromosomes are capped by telomeres, repetitive DNA sequences associated with a variety of proteins that act together to protect the ends of the chromosomes from loss, recombination and/or fusion. Fluorescence in situ hybridization (FISH) with probes complementary to telomeric DNA allows visualization of telomeres, which are normally found only at chromosome ends. Therefore, the presence of inappropriate interstitial telomeric sequences (ITS) along the length of the chromosome, particularly after exposure to ionizing radiation (breaks chromosomal DNA; makes double-strand breaks), provides a definitive indication of telomere dysfunction and instability.

Based on their relevant research, these researchers have discovered a link between this specific type of telomere dysfunction and individual susceptibility to breast cancer (Williams E.S. et al., *Cancer Research* 2009). The biomarker assay they've developed provides a platform to detect telomere dysfunction (observed as ITS; see image below), which can result from underlying gene mutation and/or generation of radiation-induced genomic instability. Since no specific cause of telomere dysfunction is selected or targeted, the assay also provides an effective screening tool.

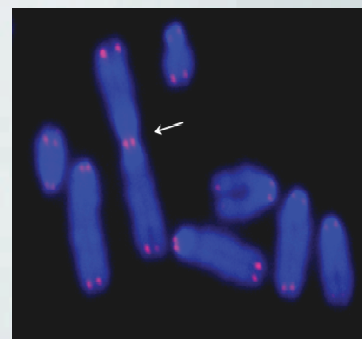
Furthermore, the biomarker assay is straightforward and cost effective, making use of standard FISH technology and existing equipment such as a fluorescence microscope; it does not require PCR machines, sequencing devices or microarray capabilities. Likewise, the assay can be performed in conjunction with other cytogenetic tests, so requires little to no additional sample collection and requires little additional training.

**ID: CSURF 09-056**

### Inventor Information

Dr. Susan Bailey

Dr. Robert Ullrich



### Contact Information:

Steve Foster

Phone: 970.297.1276

Email: [steve@neotrex.org](mailto:steve@neotrex.org)

[www.neotrex.org](http://www.neotrex.org)

Colorado  
State  
University